


Sistemi Distribuiti

Corso di Laurea in Ingegneria


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Part 19 – Overview of social Network

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Overview of Social Network

- Definition of Social Network ←
- Terminology and Social Networks
- Classification of Social Networks
- User Generated Content, UGC
- Measures of Social Networks
- Recommendations and complexity
- Mobile Medicine
 - A view inside a social network




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Introduction

- With the users demand in collaborating and sharing information some Social Networks have been created
- **Social Networks** are (OECD, Organisation for Economic Co-operation and Development) web portals that:
 - ♣ Allow users to provide and share User Generated Content
 - ♣ Allow users to valorize their creative effort, the content should be originally produced by the users, take a picture, compose a set of images, sync. images and audio, etc.
 - ♣ Allow users to produce content by using solutions and non professional techniques
- Other solutions using UGC are Blogs, Wiki, Forum, etc.




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Terminology

- **Social Network**
 - ♣ A paradigm of user interaction and behavior on the web
- **Social Media**
 - ♣ A Social network based on media
- **Social TV**
 - ♣ A TV based on Social Networking principles, with the support of UGC, etc.
- **Social Network Analysis**
 - ♣ The discipline to analyze the social network in terms of user clustering and relationships, metrics for SN assessment, etc..
 - ♣ It can be used to better understand motivation and rationales of success and/or problems.




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Classification of Social Networks

- **Content Based Social Network:**
 - ♣ Collect content and show them to users according to their preferences
 - ♣ Content correlation
 - ♣ Content recommendations
 - ♣ Examples: YouTube, Last.fm, Flickr
- **User Based Social Network :**
 - ♣ User collection, user profiled
 - ♣ Audio and video are used to better describe the user profile, in some cases, they are only visible to their friends
 - ♣ User Recommendations, taking into account a large number of user description aspects
 - ♣ Examples: FaceBook, Orkut, Friendster
- MySpace is a mix of both categories.




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Votes/ranks, Comments, preferred

- Users may leave on Content and Users:
 - ♣ Comments
 - ♣ Ranks and Votes
- Comments may be left as
 - ♣ Text or content
- User may mark the preferred content and users (friends)
 - ♣ Preferred content are accessible with a direct list to shortening the time for their play




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User Generated Content, UGC

- **Conditions that Facilitated the growth of UGC**
 - ♣ Reduced costs for equipments which allow the personal content production: cameras, smart phones, etc.
 - ♣ Reduced costs of connection, increment of broadband diffusion
 - ♣ More Web Interactive capabilities: Ajax, JSP
 - ♣ Creative Commons Licensing/formalisms, increment of confidence
- **Pros and Facilitations**
 - ♣ Growing of WEB sites that host your content and provide some tools to make them accessible on web for your friends
 - ♣ Natural selection/emergence of better UGC items, increment of visibility for some of UGC users...
 - ♣ Annotation and reuse of UGC of others




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User Generated Content

- **Cons and problems**
 - ♣ Restricted social penetration since only IT skilled and a certain economical capability may access now
 - ♣ Lack of formal Privacy control
 - Too many information are requested
 - Some people do not expose their true personal info
 - ♣ IPR problems:
 - Violation of IPR of third party, free usage of UGC
 - Lose of control of your own UGC
 - Reuse and annotation of professional content




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User Generated Content

- **Cons and problems**
 - ♣ Lack of interoperability for users and content among different social networks:
 - Initially performed to keep connected the users
 - Secondly a point of cons since users tend to pass from one SN to another
 - ♣ Content is not completely defined in terms of Metadata
 - ♣ Competitions of UGC against professional content, producers are against their support and diffusion
 - ♣ Growing costs for the SN providers
 - Content volume in the hand of the SN organizers is growing
 - Users would like to see older content still accessible







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User Activities on Social Networks


- **Wikipedia (2006)**
 - ♣ 68000: active users
 - ♣ 32 millions of lurkers
 - ♣ While the 1000 more active users produced the 66% of changes.
- **Similar numbers in other portals:**
 - ♣ 90% lurkers
 - ♣ 9% occasional users
 - ♣ 1% active users

 - ♣ 90% is produced by the 1% of active users
 - ♣ 10% is generated by the 9% of users including the occasional




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Social Network Activities meaning

- **Since the 90% is managed by a small percentage of active users:**
 - ♣ Votes are also produced with the same small part of the community
 - ♣ Comments are also produced with the same small part of the community
 - ♣ Pushers are frequently needed to create activities and waves into the Social Networks, they create fashions and interests among the lurkers, etc.. ..
- **Number of plays** are produced by the whole community




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The centrality of User profile



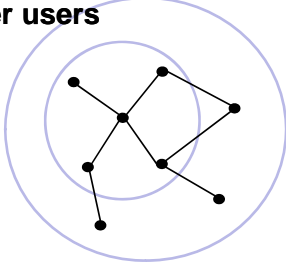
- **User Profile Static information**
 - ♣ Name, surname, Nationality
 - ♣ Genre, age, languages, etc..other personal info,..
 - ♣ School, work, family, etc.
 - ♣ photo, etc..
 - ♣ Economical data
- **User Profile Dynamic Information**
 - ♣ Explicit Preferences in terms of content, friends, votes, ranks, recommendations, etc..
 - ♣ Actions: play, comments, votes,
 - ♣ Frequency of access
 - ♣ Etc.



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Relevance of Users



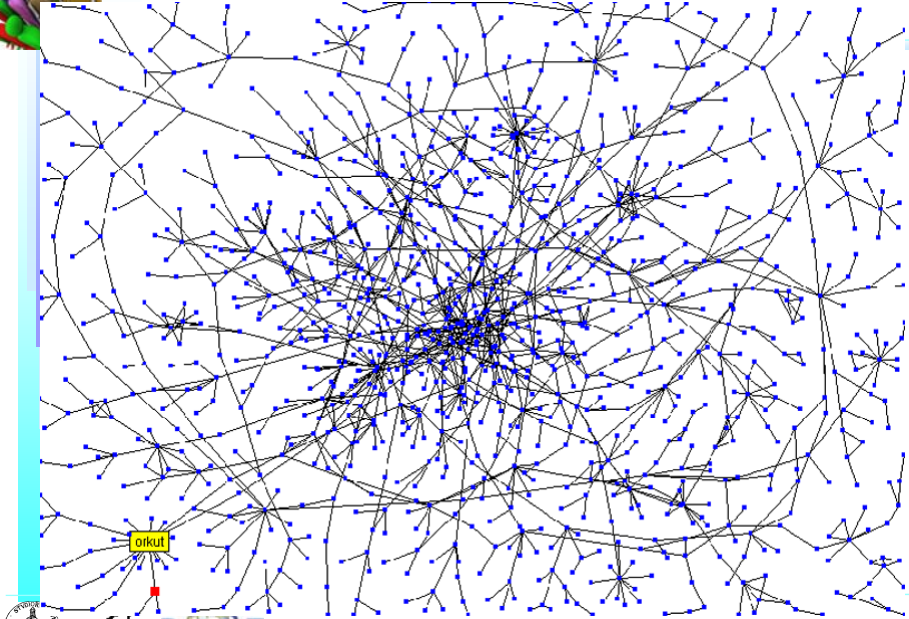
- **Number of Connections with other users**
 - Direct connections,
 - ♣ Second and third level connections,
 - ♣ Etc.
- **Number of accesses to their**
 - ♣ profile page (if any)
 - ♣ posted and/or preferred content
 - ♣ Comments
 - ♣ groups
- **Users' Activities**
 - ♣ Number of Posted content
 - ♣ Number of posted comments
 - ♣ Number of votes, etc.
 - ♣ Number of accesses



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Stanford Social Web




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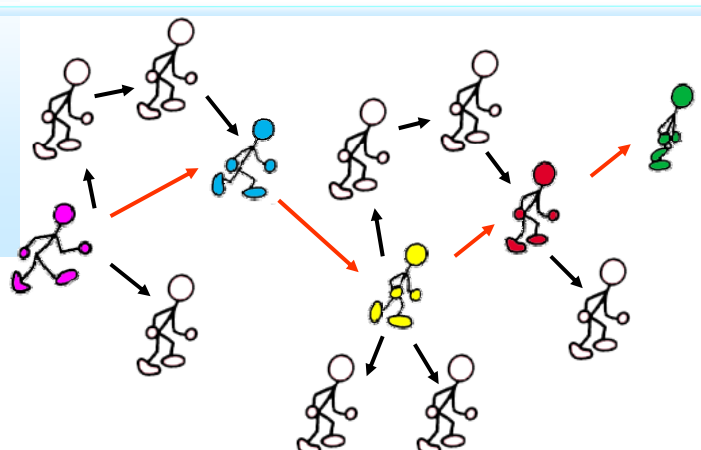
Issues on Communitie Graphs

- Presence of a main Center of gravity
 - ✦ Presence of dense groups
- Presences of remotely located smaller Groups
 - ✦ Self connections among these people
 - ✦ Some of these smaller remote groups are linked with the rest via 1 or more chains of single people
 - Depending on their activities, there is a risk of losing those communities is evident
- Number of Connections
 - ✦ Distribution of connections




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Shortest path from one person to another



MIT: 6.4 hops Stanford: 9.2 hops




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Metriche per le Social Network


- Social Network Analysis
- Degree of Centrality per un Nodo:
 - ✦ Numero di collegamenti incidenti sul Nodo
- Eccentricity of Centrality per un Nodo:
 - ✦ La dist. massima fra le distanze minime di tale nodo e ogni altro nodo della rete
- Closeness of Centrality per un certo Nodo:
 - ✦ Reciproco della somma delle distanze tra il nodo e tutti gli altri nodi
- Betweenness Centrality per un certo nodo:
 - ✦ Quanta informazione passa per quel nodo. Somme delle quantita' di informazione che passa fra tale nodo ed ogni altro nodo della rete.




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Recommendations

- **They are a means for the**
 - ♣ Usage of content/object info to find/propose users
 - ♣ Usage of users info to find/propose content
 - ♣ Usage of users info to find/propose other users
 - ♣ Etc..
- **Different Recommendations**
 - ♣ $U \rightarrow U$: a user to another user on the basis of his profile
 - ♣ $O \rightarrow U$: an object at a user on the basis of his profile
 - ♣ $O \rightarrow O$: an object on the basis of a played object of a user
 - ♣ $G \rightarrow U$: a group to a user
 - ♣ Etc...
- **Objects can be Advertising, Ads, Content, Events, Groups, etc.....**




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Different Recommendations

- **FOR YOU: Suggesting Users to another Users since they**
 - ♣ have similar preferences
 - ♣ like/prefer what you like/prefer
 - ♣ are friends of your friends
 - ♣ are in one or more of the your groups
 - ♣ are new of the SN!
 - ♣ are the most linked, the most grouped, etc.
- **FOR THE SN: Suggesting Users to another Users since they**
 - ♣ *are important for the SN and do not have to left alone, the new entry*
 - ♣ *are the only contact path for Connecting a remote group, if the path is left a peripheral group will be completely disjointed with respect to the rest of the SN*
 - ♣ ...





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Complexity of Recommendation

- **Each day N new users** reach the SN,
The SN has to suggest its possible friends immediately:
 - 1 Million of users in the SN (number of users, $U=10^6$)
 - $N*U$ distances to be estimated in real time/per day
 - Complexity is an $O(NU)$
 - Thus: 10^{12} estimations of 10ms, thus 10^{10} s, 317 years !!!
- **Each day M new UGC items** are posted on the SN,
The SN has to estimate the distance of that content with respect to all the other items/objects and users:
 - 1 Million of content in the SN (number of content, $C=10^6$)
 - $M*C$ distances to be estimated in real time/per day
 - $M*U$ distances to be estimated in real time/per day
 - Complexity is an $O(MC+MU)$
 - Thus: 10^{12} estimations of 10ms, thus 10^{10} s, 317 years !!!



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SN Comparison on Users

	YouTube	Flickr	FaceBook	LikedIn	MySpace	XMF
User profile, descriptors	Y	Y	Y	Y	Y	Y
Friends	Y	Y	Y	Y	Y	Y
Query on Users			Y	Y	Y	Y
Groups and Forums	Y	Y	Y	Y	Y	Y
Multilingual pages	Y	Y	Y	Y	Y	--
Invitations of users	Y	Y	Y	Y	Y	Y
Chats, on line, messages	Y	Y	Y	Y	Y	N
Recommendation $U \rightarrow U$	N	N	Y	Y	Y	Y
User Relevance, User,Obj,Group	Y(UO)	Y(OG)	Y(UG)	Y(UG)	Y(UG)	N
User Lists, gen rec. of users	Y	N	Y	Y	Y	Y(G)
Taxonomy on Users	N	N	N	N	N	Y
Direct call, SMS, Email	Y	Y	Y	Y	Y	Y(SE)
Privacy support, Black List users	Y	N	Y	Y	Y	N
Events	N	N	Y	Y	Y	N






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SN Comparison on Content

	YouTube	Flickr	FaceBook	LikedIn	MySpace	XMF
Multimedia, crossmedia UGC	Y(M)	Y(M)	Y(M)	N	N	Y(MC)
Audio, Video, Images, Doc	Y	I, V	I, D, V	I, D	I, V	A, V, I, D
Moderated UGC	Y	N			N	(Y)
Query on content	Y	Y	N	N	Y	Y
Comments on Content	Y	Y	--	--	Y	Y
Ranking and voting	Y	N	--	--	Y	Y
General Recommendation O	Y	Y	Y	Y	Y	Y
Recommendation O→U	Y	Y	--	--	Y	Y
Recommendation O→O	Y	N	--	--	N	(Y)
Taxonomy for content/profile	N	N	N	N	N	Y
Play Lists of content	Y	N	N	N	N	N
RSS Feeds for content	Y	Y			Y	N
Links with other SN	Y	Y	Y	Y	Y	(Y)
Mobile Support	Y	Y	Y	Y	Y	Y
DRM/CAS Support	Y(D)	N	N	N	N	Y(D)
GeoTagging	Y	Y	N	N	N	N






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Numbers of YouTube (2009), it is true?

- Google is spending > \$2Million per day on YouTube
 - ✦ Lose \$1,4 – 1,6 million per day on the video site
- \$1 Million of bandwidth per day
 - ✦ 375 millions of visitors in the 2009, each of them get a video at 400kbit/s
 - ✦ Taking into account a rate of 50% of the lowest market rate for mbps per service
- \$710.000 for the content acquisition per day
 - ✦ They have to pay for Sony, BMG, CBS, etc.
- \$66.000 revenue sharing with third party content providers, per day
 - ✦ See above, the sharing for the same content of majors
- \$36.000 data center: HW, power, SW, location,, per day
 - ✦ Every minute, 15 hours of video are uploaded, 86.000 new full video per week, 20-40 Mbyte for each video
 - ✦ storing about 5 PetaByte, \$2 per Gbyte, thus \$13 million per year of storage.
- \$252.000 administrative costs per day
 - ✦ which is a percentage of the business, more or less, 38,4 % as the mother company YouTube


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YouTube Numbers

- **In the 2006:**
 - ♣ 15 million movie per day
 - ♣ 2-3 minute per video
- **From Credit Suisse** according to the previous page:
 - ♣ Google is losing \$470 Millions in 2009 with YouTube
 - ♣ YouTube pays
 - \$191 Million/year for Royalties on content
 - \$399 Million/year for network infrastructure
 - ♣ YouTube collects
 - \$182 Million/year on advertising
 - ♣ Thus YouTube would distribute also Sony Picture Video
 - Asking to user a small fee for each video, 5cents each




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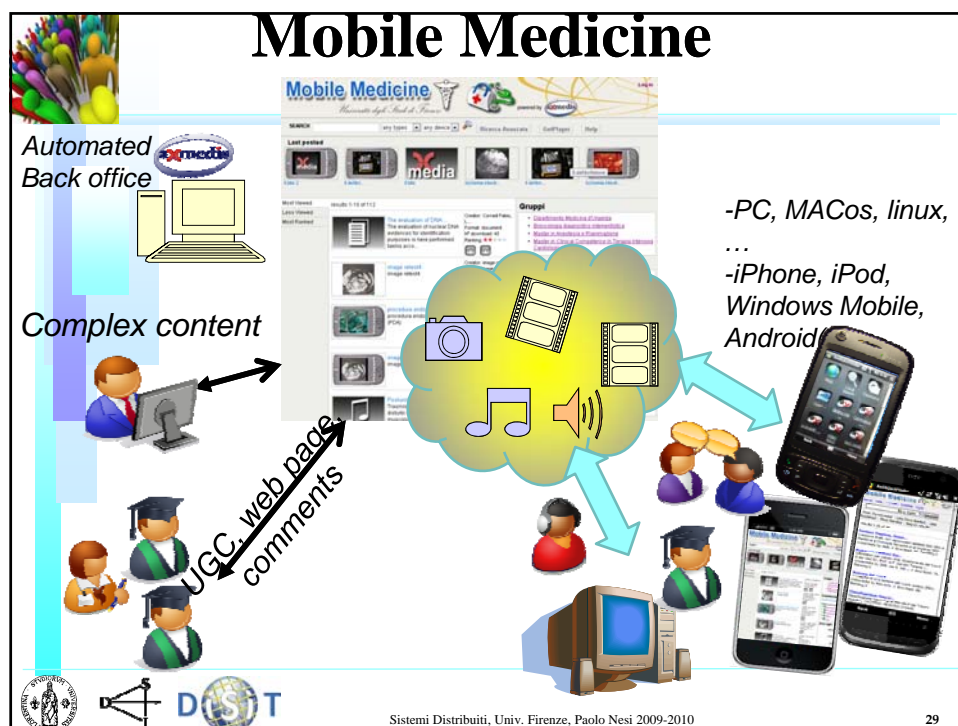
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Feature principali

- **Utenti e Servizi:**
 - ✦ registrazione via email, profilo utente, ...
 - ✦ ricerche di altri utenti per stabilire relazioni sociali, ...
 - ✦ upload di contenuti, User Generated Content, UGEperiences, ...
 - ✦ conversioni automatiche dei loro contenuti per la distribuzione multicanale, ...
- **Aspetti Sociali, Social Network:**
 - ✦ commenti su contenuti, creazioni di discussioni sui contenuti, etc.
 - ✦ gestione Contenuti Preferiti, visione dei contenuti caricati/preferiti da/di amici, ...
 - ✦ gestione dei propri Amici, Gruppi (ancora non attivo), ...
 - ✦ Produzione raccomandazioni per trovare altri amici
 - ✦ Produzione raccomandazioni per trovare contenuti, ... (ancora non attivo), ...



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Visualizzazione di Suggerimenti e dist

Potential friends

[phistestasla](#)
26
ECUADOR, Orellana
[Add to your friends](#) [Details](#)

[shastu](#)
29
CHRISTMAS ISLAND
[Add to your friends](#) [Details](#)

[driphifras](#)
15
FRENCH POLYNESIA
[Add to your friends](#) [Details](#)

[kuslechi](#)
16
SRI LANKA, Kurunegala
[Add to your friends](#) [Details](#)

[hetheruno](#)
15
MALDIVES, Raa
[Add to your friends](#) [Details](#)

1 2 [next](#) [last](#)»

phistestasla proximity details

languages:

favorites:

location:


interests:

friends:

activity:

age:

school_job:




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Intelligent Cross Media Content

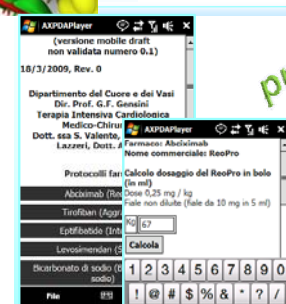
- **Evolved Business Models:**
 - ♣ **Educational:**
 - ➔ Sliding Shows, video, document, audio, images...
 - ♣ **Procedures/protocols:** (mini applications)
 - ➔ Assessing conditions: emergency..
 - ➔ Guidelines, routines/procedures, flows, ...
 - ♣ **Calculators** for several aspects: (mini applications)
 - ➔ Dosages and formulas for intensive therapy
 - ➔ Estimation of rule for assessing conditions
 - ➔ Risk analysis, ...e.g.: pulmonary emboli....
 - ➔ Classification of conditions/damages, ...
 - ♣ **Wizards: active and proactive content**
 - ➔ Self-unpacking, guiding the user




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Mobile Medicine Content



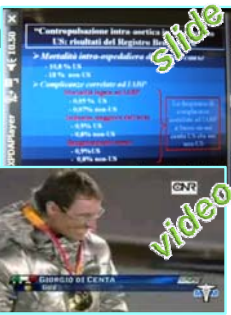
procedure




video



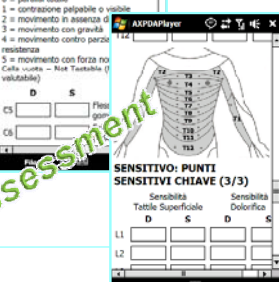
DOC




slide




Dosages



Assessment

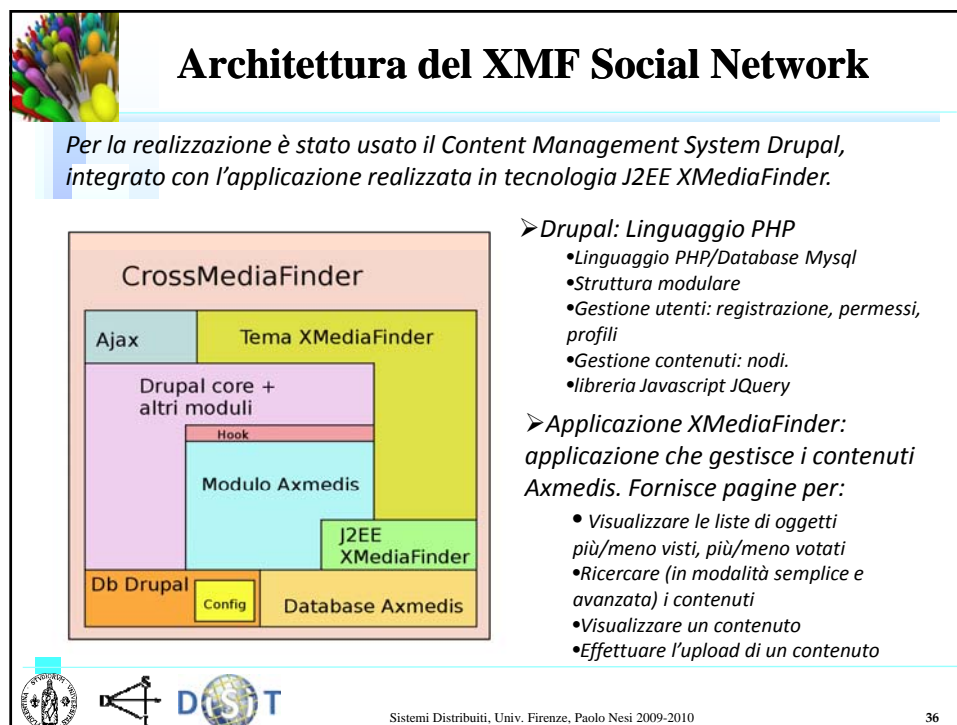
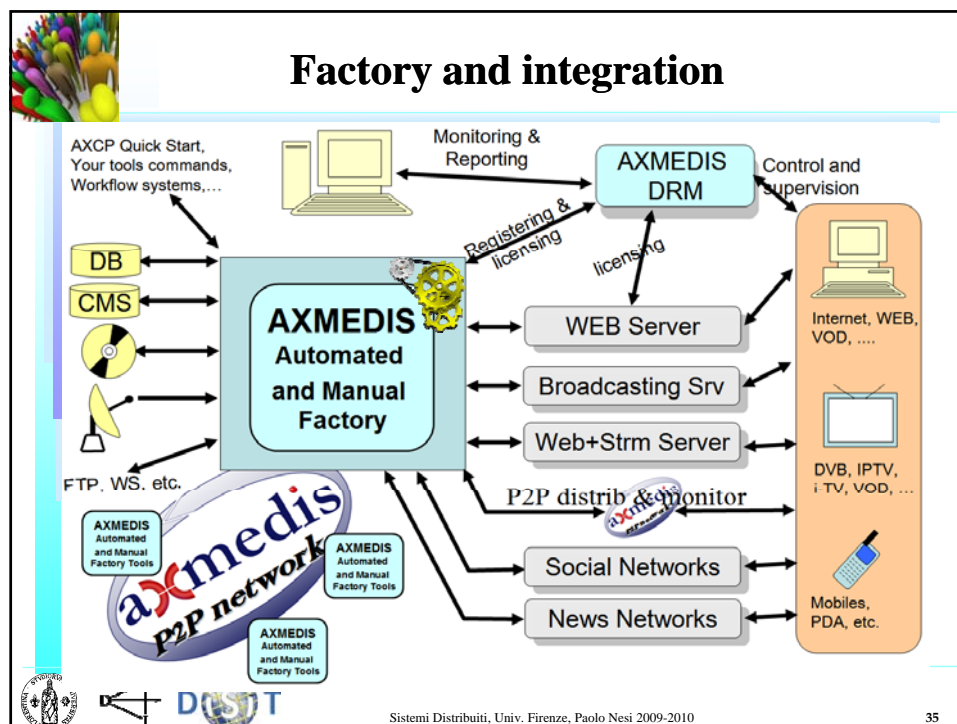


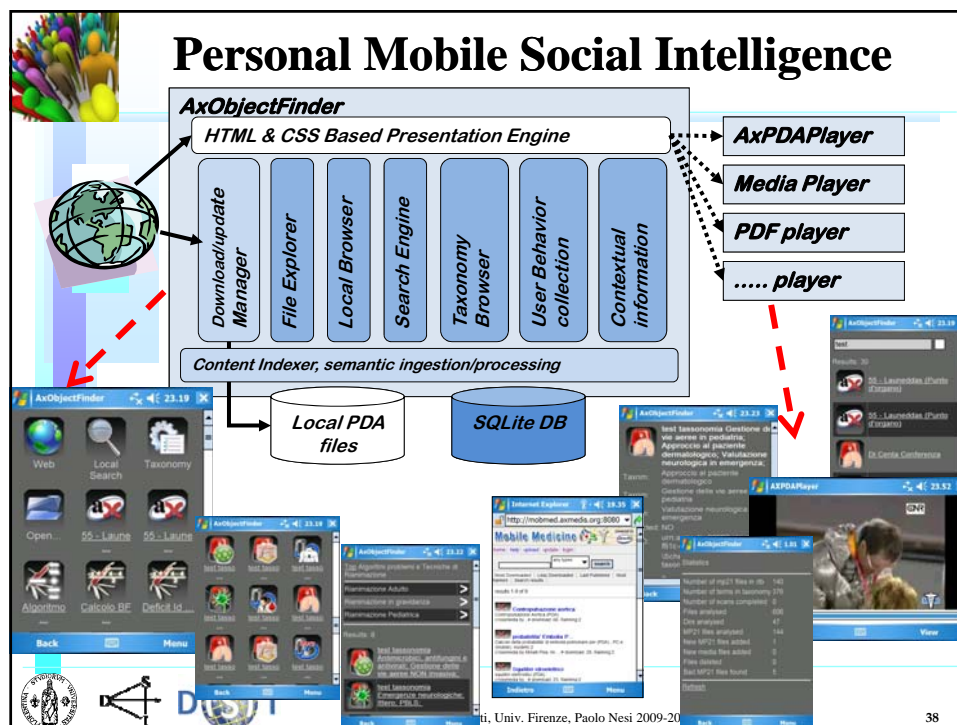
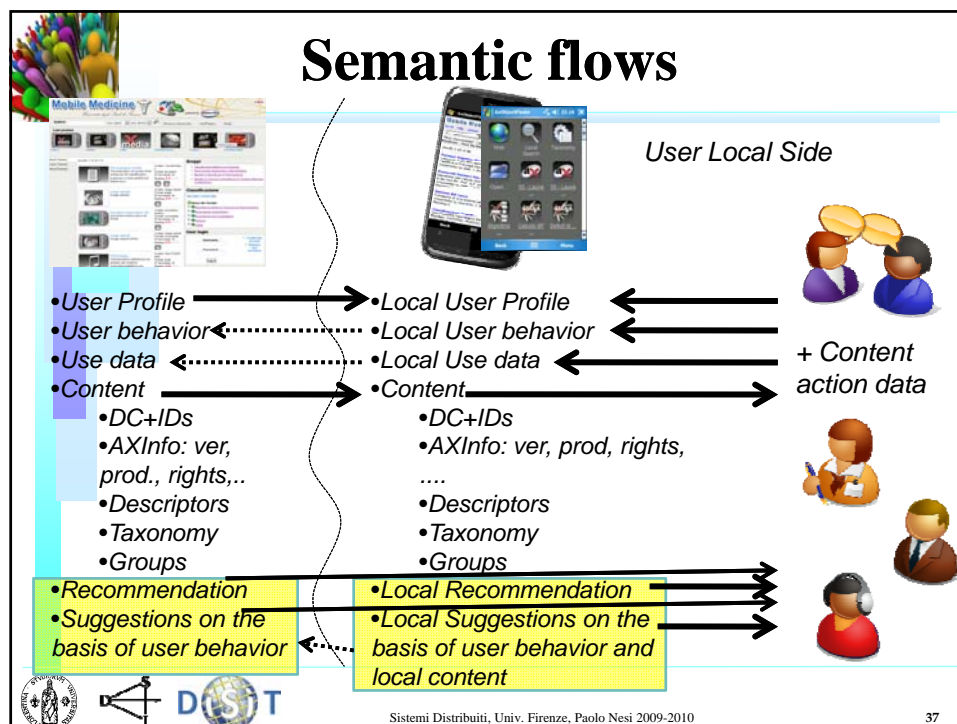
Dosages




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Links For Further Research

- Flickr: photo sharing community <http://www.flickr.com/>
- YouTube: video sharing community <http://www.youtube.com/>
- Myspace. www.myspace.com
- Facebook. www.facebook.com
- Friendster. www.friendster.com
- Orkut. www.orkut.com
- CrossMediaFinder, XMF. <http://xmf.axmedis.org/>
- Mobile Medicine: <http://mobmed.axmedis.org>
- Last.FM: social networking through music interests
<http://www.last.fm/>
- create your own social network <http://www.ning.com/>
- MOODLE: open source e-learning system <http://moodle.org/>



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