Functionalities and Flow Analyses of Knowledge Oriented Web Portals

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Introduction and objectives

- The concept of knowledge starts from the individual, from his critical analysis and on how one interacts with people and objects around him

- The ICTs, that play the most relevant role in this area of interest, are the Social Networks (SNs) and the Best Practice Networks (BPNs)

- Our aim is to study a new model to make a comparison among the most diffused SNs and the BPNs, that we are developing

- The model takes into account both the functionalities available on the portals and the treatment of the knowledge

Knowledge Management & SECI Model

- Nonaka & Takeuchi Model, based on:
  - 2 types of knowledge:
    - Explicit: is a formal, systematic language that can be expressed and shared in the form of data, in manuals, …
    - Tacit: is in the human mind, is personal and hard to formalize
  - 4 modes of knowledge conversion:
    - Socialization (from tacit to tacit)
    - Externalisation (from tacit to explicit)
    - Combination (from explicit to explicit)
    - Internalization (from explicit to tacit)
  - the spiral process:
    - the knowledge is transformed through exchanges among individuals and groups across the four modes of knowledge conversion and does not stop but continues into a new knowledge-creating spiral
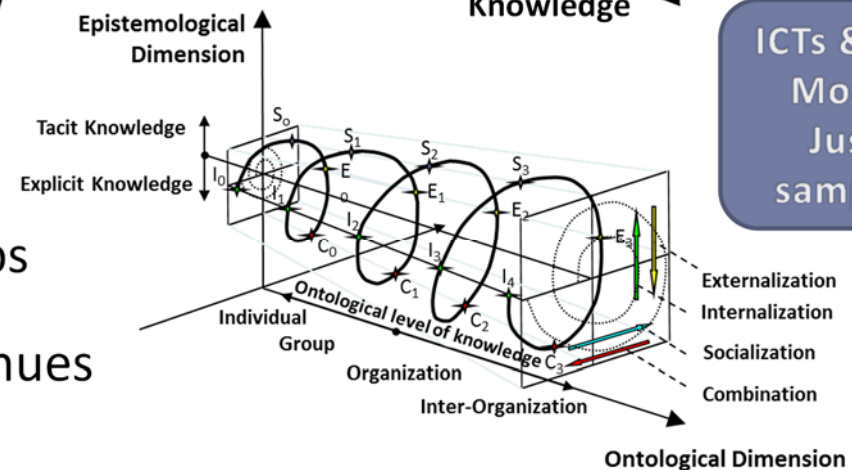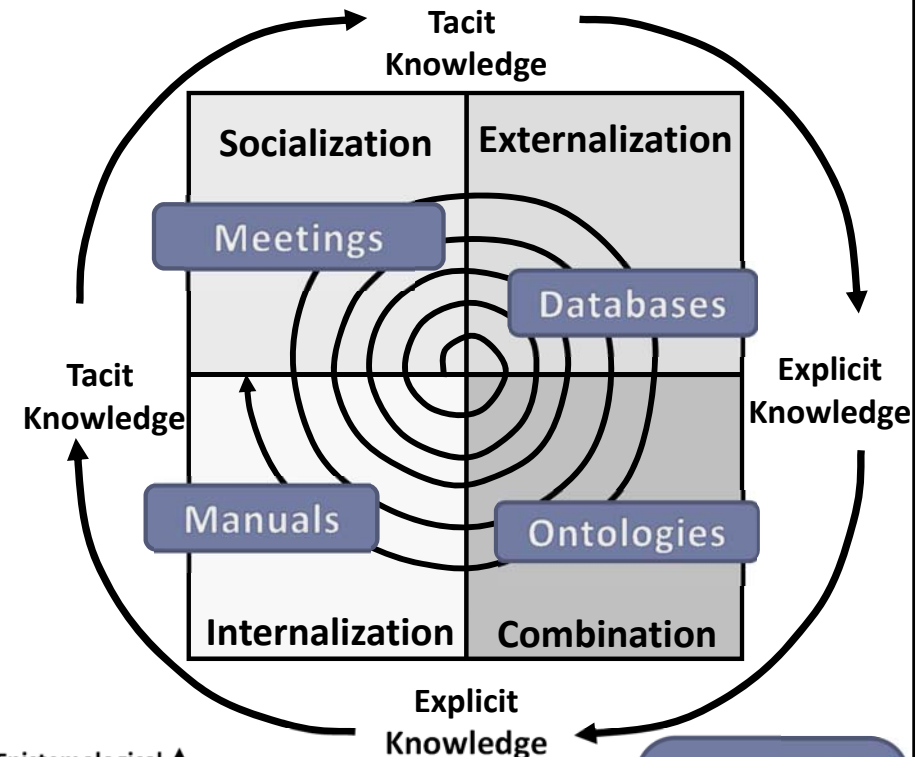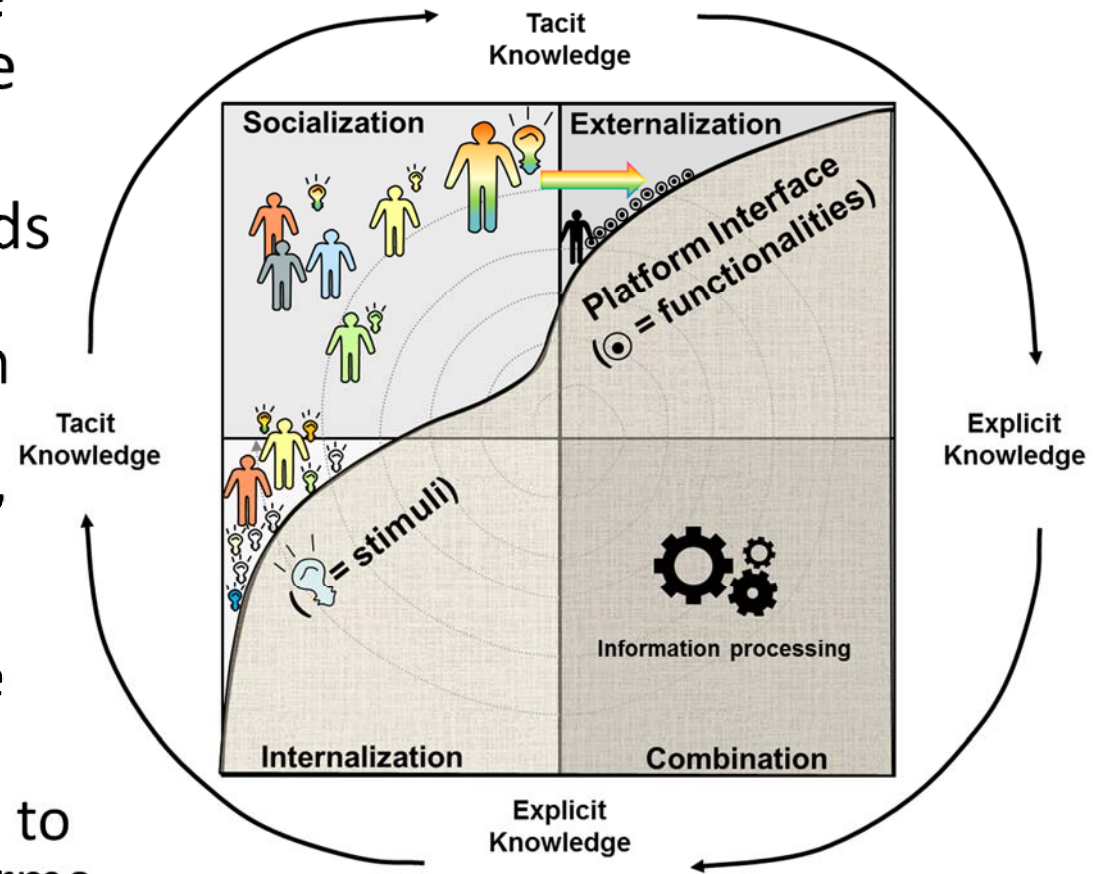
Functionalities & Flows of Knowledge in a Social Platform

- A Flow of knowledge is composed of a set of actions made by the users on the platform or by the platform itself

- Each action (flow) starts and ends in one of the four SECI model modes of knowledge conversion

- Analyzing the Social Portal functionalities and the actions' users:

  - 4 different types of flows can be identified

  - Studying these flows, it possible to establish when the Social Platforms play an important role to **produce new knowledge**
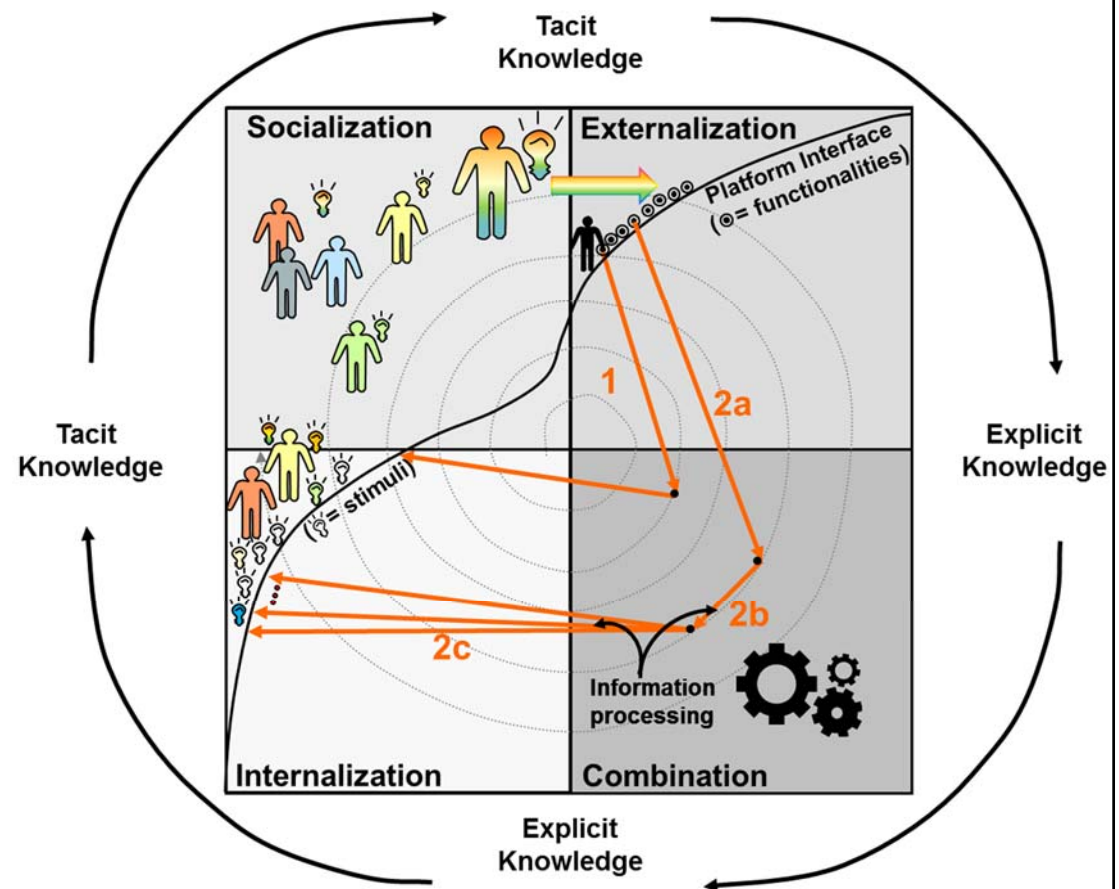
Functionalities & Flows of Knowledge in a Social Platform

- **(1) Direct flow**:
  - actions carried out by users and addressed to other users of the platform, with a little work (in terms of knowledge-reprocessing transformation) made by the platform itself:
    - make a comment on a content
    - add a new friend
    - send a personal message
- **In this case the Portal itself does NOT generates new knowledge**

Functionalities & Flows of Knowledge in a Social Platform

- **(2) Mediated flow**:
  - **2a)** actions in which the users put their knowledge on the Platform:
    - upload a content
    - fill the user profile
    - rank a content
  - **2b)** the platform make analysis and elaborations of the user's actions
  - **2c)** production of stimuli for the end users:
    - recommendations
    - suggestions
- **In this case the Portal itself generates new knowledge**

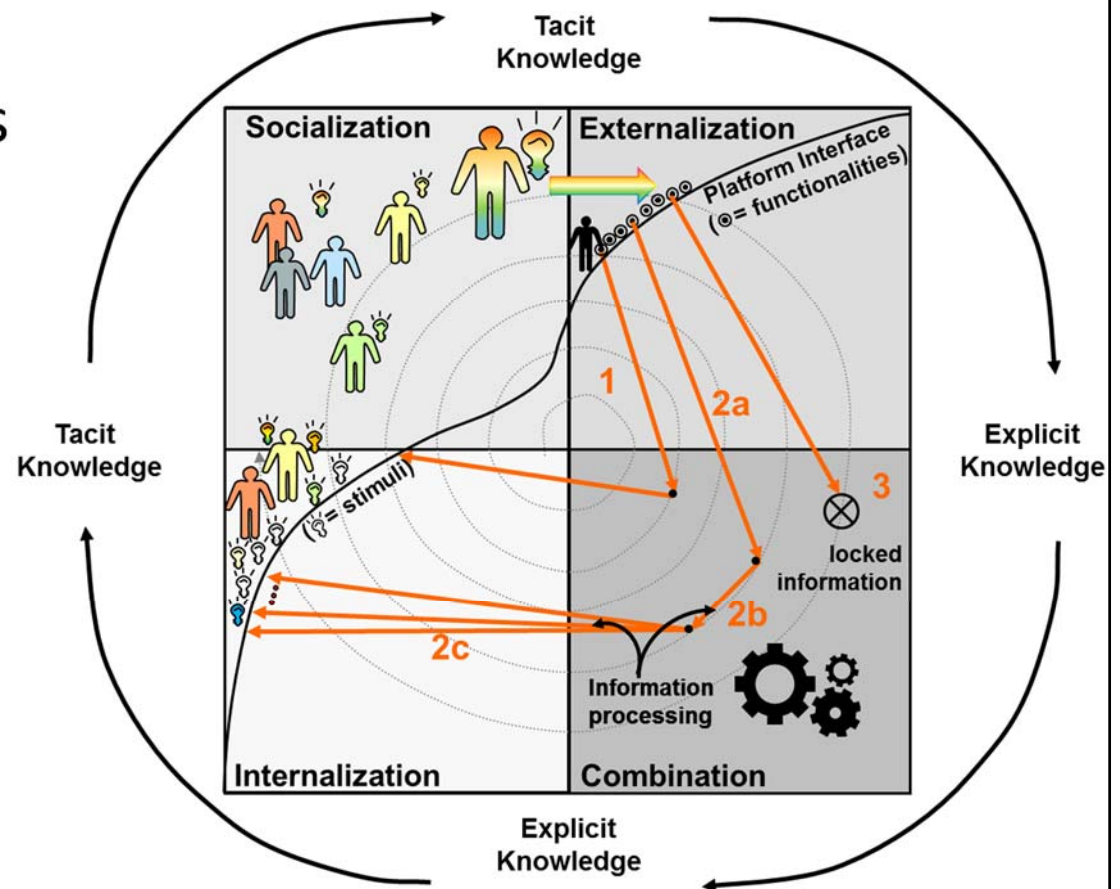# Functionalities & Flows of Knowledge in a Social Platform

- **3) Locked flow:**

  - users put their knowledge in the platform or make actions on it

  - AND the platform does not register the information given, with a consequent LOSS of information

- **In this case the Portal itself does NOT generates new knowledge**

# Functionalities & Flows of Knowledge in a Social Platform

4) Platform flow:

- Actions automatically offered by the platform to the users. Functionalities that do not depend on the user's actions or on the knowledge that they have put in the platform. Such as give the possibility to:
  - upload content
  - make queries on content
  - search new friends

In this case the Portal itself generates new knowledge
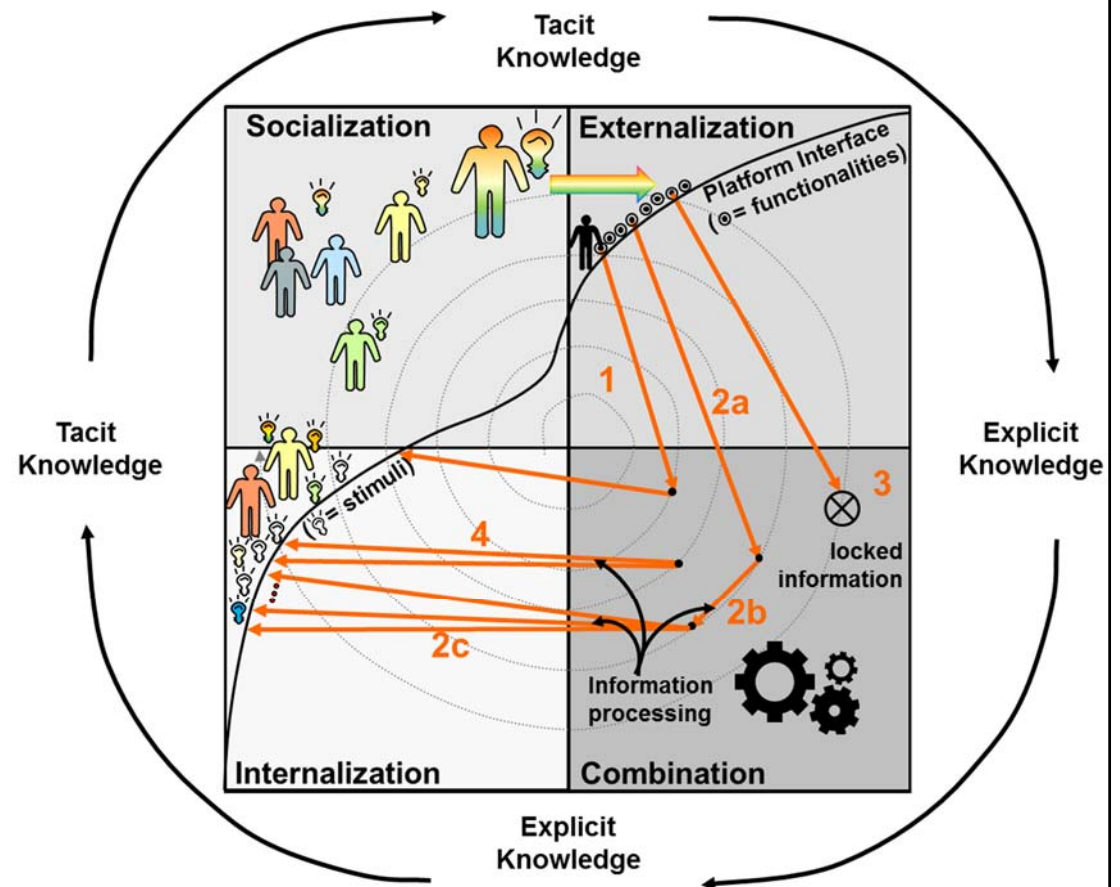
Analyzing functionalities and flow of knowledge

☐ **Action:** Write a public web page

Knowledge flow type: Direct flow (**1**)

- ◘ Start: the user starts from its own knowledge (tacit), uses editing tools and creates a web page on the platform (explicit). So the passage of knowledge is from tacit to explicit: T→E

- ◘ Result: this is the result of the user action. The user has produced a Web page, visible to all the users of the platform (explicit); the users can read it and get information (tacit): E→T

Functionalities and flows of knowledge					
	Start		flow	End	
	Kind of user	Action	Type	Result of the action	Kind of user
Write a Public Web Page	Platform	T→E EXTERNALIZATION	(1)	E→T INTERNALIZATION	All users

Analyzing functionalities and flow of knowledge

☐ **Action:** Suggestions to registered users

Knowledge flow type: Mediated flow (**2**)

- ▫ Start: the platform produces and offers to the user a list of recommendations (explicit), taking into account the previous user actions or his preferences expressed on the User Profile and the user sees them. In this case the knowledge flow is from explicit to explicit: E→E

- ▫ Result: the user reads the recommendations (explicit), acquires and reworks the information provided by the platform (tacit): E→T

Functionalities and flows of knowledge					
	Start		flow	End	
	Kind of user	Action	type	Result of the action	Kind of user
Suggestions to users	Platform	E→E COMBINATION	(2b, 2c)	E→T INTERNALIZATION	All users

Analyzing functionalities and flow of knowledge

Functionalities and flows of knowledge					
	Start		flow type	End	
	Kind of user	Action		Result of the action	Kind of user
Write a Public Web Page	Platform	T→E	**(1)**	E→T	All users
Suggestions to users	Platform	E→E	**(2)**	E→T	All users
Content view	Platform	E→E	**(4)**	E→T	All users
Content download	Individual	T→E	**(1)**	E→T	All users
Portal Registration	Individual	T→E	**(2)**	E→E	All users
User Friendship	Individual	T→E	**(2)**	E→T	Individual (friend)
Searching	Individual	T→E	**(2)**	E→T	Individual
Content Ranking	Individual	T→E	**(1)**	E→T	All

- Social Networks (SNs)
  - Oriented to **content**
    - YouTube: mainly service for **P**ublic **U**sers (PU) and to access the content
  - Oriented to **users**
    - Facebook: mainly social services for **R**egistered **U**sers (RU)
- Best Practice Networks (BPNs)
  - Our Best Practice Network: services for PU & RU both social and oriented to content

Functionalities For Public (PU) & Registered Users (RU)		YouTube	Facebook	Our Best Practice Network
Content download & view	Audio	-	-	high (PU&RU)
	Video	high (PU)	low (RU)	high (PU&RU)
	Images	-	High (RU)	high (PU&RU)
	Documents	-	Medium (RU)	high (PU&RU)
	Cross Media	-	-	high (PU&RU)
Portal Registration		low (PU)	high (PU)	high (PU)
User Friendship		low (RU)	high (RU)	high/medium (RU)
Suggestions to users	Same for all	high (PU&RU)	low (RU)	high (PU&RU)
	Different for each user	medium (RU)	medium/high (RU)	high (RU)
Searching	Content	high (PU&RU)	-	high (PU&RU)
	User	-	high (RU)	high (RU)
Content Ranking		high (PU&RU)	medium (RU)	medium (RU)

Our Best Practice Network

- The analyzed BPN has been developed on the basis of an infrastructure called XLMS (Cross Media Learning Management System)

- Other BPNs has been deployed in various contexts by using XLMS infrastructure

- The most relevant BPN from the point of view of the knowledge management analysis is ECLAP

- The analysis has been conducted in the period: September 1st – November 30th 2011:
  - 606 registered users, with 23544 digital items

ECLAP Portal functionalities analysis

□ ECLAP Portal is a BPN and a content aggregator for the **ECLAP** European Project, **E**uropean **C**ollected **L**ibrary of **A**rtistic **P**erformance

□ The collected data are related to both content present in the platform and the user behaviors

□ ECLAP Portal resources are divided in:

▪ Cross Media contents:
  ■ archive, audio, braille music, collection, crossmedia, document, event, epub, excel, flash, html, image, pdf, playlist, slide, smil, tool and video

▪ Drupal contents:
  ■ blogs, forums, groups and pages

ECLAP Portal contents

☐ Drupal contents may be:

- ▪ retrieved, commented, voted, …

☐ Cross Media contents may be:

- ▪ retrieved, annotated, recommended to other users, added to a playlist or to a personal collection, edited, downloaded, marked as favorite or featured, commented, tagged and voted

☐ Also, each Cross Media or Drupal content may be:

- ▪ linked and suggested to users in other Social Networks, with 1-click icons

ECLAP Portal functionalities analysis

Actions oriented to manage content

- **Cross Media Playback and Download**
  - when a user plays a multimedia content a right panel shows related metadata in various languages, content taxonomical classification, IPR information, and geolocation data
  - Cross media content access is one of the most exploited functionalities on the ECLAP portal

- Cross media contents collected 7084 views and 1080 downloads
- Top accessed contents include pages, pdfs, images and videos
- Downloaded Cross Media contents include resources that are not usually for leisure or entertainment, so that the typical downloader is a technical/professional user

ECLAP Portal functionalities analysis

Actions oriented to manage content

- **Drupal Resources View**

  - registered users can create, edit, comment, and translate: pages, groups, forum, blog, etc. with an online rich text editor

- The general blog is the main project repository page (nearly 100 clicks per day)

- During the sample period, the 28 groups created since the start of the project collected 9789 views (more than 100 per day) This was a very popular resource highly exploited by users, and the top most exploited resource, collecting about 46.27% of all Drupal views (34.66% of total views)

- After groups, pages were the top accessed Drupal resources (more than 100 accesses per day , 44.17% of Drupal content accesses, 33.09% of total views on the portal)

- The general ECLAP page collected 673 accesses (7.47 per day, about 1 access each 12 visits to the portal)

- Drupal resource had 74.91% of total views performed on the portal

ECLAP Portal functionalities analysis

Actions oriented to manage content

Content Ranking

- ECLAP contents can be ranked by registered users, using a 5-star based scale

- Top ranked items are collected into a separate list, on the right menu of the portal

- Votes assigned to contents can be changed at any time

ECLAP Portal functionalities analysis

Actions oriented to manage users & social interactions

- **User Friendship**
  - Each registered user can receive connections and friendship requests from other users

- **Portal Registration**

- Friendships and connections between users were established mostly by partners (92.26%)
- Messages were exchanged mostly by partners too (66.67%)
- These numbers suggest that the registered social activities were about technical tasks between the project partners

- In the considered period, there were 396 user registrations, with an average of one registration each 20 visits on the portal

ECLAP Portal functionalities analysis

Actions oriented to manage users & social interactions

□ **Suggestions**

   ❑ Content suggestions are available at access level or menu level:

      ■ Featured

      ■ Last posted

      ■ More Popular

      ■ Similar

      ■ …

□ Featured content was the most exploited content list, with 343 clicks (about 30% of total content list accesses), followed by Last Posted (23%) and Popular contents (20%)

□ Similar contents were accessed 2864 times

□ Content lists collected 1140 clicks from users, about 0.14 clicks per visit and 12.67 clicks per day

ECLAP Portal functionalities analysis

Actions oriented to manage users & social interactions

- **Searching**
  - Search is divided in simple and advanced
  - Simple search allows full text search of ECLAP resources, eventually filtered by type

- Query services were one of the top exploited functionalities in the portal
- Most of the queries were of simple type (about 99%), performed from the main page, and a limited fraction were advanced queries
- 65% of queries were performed from Public Users

ECLAP Portal functionalities analysis

Actions oriented to manage users & social interactions

- **User Behavior**
  - ◼ functionalities are addressed both to Public and to Registered Users
  - ◼ social connections are mainly oriented to contact the ECLAP Partners
  - ◼ the functionalities provided are oriented to enable the Partners to do their work on the BPN, and not created to enhance leisure or for entertainment

- Public users typically started their session by clicking on the ECLAP menu in the top home page (24.73%), viewing a content (cross media 21.83%, Drupal 15.83%, group 14.77%), or performing a query (12.79%)

- user actions are equally:
  - finalized to manage content (total access: 12.656) and to establish social connections on the portal (access: 20.522)
  - distributed in terms of SECI modes of knowledge conversions (with the exception of the Socialization, that is mainly based on relations among people in the real world, and not through the use of web platforms)

ECLAP Portal functionalities analysis

Functionality		Target	Source Path	Total users' Accesses	
Oriented to manage content	Crossmedia View/Play	RU&PU	Search Filter (2) Content lists (2) Keyword Cloud (2) Query Cloud (2) Groups (2)	7084 (pdf: 2543, image: 2477, video: 1614, …)	Total users' actions on content 12656
	Searching (Simple, Advanced, Faceted, Cloud search)	PU&RU	Search Form (0) Menu (1)	4484	
	Crossmedia Download	RU&PU	Search Filter (2) Content lists (2) Keyword Cloud (2) Query Cloud (2) Groups (2)	1080 (pdf : 884, document: 70, slide: 39, …)	
	Crossmedia Ranking/ Voting	PU&RU	Featured (2) Search Filter (3) Content (3) Keyword Cloud (3) Query Cloud (3) Groups (3)	8	
Oriented to manage users and social interactions	Drupal contents View (blogs, pages, groups, forums)	RU&PU	Groups (3) Menu (1) Search (2)	20111	Total users' social actions 20522
	Portal Registration	PU	Register Button (1)	396	
	User Friendship (direct messages, invitations)	RU	Menu (3)	15 (messages: 9, invitations: 6)	

- ECLAP Portal

www.eclap.eu.org

- The analysis has been conducted in the period: September 1st – November 30th 2011

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Conclusions & Future work

- We have collected and evaluated data related to our Best Practice Network applied in a real context (ECLAP Portal)

- Future work is oriented to:

  - increase the user behavior analysis in order to establish if a functionality provided by the platform has really stimulated the users:
    - to produce new knowledge
    - to establish new relationships, etc.

  - establish metrics to evaluate what are the points of strength or weakness of the platform, and how to give new stimuli to the users:
    - how to increase the data processing capabilities (**Mediated and Platform flows**)
    - How decrease the loss of information (**Locked flow**)

  - make a comparison among our portal, eventually applied in other contexts, and the most diffused Social Portals at data level and not only basing on functionalities (through the data crawling, etc.)

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