

Semantic Web Use Case

An application for sustainable tourism development

Keywords:

Semantic Web, Semantic Knowledge, Ontology, Tourism, Knowledge Management, Thesaurus

Author:

Jean Delahousse

Mondeca

Paris

France

jean.delahousse@mondeca.com

<http://www.mondeca.com>

Biography

Jean Delahousse, born in 1958, graduated from ESCP (France). Jean is an expert in the semantic content management, metadata management, Semantic Web. He worked for Andersen Consulting, the Paris Stock Exchange and Diagram (a financial software company). He created BDB, a financial software company, in 1993. Since 1999, he has been CEO and co-founder of MONDECA, a software company dedicated to content organization and semantic knowledge solutions based ontology . Jean Delahousse has a wide experience of software design and marketing. He was one of the cofounders of the XTM authoring group and belongs to the board of XML France. Merging knowledge engineering, graph theory and XML knowledge representation standards into useful tools for end-users within the enterprise is his main concern today. He has given several invited talks in international meetings.

Abstract

First applications of Semantic Web technology arrives in industry. We'll illustrate the very rich features and benefits of Semantic Web technologies with a case in the tourism industry: the "Tourism Virtual House".

This project, driven by the French company: Visio-Lab is both an ongoing IST project "Hi-Touch" with participation of several European region, but also a commercial offer with first applications.

The project is a perfect user case:

- As it was not conceive at first as a semantic web project but more as a pure marketing web application with the aim to have solution for sustainable tourism development at the European regional and local level,

- As tourism industry is the most important commercial activity directly existing on the web.

We'll illustrate how operational needs lead to use semantic web technology and concepts and how they were related to project constraints and tourism industry existing terminology.

This use case will illustrate several aspects of semantic knowledge project:

- methodology
- choice of standards
- ontology and industry vocabulary
- use of linguistic solutions
- system architecture
- Business model...

Summary

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Project aims and general context: access to local tourism resources

Tourism industry represents 11% of European PIB and 38% of e-business on the web.

Tourism offer made be sharply segregated between:

- large industrial operator (UK, Germany) distributing tourism packages using tourism agency but also Web portal
- local tourism offer directly market by producers (hotel, museum, restaurants...) or federated by public organization on a regional level

Large tourism operator have use web technology and marketing techniques using a centralized information system linked to in-house reservation systems but also systems such as Amadeus or Sabre.

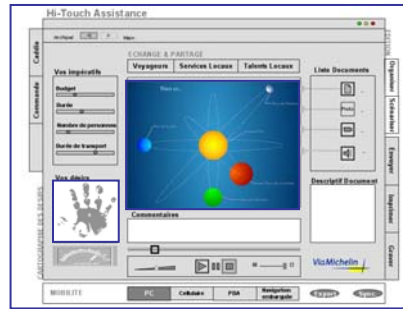
Local tourism producers have also a presence on the web with simple or beautiful web site used as an electronic brochure. Their dialogs with prospects use more and more web and email technology. They also are careful to reference their web site in regional portals or to give content to centralized tourism repositories.

If both offers are present on the web, their visibility to users is very different:

- professional tourism operator have to promote one brand referring to a single web site where a unique catalogue software manipulates a limited number of pre-structured packages. Financial resources and limited amount of offers enables professional to present multilingual catalogs to adapt to European users.
- local tourism producer present thousands of offers elementary offers, no pre-defined packages, multiple user interfaces, connection to various reservation systems. Users having a lot of difficulty to build vacations with what they find on the web.

The object of Visio-Lab, backup by regional tourism organisations, is to offer on local, regional level solutions to enable local tourism offer to be as visible as tourism industrial operators, but also solutions enabling users to build personalised packages depending on their aspirations, needs. In one world the project has the aim to enable a sustainable local tourism to survive and develop on the side of more industrial offer.

POUR LE CONSOMMATEUR



LA CONSOLE HI-TOUCH

*Mise en place
d'un service
Hi-Touch
Assistance*

POUR LE TERRITOIRE

- Services locaux,
- Talents locaux,
- Prestataires.



LA MAISON VIRTUELLE DU
TOURISME

*Mise en place
d'un service
Hi-Touch
Assistance*

Project context and constraints

Describing the objectives we understand most of the constraints:

- a distributed environment made of thousands of local producers (on a regional scale for example)
- a heterogeneous offer which value is in its originality and specificity
- multilingual, multi profiles users coming from all over Europe and other continents
- a need from the user to be helped to build tourism package with local offer

On the other hand Tourism industry is before the finance industry the pioneer of numeric exchanges. A long tradition of numeric exchanges between the different actors of the industry (transportation, housing, tour operator...) enabled the emergence of a standardized vocabulary long before meta tagging and semantic web projects.

Project concepts

The project concepts were not driven technical implementation choices but by the promoter of the project who are local tourism resources development professionals. They are the following:

- tourism resources description and their web publication has to remain under control of the tourism producers (as for paper brochures, and against all project of centralisation of tourism resources description)
- tourism resources should be described using a common root of multilingual terminology at least for the object classification level
- tourism resources should also be described with “psycho-sociological” terminology to enable profiling of the offer depending on users expressed wishes
- user interface is a critical component to access to “virtual house of tourism”

- local and regional public actors of tourism are the mortar of those projects and should be the managers of the virtual house of tourism in continuity to their actual marketing activity to promote the region
- local tourism develop in close relation with cultural patrimony and events
-

Project components

Mondeca and our semantic web technology arrived at the beginning of the project, because of a shared relationship working on sustainable development projects.

A first and difficult part of the project was to convince the leaders of the project of the added value of semantic web technology for their project.

The various technical and methodological components have been chosen during a full year process of discussion, confrontation to several unsolved question, evolution or Mondeca approach, availability of standards and tools.

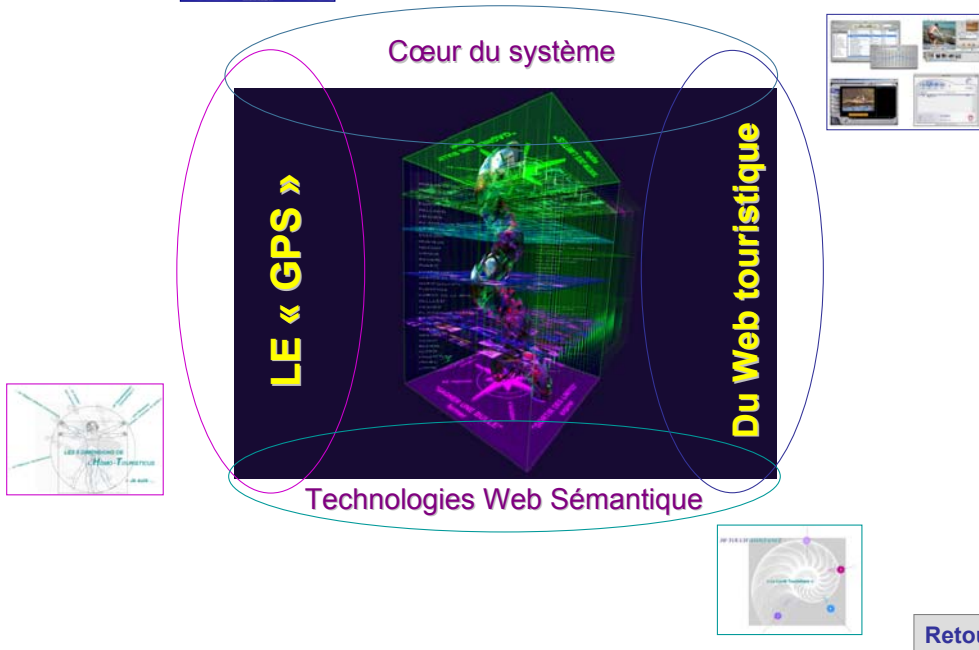
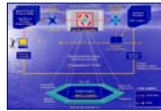
Choice of components to answer each project need

Semantic knowledge repository

The first component promoted by Mondeca is a semantic knowledge repository enabling to build a layer of tourism resources description above the distributed content.

The solution is built on an intranet semantic knowledge repository used by tourism actors to describe

- Identification and categorisation of tourism objects
- Several layers of semantic links between tourism objects:
 - o localization
 - o linked services
 - o Economical relationships (same owner...)
 - o Historical / cultural relationships



[Retour](#)

Base connaissance

Chateau de Chenonceau     CHATEAU

CHATEAU, PATRIMOINE CULTUREL, PATRIMOINE TOURISTIQUE

Définition : Construit sur le Cher, dont les « eaux reflètent la beauté unique de son architecture Renaissance, le Château de Chenonceaux est le fleuron du Val de Loire. « Château des Dames » pour l'histoire de France, bâti en 1513 par Katherine Briconnet, embelli successivement par Diane de Poitiers et Catherine de Médicis, sauvé des rigueurs de la Révolution par Madame Dupin, Chenonceaux doit en effet aux femmes une part de son charme. Le site enchanteur, les Jardins à la Française, et le Parc qui l'entourent, complètent l'impression de grâce délicate qui s'en dégage. Chenonceaux n'est pas seulement remarquable par son architecture et son histoire, mais aussi par la richesse de ses collections, comme le révèle la visite intérieure : mobilier Renaissance, important ensemble de tapisseries des XV^e et XVII^e siècles et nombreux tableaux de Maîtres. Parmi les plus célèbres : Le Primatice, le Corrège, Rubens, Le Tintoret, Rigaud, Nattier, Van Loo.

Commentaire : recommandation [4/30/2003 by Jean Delahousse] Un site que nous recommandons. La beauté du chateau, le coté vivant de la décoration et des aménagements, la rapidité de la visite en font un lieu de choix pour découvrir les chateaux de la Loire.

Publications : [Ma publi. voyage EDF sept](#)

[services locaux](#) [voisinage](#) [tout/partie](#) [offre produit](#) [prestation de...](#) [similarité](#) [relation hist...](#) [localisation](#)

relation historique

lieu de référence **Chateau de Chenonceau**

personnage Catherine de Médicis, Henri II, Diane de Poitiers, Montgomery

document (3)

1 - 3 of 3 sort by Name

Name	Class	Created by	Created the	Begins	Ends
 Histoire de Chenonceau	GUIDE TOURISTIQUE	Gilles Delaporte	03/09/2003		

Content indexation and thesaurus

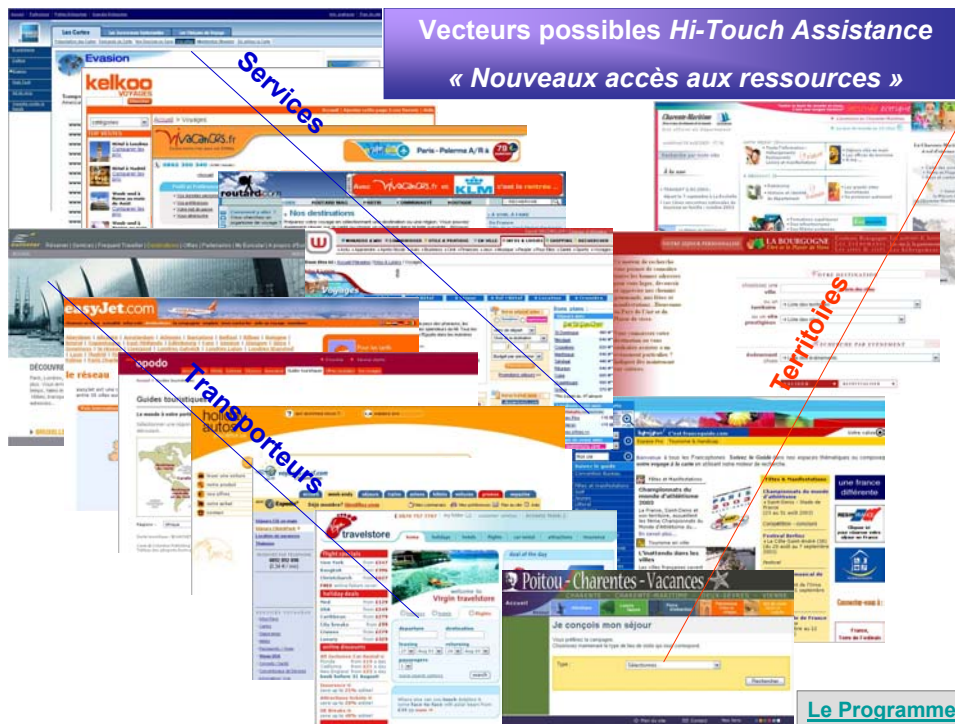
Tourism knowledge repository describes tourism resources with their identification and semantic relationships, but is mainly a place to federate descriptive multimedia content of the offer (brochures, price lists, maps, pictures, video, sounds...). Tourism industry has a long tradition of editing paper documentation on the offer and numeric version of this content should be aggregated by the knowledge base.

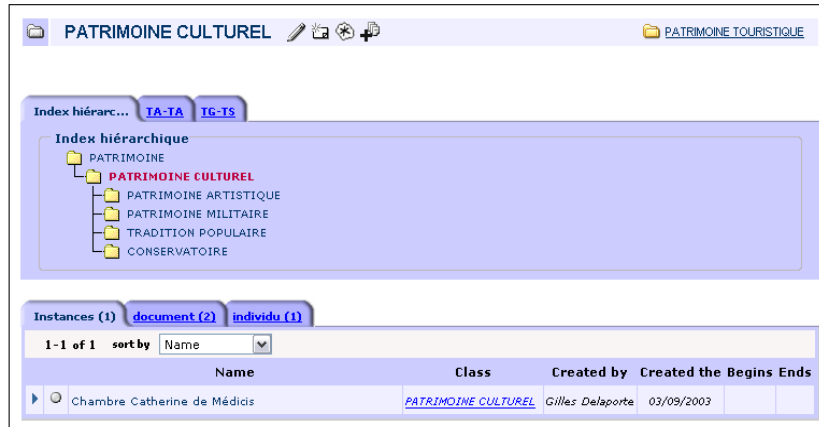
The need was here to find a way to index both that documentation on the tourism objects described in the knowledge repository but also to be able to index that multimedia content with key words, enabling semantic query the content.

Tourism industry has built over the 10 last years a multilingual thesaurus. Today this thesaurus is managed by the World Tourism Organization (WTO).

It has been decided to build integrate the thesaurus in the solution to have a full interoperable terminology for metadata keyword.

Dublin Core metadata standard has been chosen at the same time to describe metadata over content. As content publishing is distributed and uncontrolled, it was chosen to manage content metadata outside of document themselves that couldn't be modify but rather as an external rdf file published on the web and in the knowledge repository using a Dublin Core ontology model to describe metadata classes and available attributes in the knowledge base (proper names of tourism object, author, editors...) and in the thesaurus for tourism concepts.





PATRIMOINE CULTUREL PATRIMOINE TOURISTIQUE

Index hiérarc... **TA-TA** **TG-TS**

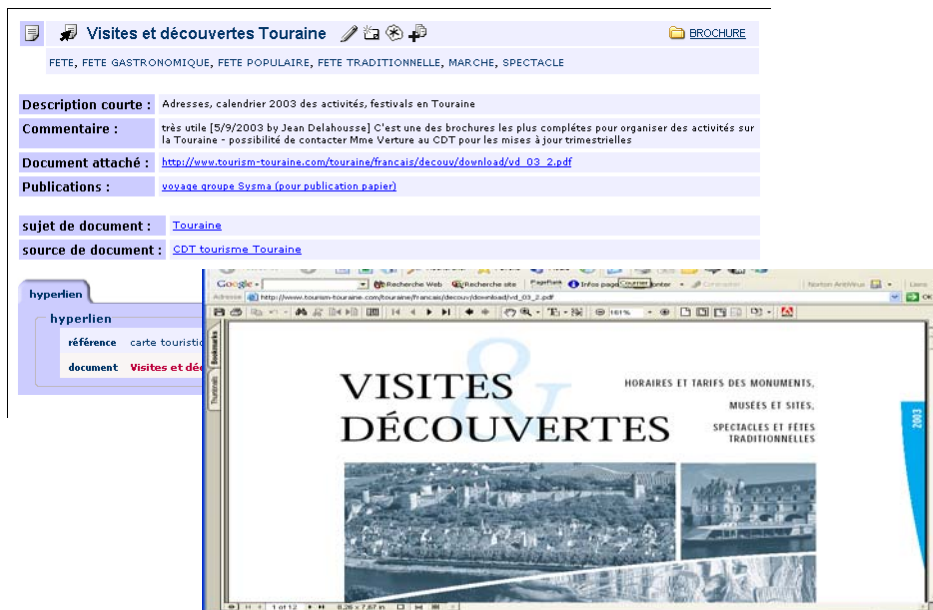
Index hiérarchique

- PATRIMOINE
 - PATRIMOINE CULTUREL**
 - PATRIMOINE ARTISTIQUE
 - PATRIMOINE MILITAIRE
 - TRADITION POPULAIRE
 - CONSERVATOIRE

Instances (1) **document (2)** **individu (1)**

1-1 of 1 **sort by** Name

Name	Class	Created by	Created the	Begins	Ends
▶ Chambre Catherine de Médicis	PATRIMOINE CULTUREL	Gilles Delaporte	03/09/2003		



Visites et découvertes Touraine BROCHURE

FETE, FETE GASTRONOMIQUE, FETE POPULAIRE, FETE TRADITIONNELLE, MARCHÉ, SPECTACLE

Description courte : Adresses, calendrier 2003 des activités, festivals en Touraine

Commentaire : très utile [5/9/2003 by Jean Delahousse] C'est une des brochures les plus complètes pour organiser des activités sur la Touraine - possibilité de contacter Mme Versure au CDT pour les mises à jour trimestrielles

Document attaché : http://www.tourism-touraine.com/touraine/francais/decouv/download/vd_03_2.pdf

Publications : [voyage groupe Sysma \(pour publication papier\)](#)

sujet de document : [Touraine](#)

source de document : [CDT tourisme Touraine](#)

hyperlien

- hyperlien
- référence carte touristi
- document **Visites et dé**

Google Chrome browser showing a preview of the brochure 'VISITES DÉCOUVERTES' for 2003. The brochure includes 'HORAIRES ET TARIFS DES MONUMENTS, MUSEES ET SITES, SPECTACLES ET FETES TRADITIONNELLES' and features images of historical sites in the Touraine region.

Profiling tourism simple and complex objects

As we have described, the first aim of the project is to be able to present tourism package and objects depending on user aspiration and needs. To do so, tourism package, should be characterized. The result of the marketing work on profiling needs ask for a multidimensional qualification of tourism objects and package.

Terms describing the various state in each dimension had been defined and tested with users. Those terms had to be used to index tourism objects and packages.

Project ontology

First version of the ontology was build very early, mainly to classify tourism object of the knowledge repository.

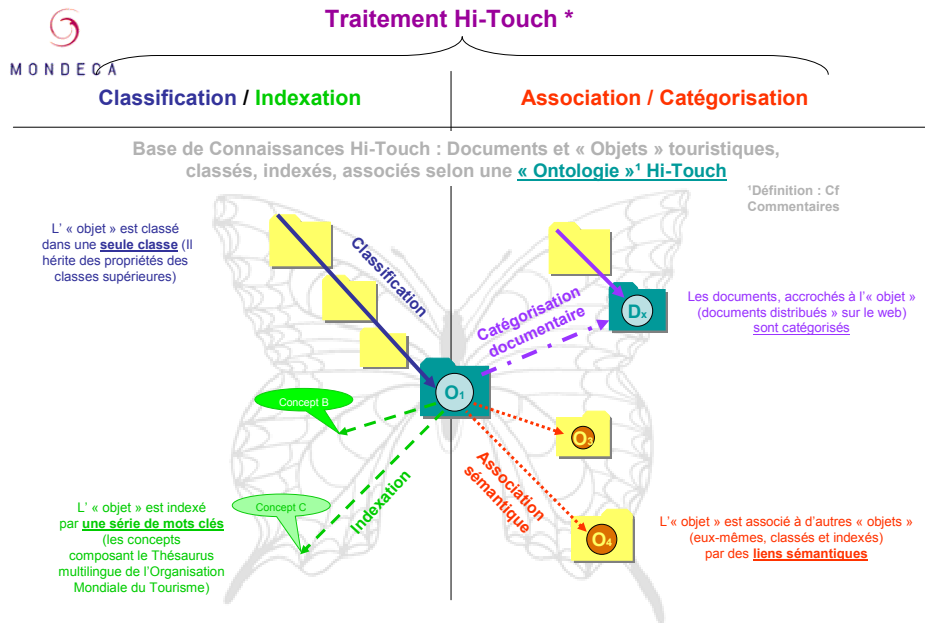
At this point was decided to build it again trying to handle the various types of object manipulated:

- tourism concepts from the WTO thesaurus
- terms describing the various dimension used for tourism object profiling
- tourism and cultural objects (place, museum, restaurant, housing, transportation, events....)
- tourism packages
- tourism multimedia content

But also the richness of semantic relationships between those objects :

- thesaurus relationships
- tourism and culture relationships
- relationships needed to organise tourism package
- Dublin Core metadata organisation





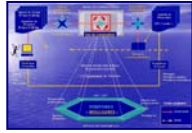
* Structuration, enrichissement & qualification de l'Offre

[Restitution](#)

Semantic services

The general semantic architecture has been decided both to answer needs of tourism representation but mainly to provide services to three main class of users :

- end user trying to build their vacations
- professional tourism operator (private or public) in charge of the “virtual house of tourism”
- tourism producers trying to referenced their offer at the virtual house of tourism



Personnalisation & Enrichissement des Offres

Dialogue avec les Territoires d'Accueil E-Organisés

Cartographie des désirs



Gestion Multimédia

Gestion des terminaux
Dans les différentes phases du cycle touristique



Semantic services for tourism producer

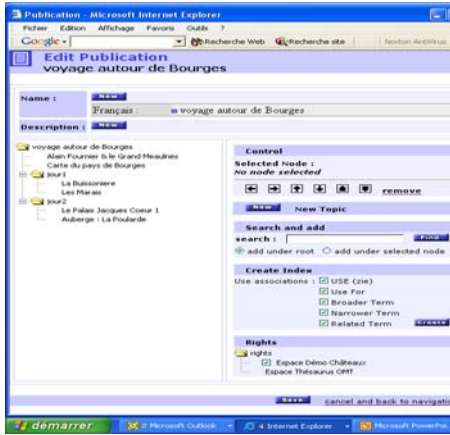


Acquisition automatique de connaissances
Indexation automatique contenu

NLP Extraction	
when	On Monday
who3b	Amgen
Announcement	announced
Rumor	intention
Competitive	
Intelligence buying	acquire
acquisition	
whom	Immunex
financial operation	for \$16 billion

Semantic services for virtual house of tourism professionals

Publier, diffuser



Edition XML
 Edition PDF
 Edition HTML

Semantic services for end users

Recherche d'un Objet

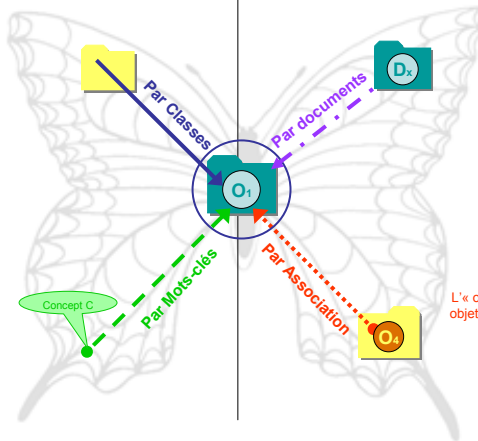
Requête texte / Requête assistée

Navigation-Surf

La Recherche sur la Base de Connaissances peut se faire, par mots-clés du thésaurus, par classes de la classification, par type d'association, par documents ou en combinant les 4 modes.

L'« objet » ayant été classé dans une **seule** classe (il a hérité des propriétés des classes supérieures)

L'« objet » ayant été indexé par une **série** de mots clés (les concepts composant le Thésaurus multilingue)



L'« objet » ayant été associé à des documents catégorisés, (« distribués » sur le web)

L'« objet » ayant été associé à d'autres « objets » (eux-mêmes, classés et indexés) par des **liens sémantiques**

Query sémantique

Search for topics :

Containing : Search names only

With any class

With class :

- Accueil
 - Document
 - Publications
 - Sujet
 - Catégorie
 - Individu
 - PROFESSIONNEL DU TOURISME
 - PRODUIT TOURISTIQUE
 - EVENEMENT
 - INFRASTRUCTURE
 - PATRIMOINE
 - PERSONNE
 - RESSOURCE LOCALE
 - SERVICE
 - UNITE GEOGRAPHIQUE

Related to any topic

Related to : *Chateau de Chenonceau*

In any association

In associations of type






With any roles

with topics searched as

and *Chateau de Chenonceau* as

What we have learned & yet unsolved points

ITM Mise en oeuvre

<p>1</p> <p>Modélisation Ontologie</p>	<ul style="list-style-type: none"> • Ontologie <input checked="" type="checkbox"/> objets <input checked="" type="checkbox"/> relations <input checked="" type="checkbox"/> attributs <input checked="" type="checkbox"/> contraintes sur les relations 	 <p>Outil Protégé</p>	<p>Modèle Ontologie</p> 
<p>2</p> <p>Référentiel métier</p>	<ul style="list-style-type: none"> • Concepts <input checked="" type="checkbox"/> Thésaurus multilingues Organisation Mondiale du Tourisme <input checked="" type="checkbox"/> Vocabulaire pour indexation psychosociologique de l'offre 		<p>Imports fichiers</p> 
<p>3</p> <p>Peuplement Sujets locaux Bases connaissances</p>	<ul style="list-style-type: none"> • Administration <input checked="" type="checkbox"/> Espaces, droits, profils <input checked="" type="checkbox"/> Description ressources locales 		<p>Reprise</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Base de données <input checked="" type="checkbox"/> Outils des syndicats d'initiative <input checked="" type="checkbox"/> Contenu éditeurs spécialisés