Web of Documents, Web of People, and Web of Creativity

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Outline

- Community Web
  - The model for Community Web
  - Social media
  - Massively collaborative creation
- Social analysis of massively collaborative creation on a video sharing site
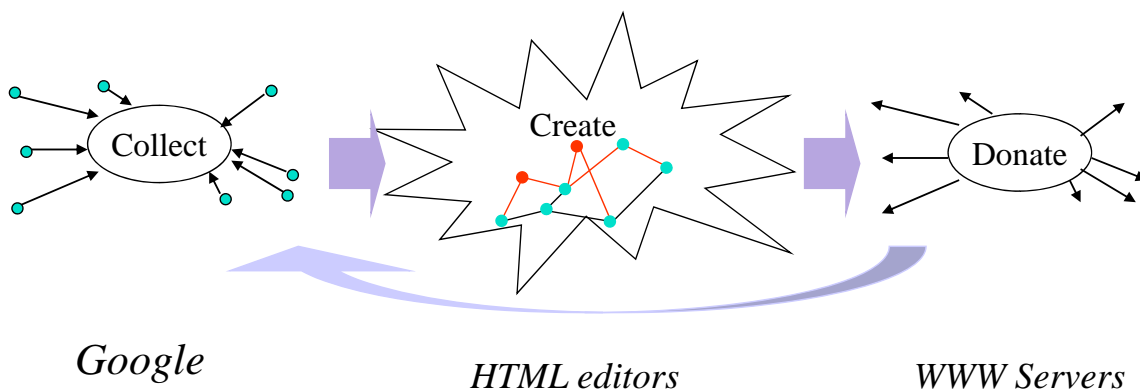- Conculsion

Rip. Mix. Burn.

The new iMac.
With iTunes + CD-RW drive.

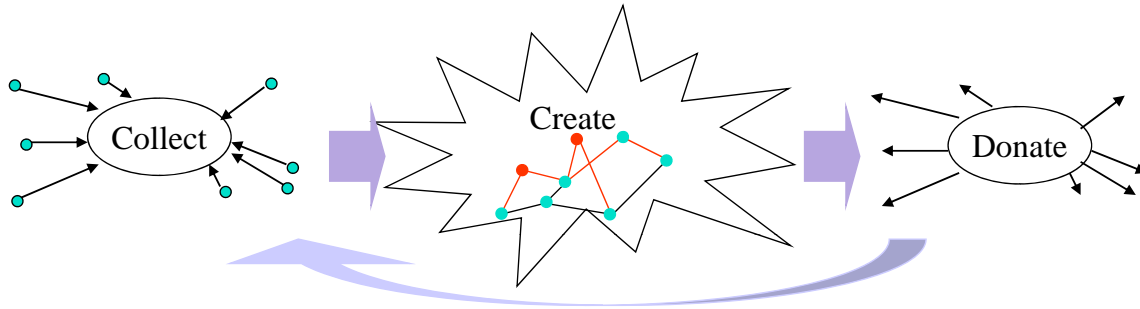# Information Circulation

Collect

Create

Donate

Google

HTML editors

WWW Servers

- *A new cycle is emerged!*

Modified from Ben Shneiderman's matrix of human activities ("Leonardo's Laptop")
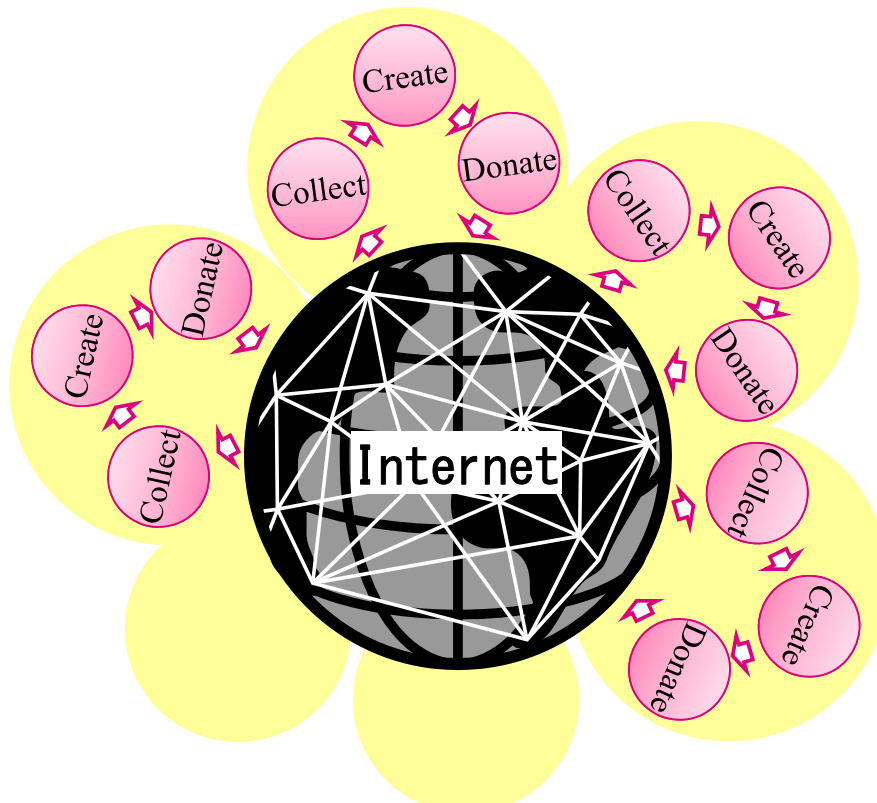
Information Circulation

- Collecting information
  - Past: Libraries (limited just for books)
  - Now: Google
- Creating new information
  - Past: creating from the scratch
  - Now: creating with knowing other existing information
- Donating (publishing) information
  - Past: Books, Journals, Mass Media (difficult part for ordinary people)
  - Now: WWW
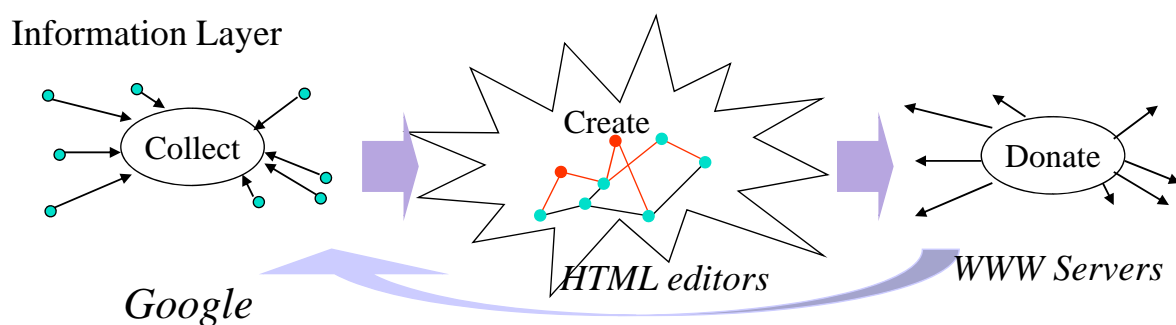
Internet as Information Activities

Change of Information Circulation System

- Pros:
  - Change of power: from limited people to everyone
  - Change of scale: from limited sources to unlimited sources
  - Change of content: from qualified contents to everyday/everyone contents
- Cons:
  - Lost of control
    - Even criminal information can be distributed
  - Lost of quality assurance

Information and Communication Activities

- Two layers for our activities
  - *Information layer* concerns how information is explicitly represented and processed.

Information Layer

Google   *HTML editors*   *WWW Servers*

something is missing

People!

Information and Communication Activities

- Two layers for our activities
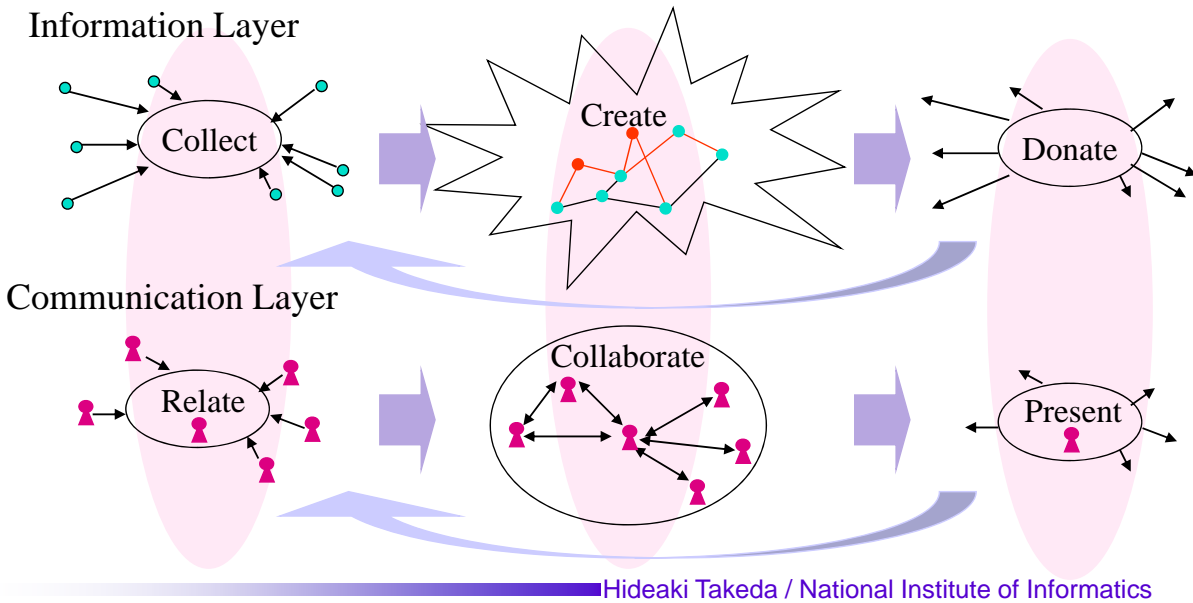   - *Information layer* concerns how information is explicitly represented and processed.
    - *Communication layer* concerns how relationship among people are organized and maintained, which is potential route for information.

Information Layer

Collect → Create → Donate

Communication Layer

Relate → Collaborate → Present

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Web as Communication

- Web was created for research community
- It is designed mainly for data and information exchange
- But it was soon used for communication too

Web as Communication

- Typical Web Page
  - Data and information on research
  - Information for self introduction
  - What's new
  - Links for colleagues
  - Pages for groups

Information for Communication
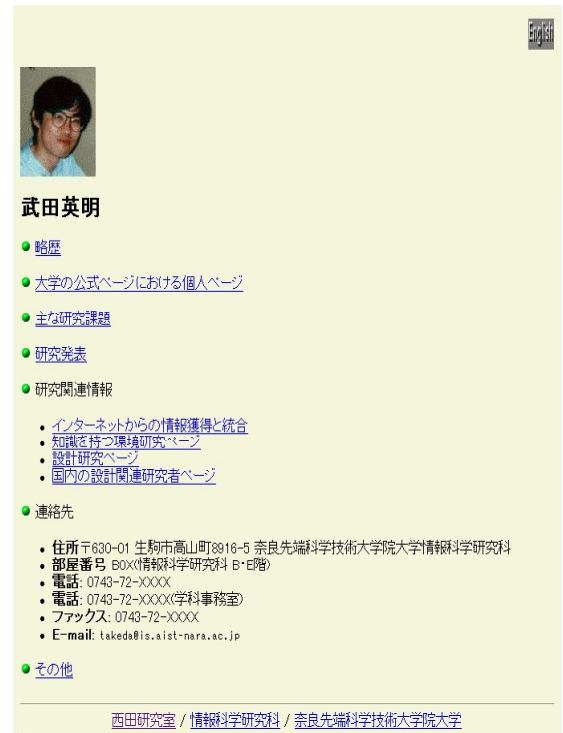
My web page around 1996

Web as Communication

- Typical Web Page
  - Data and information on research
  - Information for self introduction
  - What's new
  - Links for colleagues
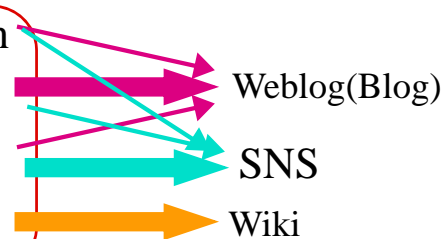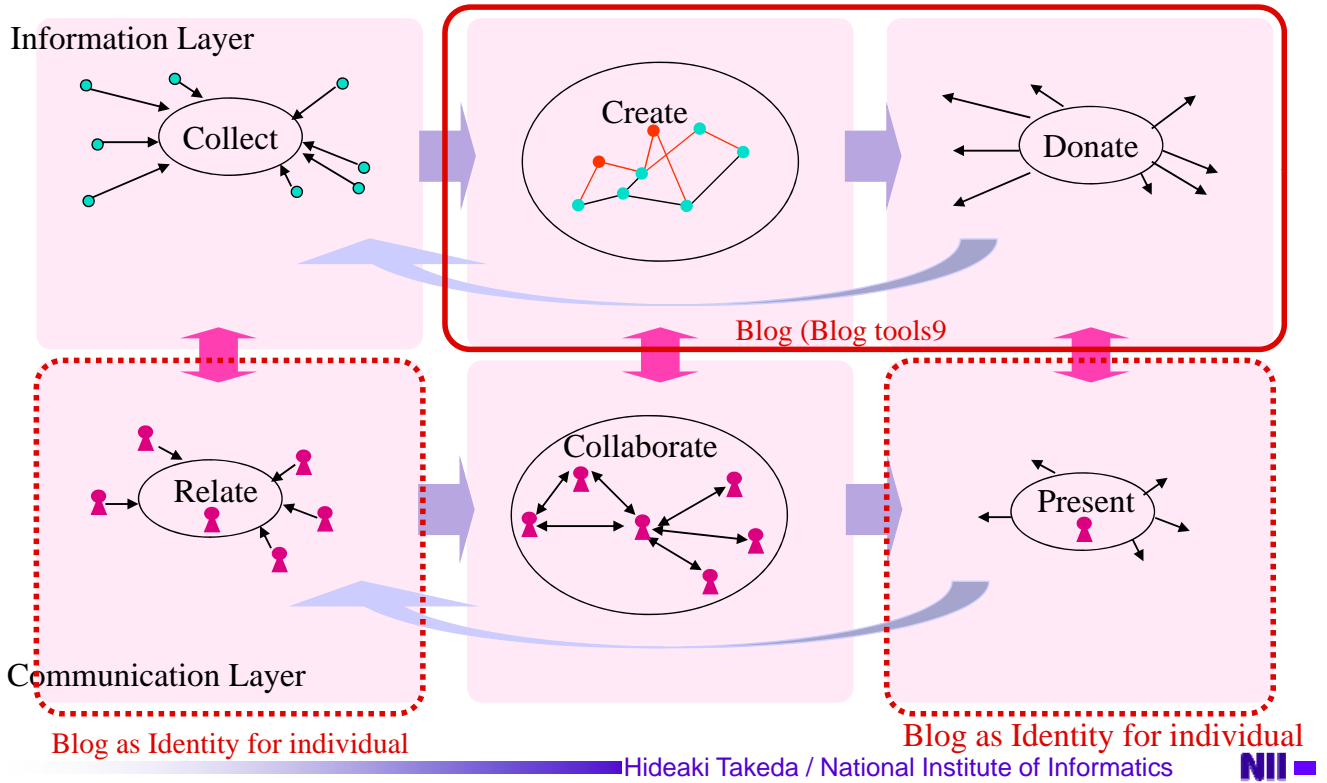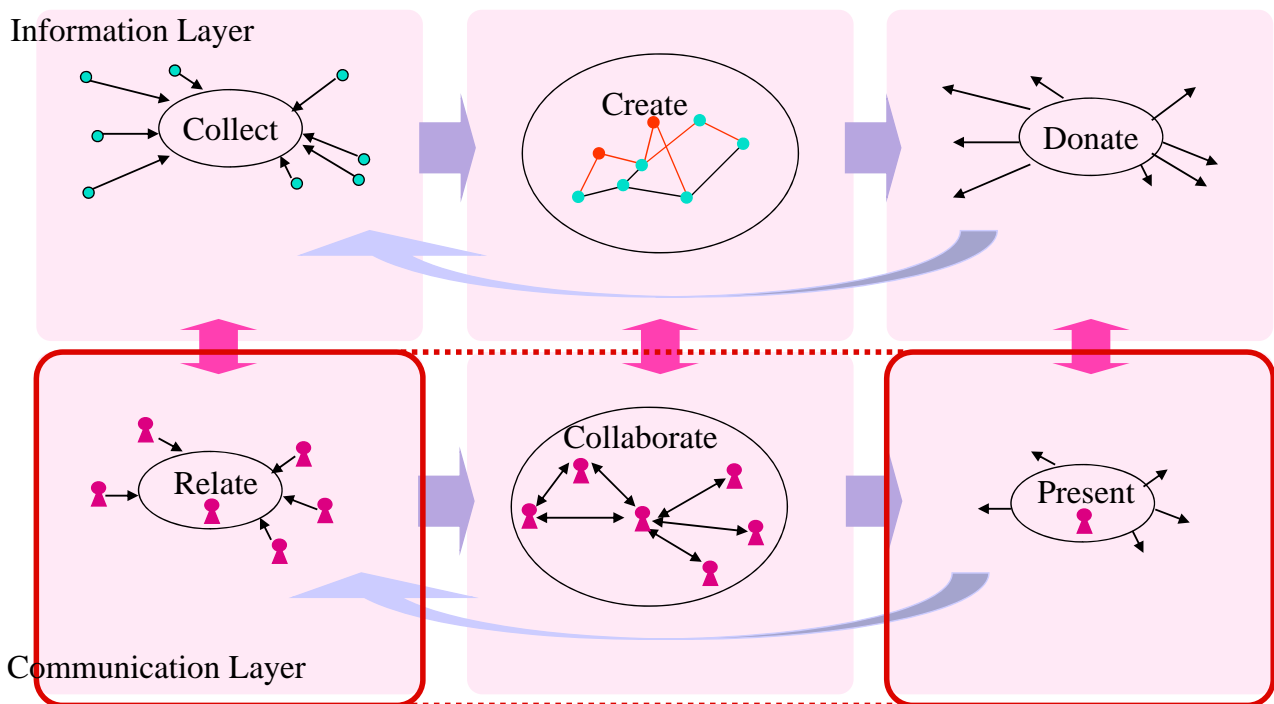 - Pages for groups

Information for Communication

Weblog(Blog)

SNS

Wiki

Blog

- Publishing information through identification over time

Information Layer

Collect

Create

Donate

Blog (Blog tools9

Collaborate

Communication Layer

Relate

Present

Blog as Identity for individual

Blog as Identity for individual

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SNS

- Communication and publishing with personal network

Information Layer

Collect

Create

Donate

Collaborate

Communication Layer

Relate

Present

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wiki

- Publishing with collaboration

Information Layer

Collect

Create

Donate

Relate

Collaborate

Present

Communication Layer
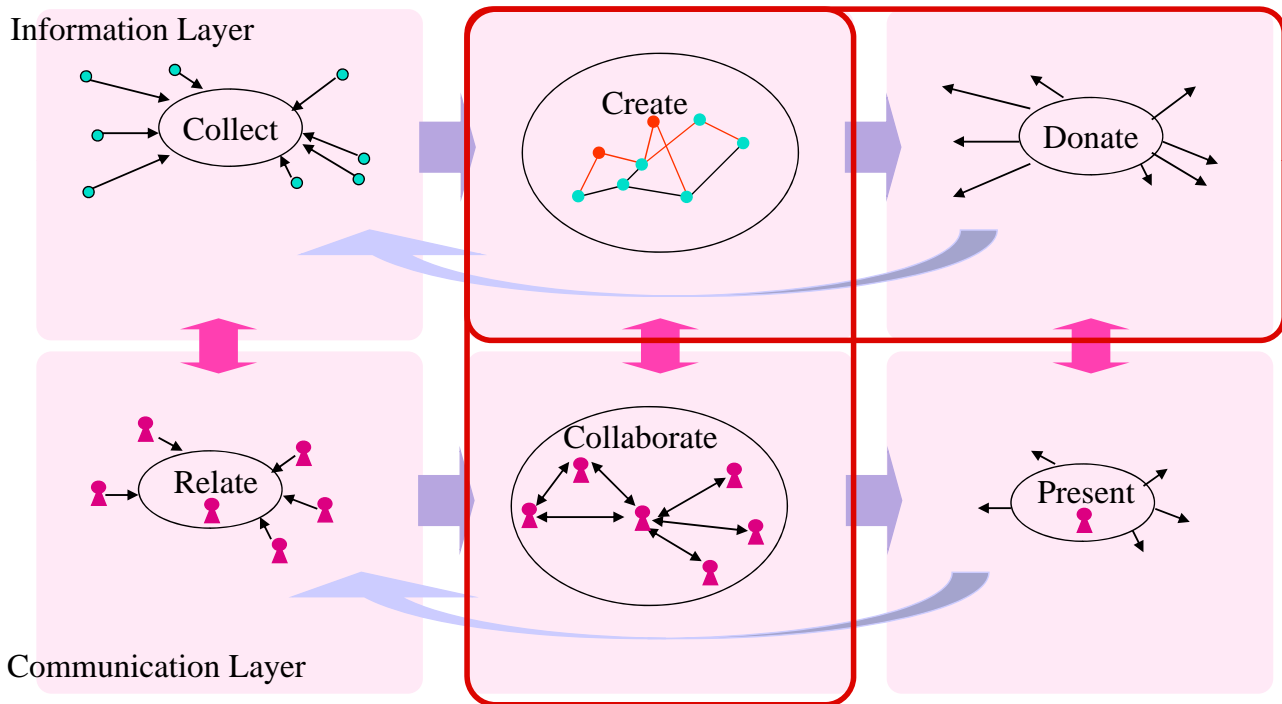
Community Web

- Explicit support for both layers
- Seamless support over two layers
- Compound support over two layers: social media and its extension

Information Layer

Collect

Create

Donate

Social Media

Relate

Collaborate

Present

Communication Layer
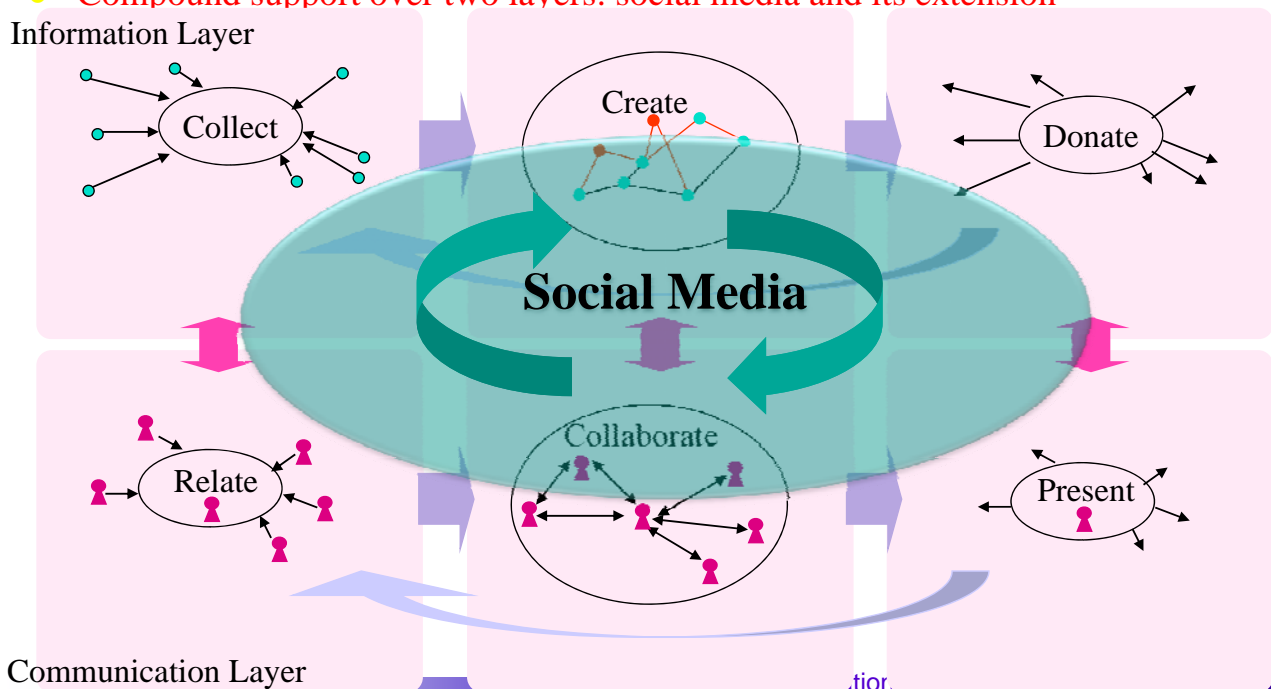
Social Media

- Media consists of interaction among massive participants that are widely distributed in the society.
    - Via Social Network
    - Via Communities
- Examples
    - Mass Media (TV, News Papers) …No
    - Web … No *in general*
    - BBS … Yes
    - Blogs … Yes
    - SNS … Yes
    - Social tagging (Social bookmarking, Social news)… Yes
    - Video Sharing … Yes

Massively Collaborative Creation

- Creative activity through social media
- Examples
    - BBS
    - Q&A Sites (Yahoo! Answers[usa], Yahoo!Chiebukuro[jp], Naver Knowledge iN [kr] …)
    - Wikipedia
    - Nico Nico Douga (Video sharing site) cf. Youtube
- Features
    - Massive participation
    - Generating new contents
    - Interaction affects generation of new contents

Massively Collaborative Creation (cont.)

- Different ways of affections by interaction to content creation
  - Contents = Interaction
    - Interaction logs are used as contents
    - Ex.) BBS, Q&A, etc
  - Interaction influences content generation
    - Content =/= Interaction
    - Contents are generated under the influence of interaction
    - Ex.) Flickr (images vs. tags), Youtube (movies vs. comments),
  - Interaction is embedded into content generation
    - Contents are created collaboratively
    - Ex.) Wikipedia, Nico Nico Douga

What is "*Nico Nico Douga*" ?

- ***Nico Nico Douga*** is the one of the most popular video sharing website in Japan
 - The most interesting function is the direct overlaying of comments on videos

Video

Overlaid comments

Timeline view of user comments

Three types of interaction on Nico Nico Douga

- Embedded interaction on the system
  - Audience and Audience
    - Sharing comments to same video
    - Feeling pseudo synchronization
      - Users feel they watch a video together!
- Emergent Interaction
  - Audience and Creators
    - Good feedback for creators
      - Creators can get pin-point comments from users
  - Creators and Creators
    - Audience become a creator

Hatsune Miku

- *Hatsune Miku* is a version of singing synthesizer application software ("vocaloid")
  - A user can make a singing song by giving a music note with lylic (piano roll)
- It has inspired many people to produce various music, picture, and video compositions
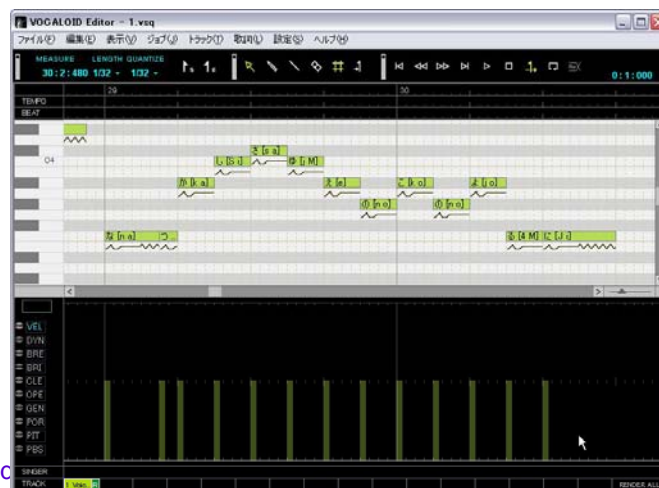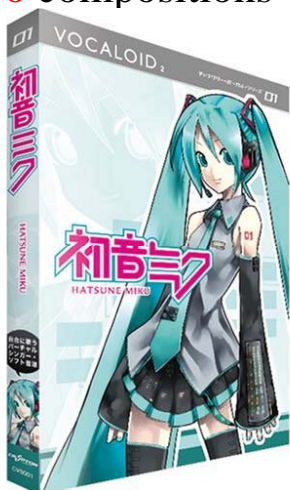
Example!!

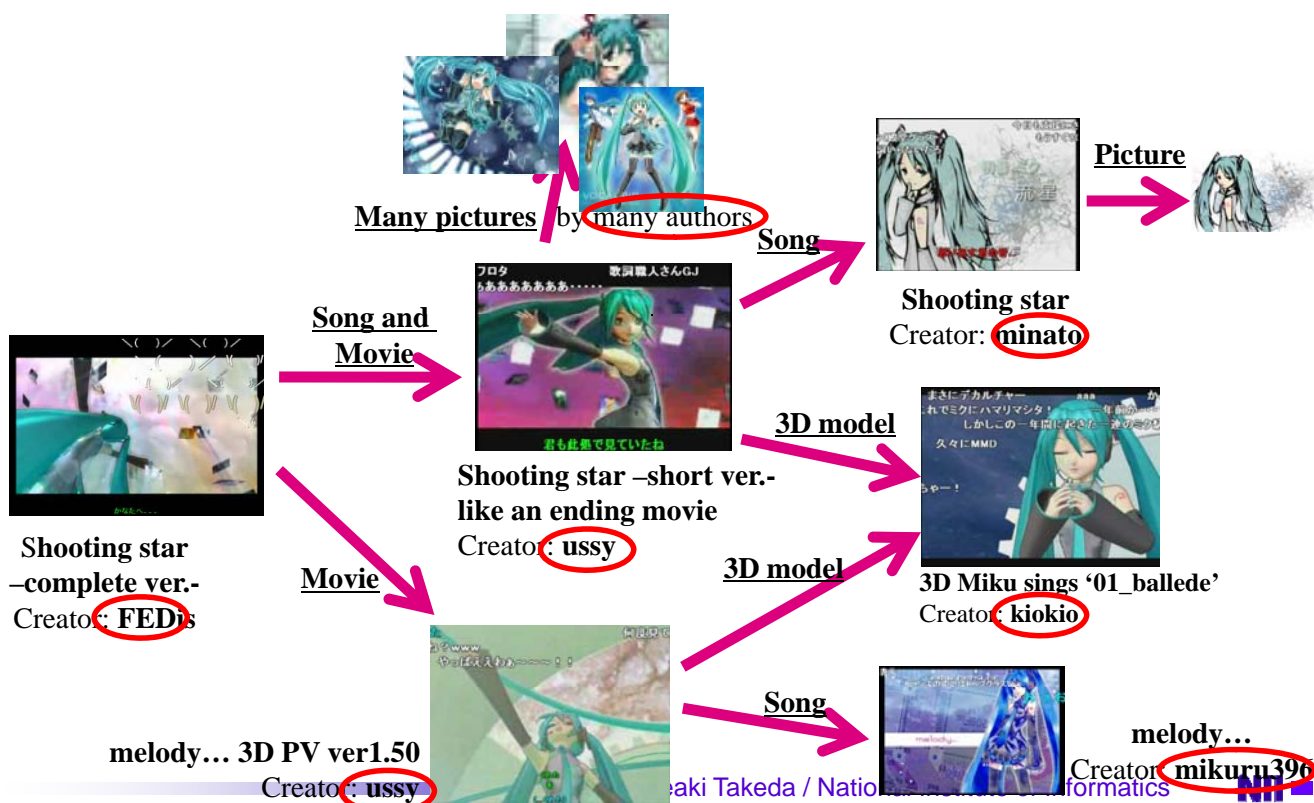- Title: **Shooting star –short ver.- like an ending movie**
- Creator: **ussy**
- URL: http://www.nicovideo.jp/watch/sm2030388

Re-using network on
Nico Nico Douga & Hatsune Miku

Many pictures by many authors

Song

Picture

Shooting star
Creator: **minato**

Song and Movie

Shooting star –short ver.- like an ending movie
Creator: **ussy**

3D model

3D Miku sings '01_ballede'
Creator: **kiokio**

Shooting star –complete ver.-
Creator: **FEDr**

Movie

3D model

melody… 3D PV ver1.50
Creator: **ussy**

Song

melody…
Creator: **mikuru396**

A part of network of re-using relationship among creators using Hatune Miku on Nico Nico Douga
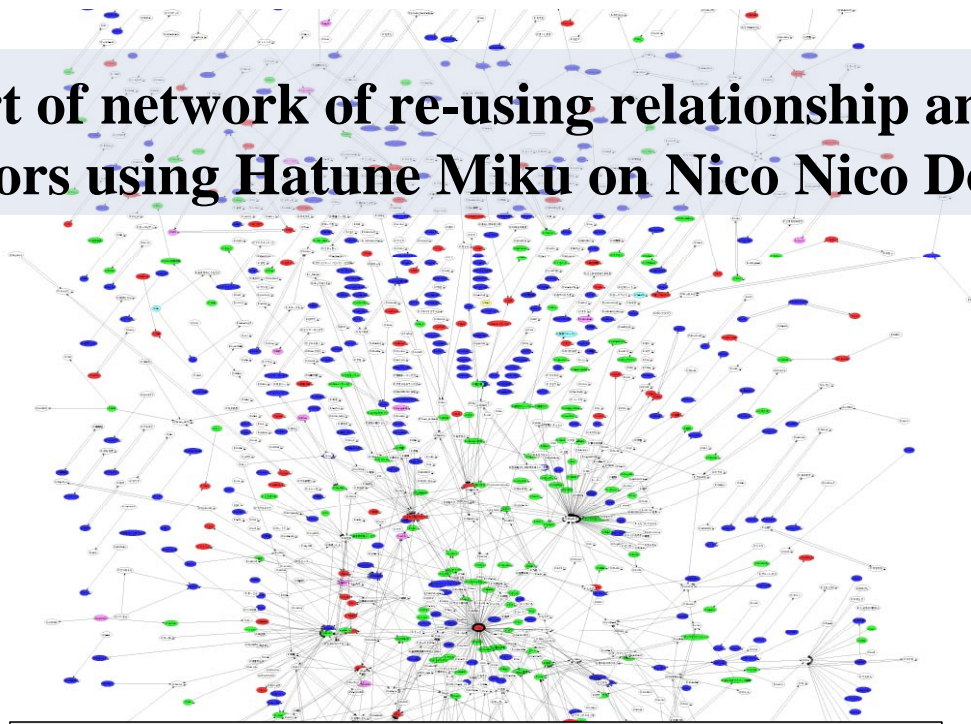
Our interests
- What types of social network do creators have?
- How different types of creators interact to create new content through their social network?

Our approach
- We adopted a method of social network analysis

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Findings

- The creator's network consists of a large and sparse component
- Different categories of creators have different roles in evolving the network
- Creators' behavior is similar to audiences' one
    - It likes Web2.0 style (A consumer is a creator!)
- Some of communities in the network are centralized, and have specific tags
- The characteristic ("a few popular creator and others") becomes stronger with time

Social Data of Hatsune Miku on Nico Nico Douga

- 36,709 videos with tag 'Hatsune Miku' (31 May 2008)

- Select 7,138 videos viewed more than 3,000 times
  - Crawled during 1–5 June 2008
  - The metadata include view times, uploaded date, uploader name, tags, and a description

- 7,138 videos were uploaded by 2,911 unique contributors
  - Note:
    - We regard the uploader as the video creator
    - On Nico Nico Douga, only the uploader is identified
    - The uploader *may not* be the creator of the vide
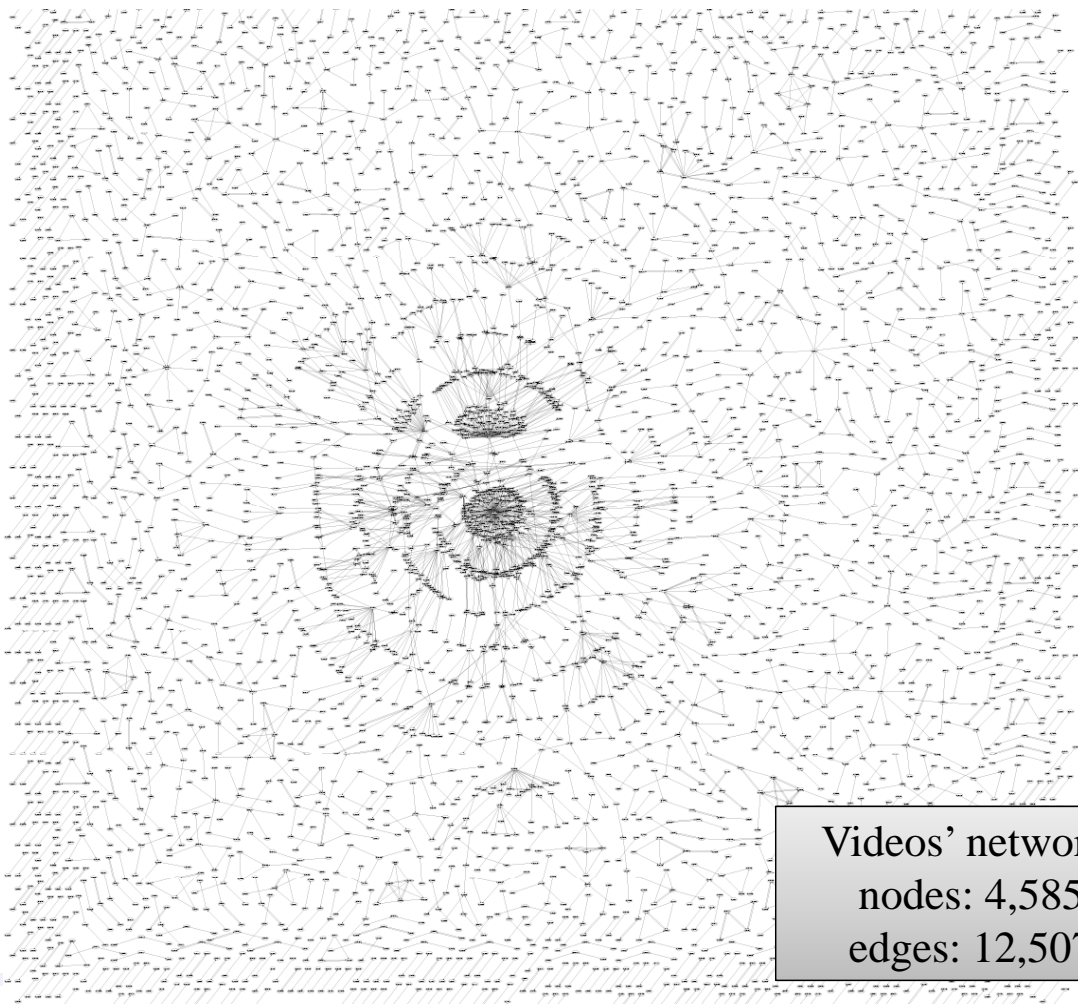
How to make networks among movies

- The description of the movie often includes hyperlinks to other videos showing trail of the video's creation
  - On Nico Nico Douga, a creator often cites other videos if a sound, image, or any part of another video is used as acknowledgement

- By tracing these hyperlinks, we generated a reference network of videos

- Among the collected videos, 4,585 videos include hyperlinks in the description

- Movie network
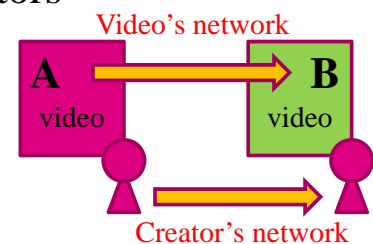 - 4,585 nodes (videos)
 - 12,507 links (hyperlinks)

Videos' network
nodes: 4,585
edges: 12,507

How to make network among creators

- We set a relation from creator of video *A to creator of video B if* video *A has link to video B*
  - *It implies that Creator A uses contents of Creator B*
- In this way, we generated a network among creators

Video's network

A video → B video

Creator's network

- Creators network
  - 2,164 nodes (creators)
  - 4,368 links (relationships among creators)

- We regard this network as a social network of creators
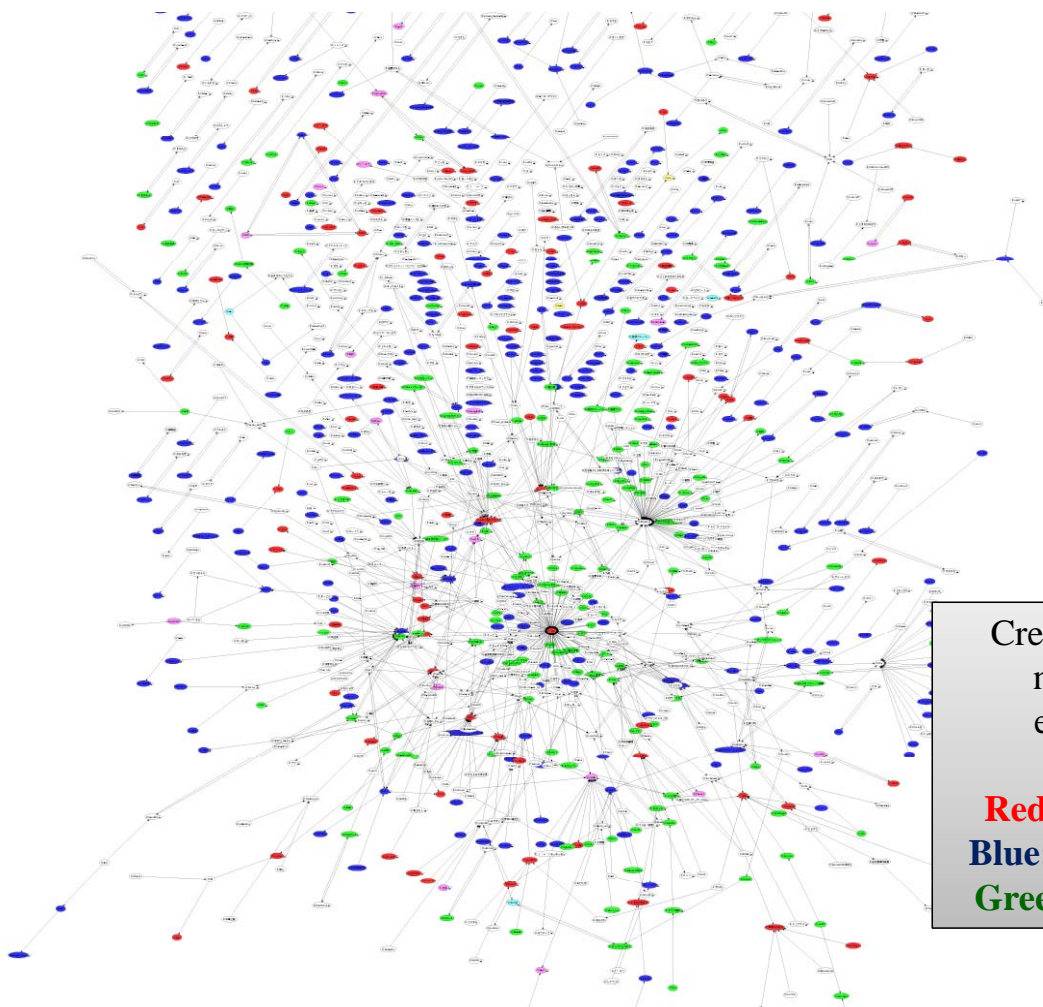
Creators' network
nodes: 2,164
edges: 4,368

Red: Songwriting
Blue: Song creation
Green: Illustration

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Characteristics of the Creators Network

- The network is large and sparse
  - The diameter of this network is 21

- Scale free network
  - A few nodes (creators) gather many links (citation)

$$y = 93.487x^{-1.214}$$

- Network centrality correlated to the number of play times
  - Many cited videos are popular for users
 - Creators' behavior is similar to audiences' one
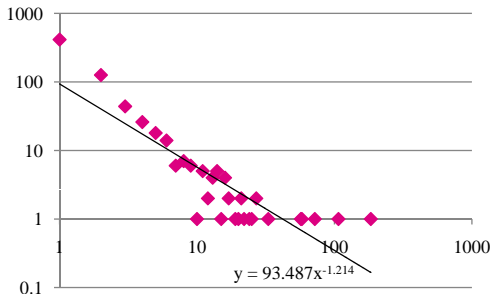
Category of Creation Activity

- We classified creative activities related to Hatsune Miku into four categories:
  - **Songwriting**
    - Create an original song (lyrics and melody)
  - **Song creation**
    - Tune the software to create singing songs
  - **Illustration**
    - Draw pictures, textures, and create 3D models
    - Produce many different scenes and facial expressions
  - Editing
    - Choice videos and package them to one video

- We classify creators semi-automatically using tags on videos

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Relationship among categories of creation

- Many creators re-use **Songwriting creators**' contents

- Many **Illustration creators** re-use others' contents
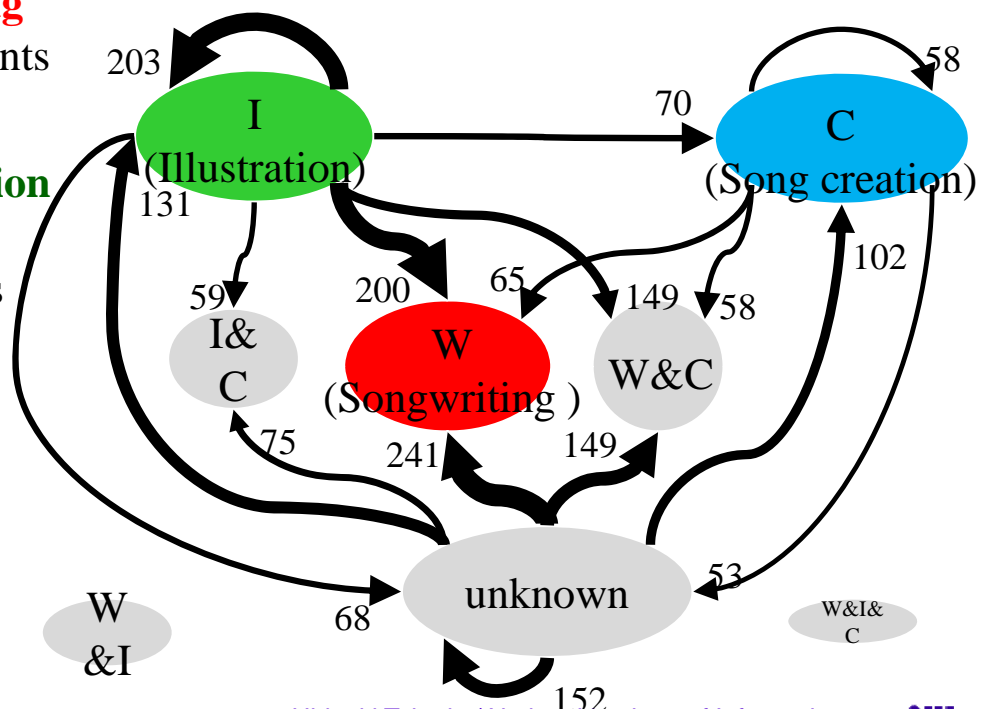
Community on Creators Network

- We analyze the creators' community
  - The term "creators' community" means a tight group of nodes within social network of creators
  - We adopt Newman clustering to detect such communities from the social network of creators

- Newman clustering generated 83 clusters (communities) from the social network of creators
- We especially investigated 7 clusters of which the size is greater than 50
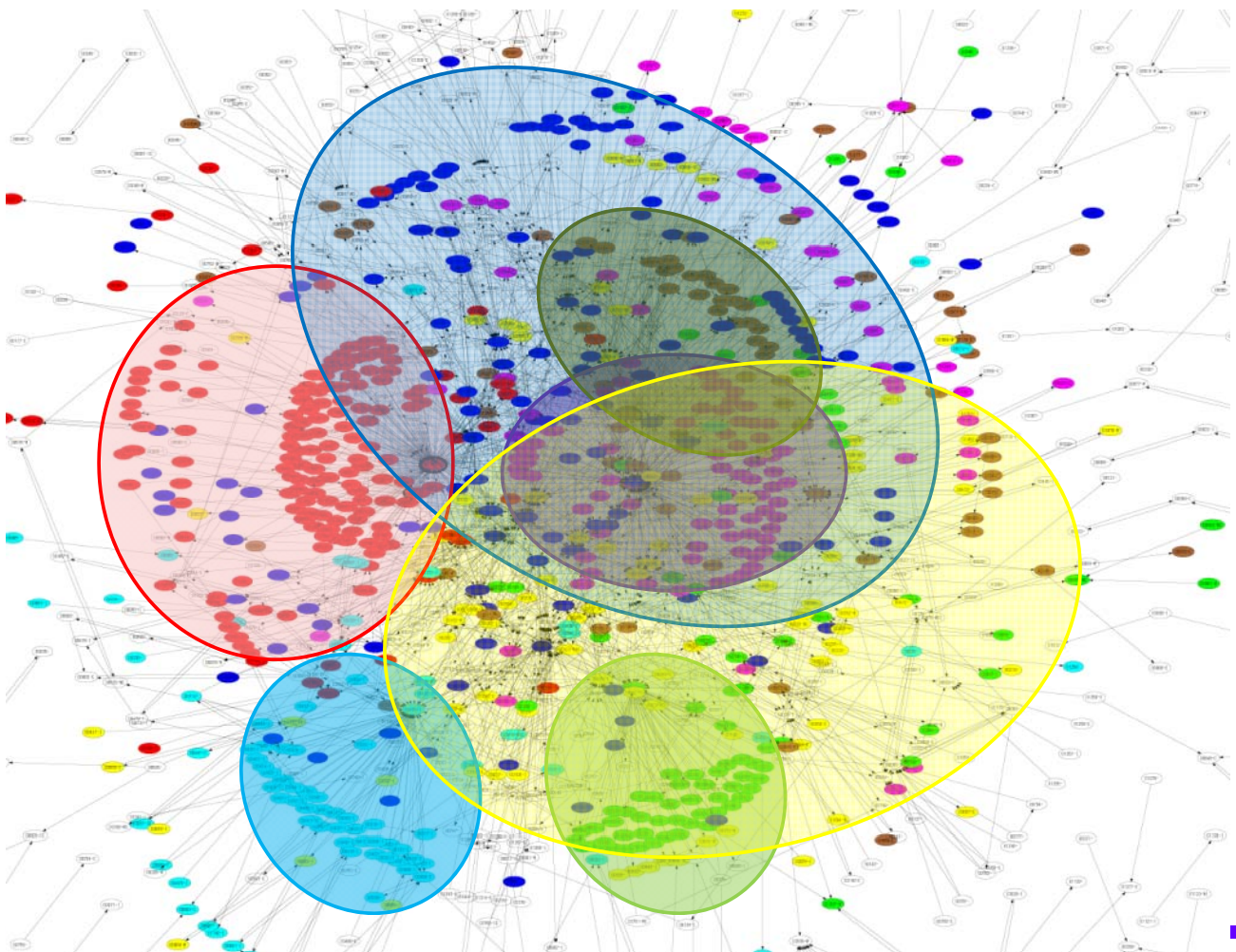
Structure of the biggest clusters

- **Centralizaiton**: an index of the centrality of a network
- **X^2**: a degree of bias of tags in the clusters
- **Key person**: a node that has the most links
  - The number of links of the node should be more than 10 percent of the cluster

#	Size	Centralization	X^2	Key person	Majority
● 1	161	4.293	2130.5	W	I
● 2	144	0.080	1747.3	–	I
● 3	118	5.257	1921.0	I&C	I, C
● 4	95	1.868	1857.7	–	I
● 5	91	5.897	2799.9	I	I
● 6	90	7.055	2333.7	W&C	C
● 7	79	5.164	1942.8	W	C

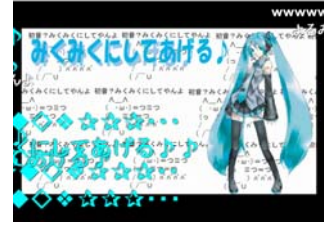**W: SongWriting**, **C: Song Creation**, **I: Illustration**

Structure of the biggest clusters

- Songwriting is often a key person, meaning that Songwriting triggers creative activity
- Centered clusters often have a high degree of bias of tags
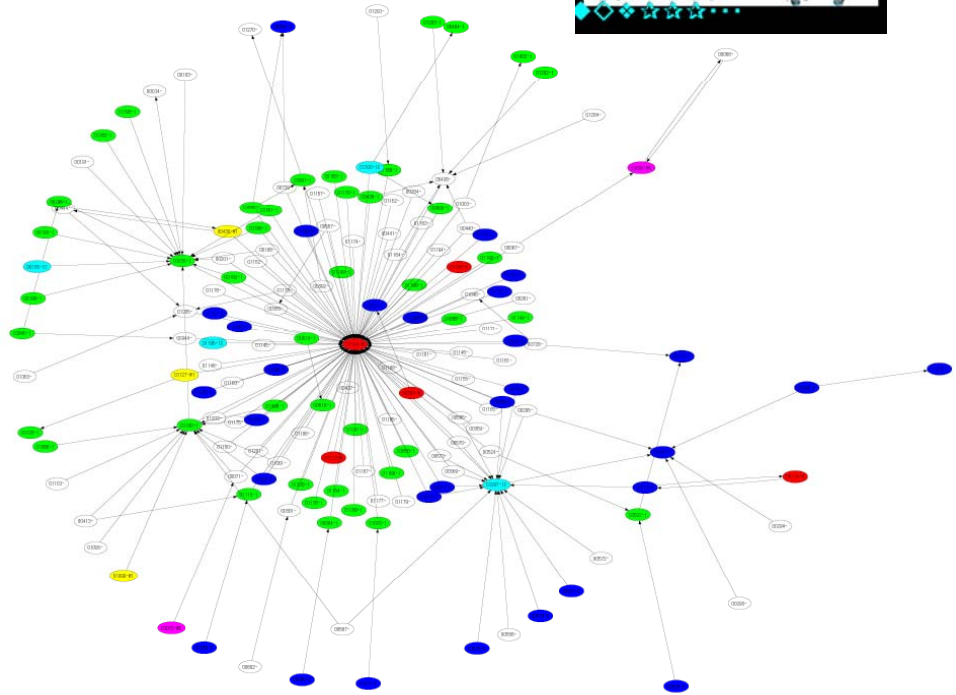 - Centralized community often have community specific tags

#	Size	Centralization	X^2	Key person	Majority
● 1	161	4.293	2130.5	W	I
● 2	144	0.080	1747.3	–	I
● 3	118	5.257	1921.0	I&C	I, C
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● 7	79	5.164	1942.8	W	C

W: SongWriting, **C: Song Creation**, **I: Illustration**
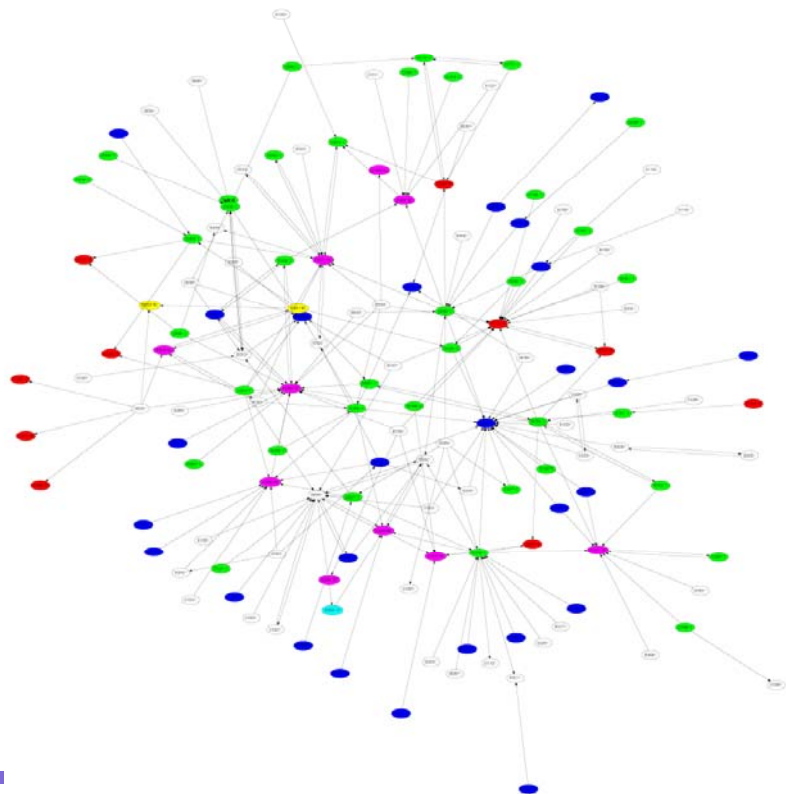
Cluster 1

- Type
  - Centered
- Key person
  - **Songwriting**
- Majority
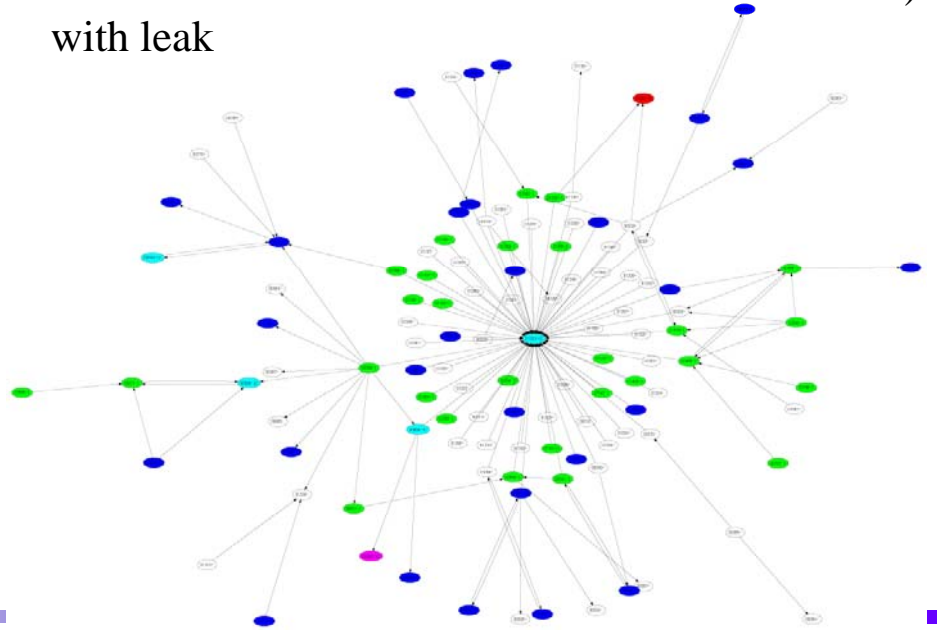 - **Illustration**

Cluster 2

- Type
  - Messy
- Key person
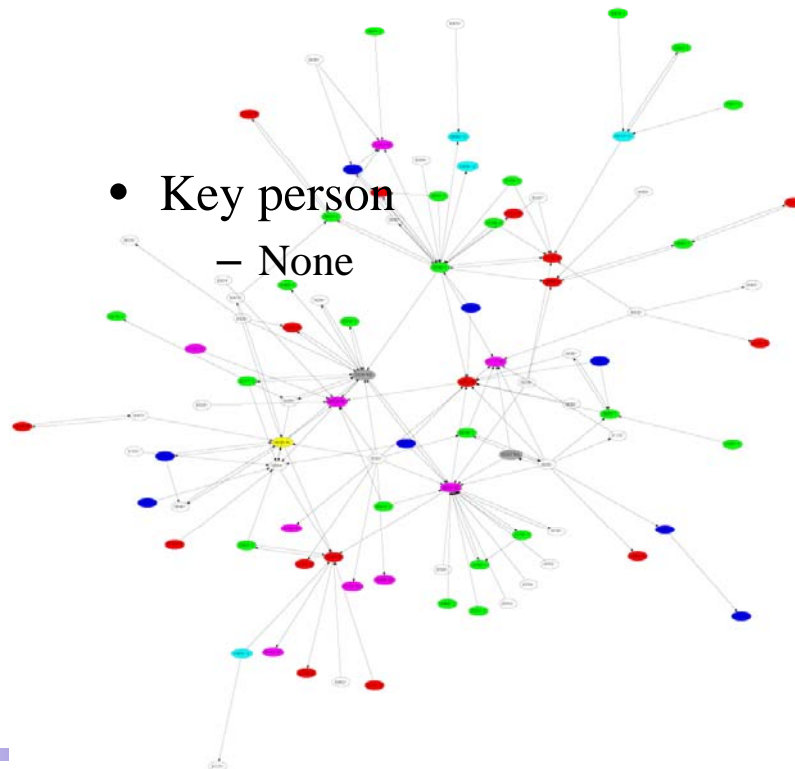 - none
- Majority
  - **Illustration**

Cluster 3

- **Type**
  - Centered
- **Key person**
  - **Illustration** & **Song creation**
- **Majority**
  - **Illustration** , **Song creation**

The key person of this cluster introduced a character called ``Hachune Miku'' (an infantilized version of the Hatsune Miku mascot) with leak
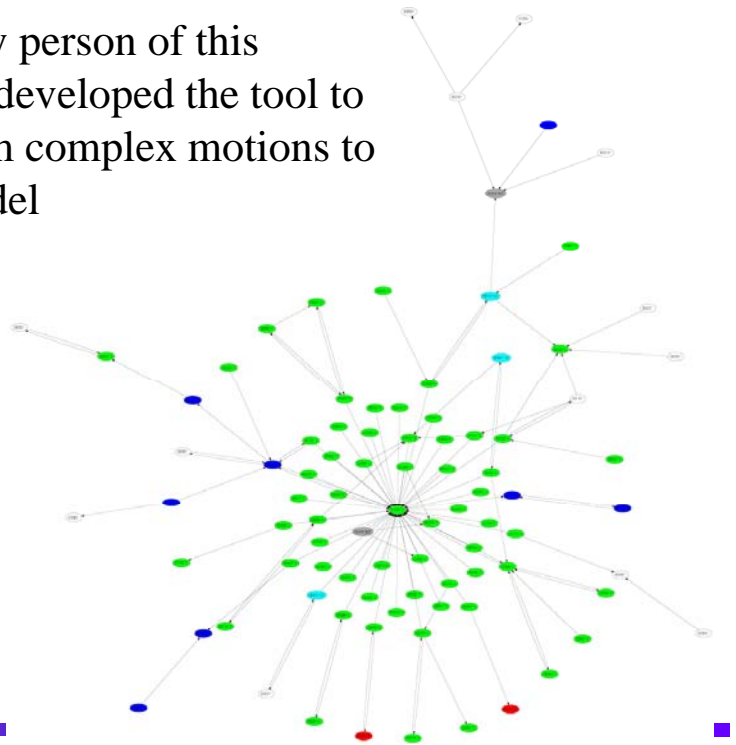

Cluster 4

- Type
  - Messy

- Key person
  - None

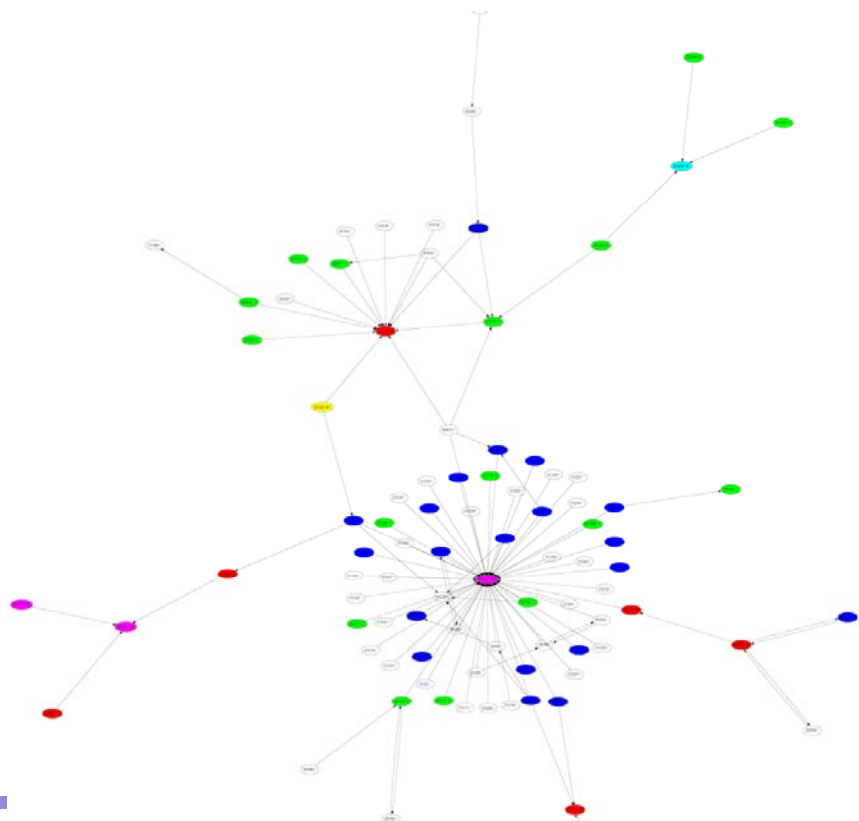- Majority
  - **Illustration**

Cluster 5

- Type
  - Centered
- Key person
  - **Illustration**
- Majority
  - **Illustration**

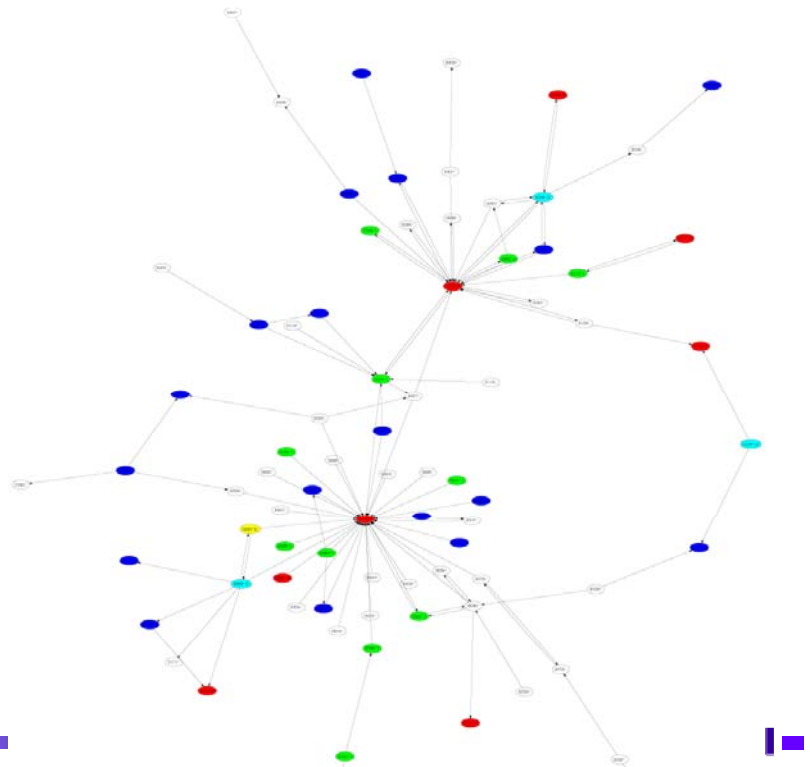The key person of this cluster developed the tool to program complex motions to 3D model

Cluster 6

- Type
  - Centered
- Key person
  - **Songwriting** & **Illustration**
- Majority
  - **Song creation**

Cluster 7

- Type
  - Centered
- Key person
  - **Songwriting**
- Majority
  - **Song creation**

Conclusion

- Our use of Web is shifting
  - Web of Documents: Linking documents is New! Cool!
  - Web of People: Linking people is New! Cool!
  - Web of Creativity: Linking creative activity is New! Cool!
- The model
  - "Community Web" model
    - ◆ 3 Information activities and 3 Communication activities
    - ◆ Creative activity is a composite of the above 6 activities
- Massively Collaborative Creation
  - A new style of creation
  - A natural extension of our use of web
  - A full use of "community web" activities

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