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
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.
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.
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.
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 grown 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
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
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


- 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
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
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.
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
Stanford Social Web
Issues on Communitie Graphs

- Presence of a main Center of gravity
  - Presence of dense groups
- Presencees 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
Shortest path from one person to another

MIT: 6.4 hops

Stanford: 9.2 hops
Metriche per le Social Network

1. 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 quantità 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 → U: a user to another user on the basis of his profile
- O → U: an object at a user on the basis of his profile
- O → O: an object on the basis of a played object of a user
- G → U: a group to a user
- Etc…

Objects can be Advertising, Ads, Content, Events, Groups, etc…..
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 disjoined 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 !!!
## SN Comparison on Users

<table>
<thead>
<tr>
<th>Feature</th>
<th>YouTube</th>
<th>Flickr</th>
<th>FaceBook</th>
<th>LinkedIn</th>
<th>MySpace</th>
<th>XMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>User profile, descriptors</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Friends</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Query on Users</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Groups and Forums</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Multilingual pages</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>--</td>
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<tr>
<td>Invitations of users</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Chats, on line, messages</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Recommendation U→U</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>User Relevance, User, Obj, Group</td>
<td>Y(UO)</td>
<td>Y(OG)</td>
<td>Y(UG)</td>
<td>Y(UG)</td>
<td>Y(UG)</td>
<td>N</td>
</tr>
<tr>
<td>User Lists, gen rec. of users</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y(G)</td>
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<tr>
<td>Taxonomy on Users</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Direct call, SMS, Email</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y(SE)</td>
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<tr>
<td>Privacy support, Black List users</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<tr>
<td>Events</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
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</table>

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## SN Comparison on Content

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<thead>
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<th>LinkedIn</th>
<th>MySpace</th>
<th>XMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimedia, crossmedia UGC</td>
<td>Y(M)</td>
<td>Y(M)</td>
<td>Y(M)</td>
<td>N</td>
<td>N</td>
<td>Y(MC)</td>
</tr>
<tr>
<td>Moderated UGC</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>N</td>
<td></td>
<td>(Y)</td>
</tr>
<tr>
<td>Query on content</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Comments on Content</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Ranking and voting</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>General Recommendation O</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Recommendation O→U</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Recommendation O→O</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td>N</td>
<td>(Y)</td>
</tr>
<tr>
<td>Taxonomy for content/profile</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Play Lists of content</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>RSS Feeds for content</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Links with other SN</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>(Y)</td>
</tr>
<tr>
<td>Mobile Support</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>DRM/CAS Support</td>
<td>Y(D)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y (D)</td>
</tr>
<tr>
<td>GeoTagging</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
Numbers of YouTube (2009), it is true?

- Google is spending > $2 Million 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 400 kbit/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
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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Mobile Medicine

- PC, MACos, linux, ...
- iPhone, iPod, Windows Mobile, Android

Automated Back office

Complex content

UGC, web page, comments
XMF: CrossMediaFinder

ricerche

Contributi

Contenuti proattivi

Multicanale

Attività Sociali

Carica contenuti

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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, UGEsperiences, ...
- 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), ...
Visualizzazione di Suggerimenti e dist

**Potential friends**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Add to your friends</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>phistestasla</td>
<td>ECUADOR, Orellana</td>
<td>Add to your friends</td>
<td>Details</td>
</tr>
<tr>
<td>shastu</td>
<td>CHRISTMAS ISLAND</td>
<td>Add to your friends</td>
<td>Details</td>
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<tr>
<td>driphifras</td>
<td>FRENCH POLYNESIA</td>
<td>Add to your friends</td>
<td>Details</td>
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<tr>
<td>kuslechi</td>
<td>SRI LANKA, Kurunegala</td>
<td>Add to your friends</td>
<td>Details</td>
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<tr>
<td>hetheruno</td>
<td>MALDIVES, Raa</td>
<td>Add to your friends</td>
<td>Details</td>
</tr>
</tbody>
</table>

**phistestasla proximity details**

<table>
<thead>
<tr>
<th>Languages:</th>
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<tr>
<th>Favorites:</th>
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<th>Location:</th>
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<tr>
<th>Interests:</th>
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<tr>
<th>Friends:</th>
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<th>Activity:</th>
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<th>Age:</th>
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<thead>
<tr>
<th>School Job:</th>
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</table>
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
Factory and integration

AXMEDIS Automated and Manual Factory

Monitoring & Reporting

AXMEDIS DRM

Control and supervision

Registering & licensing

DB

CMS

FTP, WS, etc.

AXMEDIS Automated and Manual Factory Tools

AXMEDIS Automated and Manual Factory Tools

AXMEDIS Automated and Manual Factory Tools

AXMEDIS Automated and Manual Factory Tools

Internet, WEB, VOD, ....

DVB, IPTV, i-TV, VOD, ...

Mobiles, PDA, etc.

WEB Server

Broadcasting Srv

Web+Strm Server

Social Networks

News Networks

P2P distrib & monitor
Per la realizzazione è stato usato il Content Management System Drupal, integrato con l’applicazione realizzata in tecnologia J2EE XMediaFinder.

- **Drupal:** Linguaggio PHP
  - Linguaggio PHP/Database Mysql
  - Struttura modulare
  - Gestione utenti: registrazione, permessi, profili
  - Gestione contenuti: nodi.
  - libreria Javascript JQuery

- **Applicazione XMediaFinder:** applicazione che gestisce i contenuti
  Axmedis. Fornisce pagine per:
  - Visualizzare le liste di oggetti più/meno visti, più/meno votati
  - Ricercare (in modalità semplice e avanzata) i contenuti
  - Visualizzare un contenuto
  - Effettuare l’upload di un contenuto
Semantic flows

User Local Side

- User Profile
- User behavior
- Use data
- Content
  - DC+IDs
  - AXInfo: ver, prod., rights,..
  - Descriptors
  - Taxonomy
  - Groups
- Recommendation
- Suggestions on the basis of user behavior

Local User Profile
Local User behavior
Local Use data
Content
DC+IDs
AXInfo: ver, prod, rights,..
Descriptors
Taxonomy
Groups
Local Recommendation
Local Suggestions on the basis of user behavior and local content

+ Content action data
Personal Mobile Social Intelligence

AxObjectFinder
HTML & CSS Based Presentation Engine

- Download/update Manager
- File Explorer
- Local Browser
- Search Engine
- Taxonomy Browser
- User Behavior collection
- Contextual information

AxPDAPlayer
- Media Player
- PDF player
- ..... player

Content Indexer, semantic ingestion/processing

Local PDA files
SQLite DB

Local PDA files
SQLite DB

Content Indexer, semantic ingestion/processing

Local PDA files
SQLite DB

Content Indexer, semantic ingestion/processing

Local PDA files
SQLite DB

Content Indexer, semantic ingestion/processing

Local PDA files
SQLite DB
Links For Further Research

- YouTube: video sharing community  [http://www.youtube.com/](http://www.youtube.com/)
- Myspace.  [www.myspace.com](http://www.myspace.com)
- Facebook.  [www.facebook.com](http://www.facebook.com)
- Friendster.  [www.friendster.com](http://www.friendster.com)
- Orkut.  [www.orkut.com](http://www.orkut.com)
- Mobile Medicine:  [http://mobmed.axmedis.org](http://mobmed.axmedis.org)