# Idea Relationship Analysis in Open Innovation CrowdSourcing systems

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Grupo de Sistemas Inteligentes
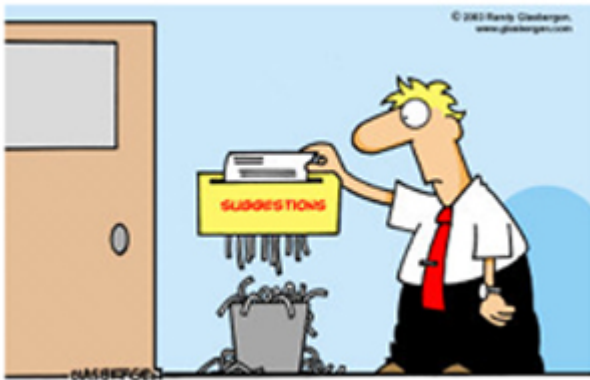Universidad Politécnica de Madrid
http://www.gsi.dit.upm.es

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Outline

- **Idea Management Systems**

- **The problem**
    - too many similar ideas

- **Our solution**
    - idea relationship hierarchy

- **Evaluation**
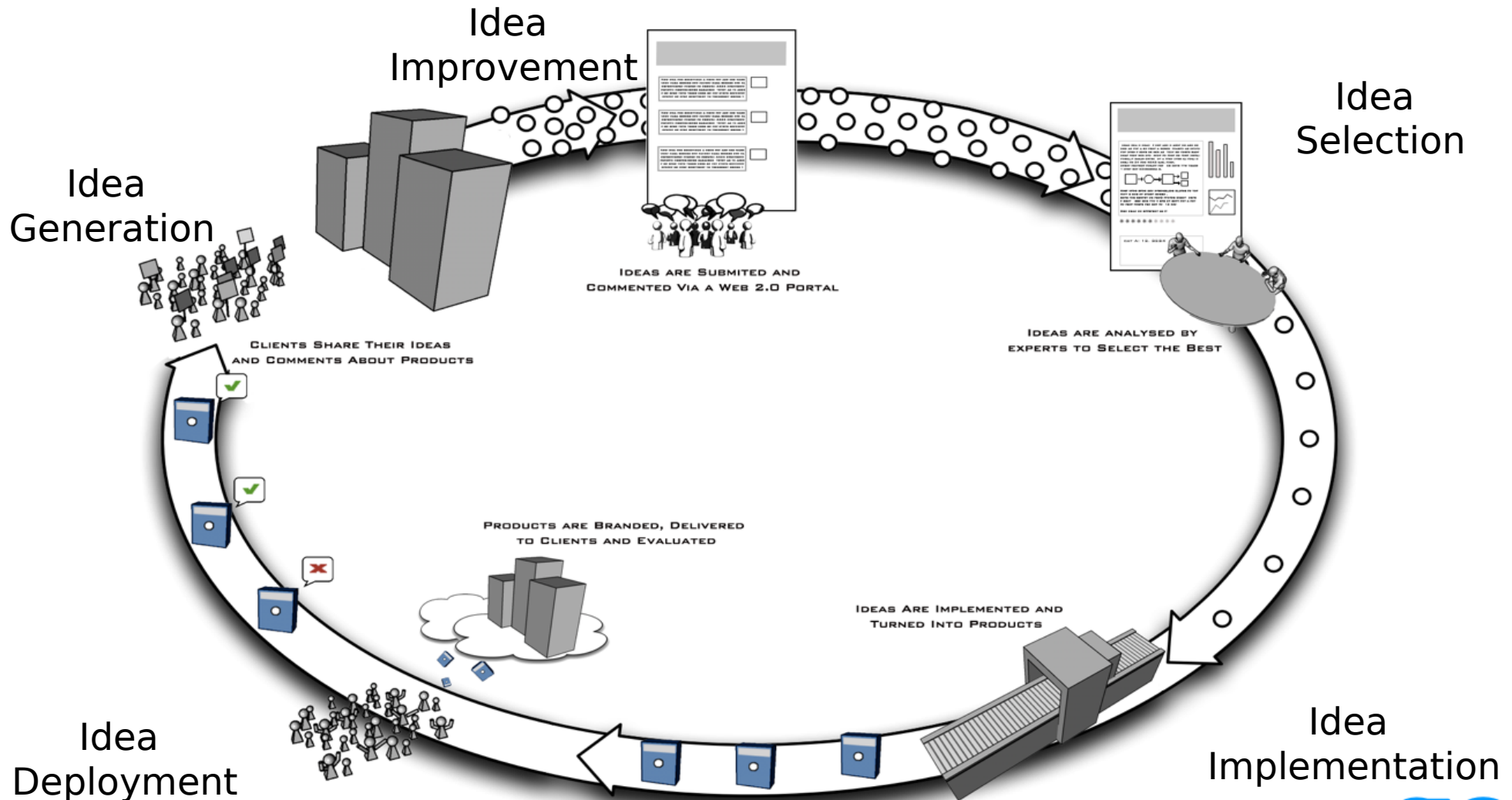   - Ubuntu brainstorm

- **Conclusions**
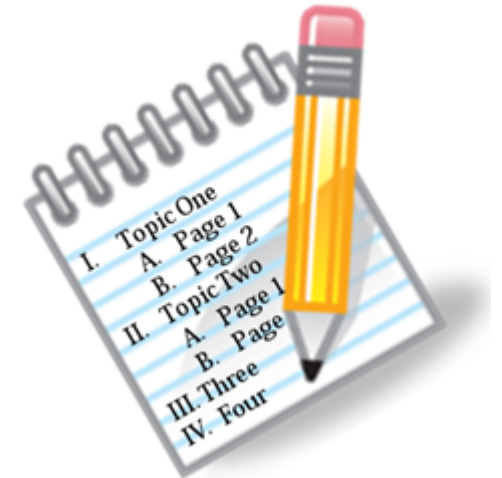
Idea Management Systems

- Evolution of suggestion boxes...

- for open innovation purposes

    - Collect ideas, suggestions, from customers, employees, ...

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Innovation through Idea Management Systems

ubuntu brainstorm

All   **Projects** ∨   **Global categories** ∨

Search...   OK
Advanced search »

☣ **Idea sandbox**   ⚡ **Popular ideas**   ⚙ **Ideas in development**   ✔ **Implemented ideas**

💡 **Submit your idea**

⚡ Here are this month's most popular ideas about Ubuntu. **New to Brainstorm?** Learn how it works!

Most popular in 30 days ∨

The viewing of app images in Software Center is inconvenient.

Written by Vahan Harutyunyan the 21 Sep 12 at 14:11. Related project: Ubuntu Software Center. **New**

When we select the application and press "More Info" button we can get information about the app. A lot of applications have more than one images uploaded by developers. And it's very inconvenient if you want to zoom these images and view them. You have to select one image, zoom it (appears a window), then close the window, select next image, zoome it, etc.
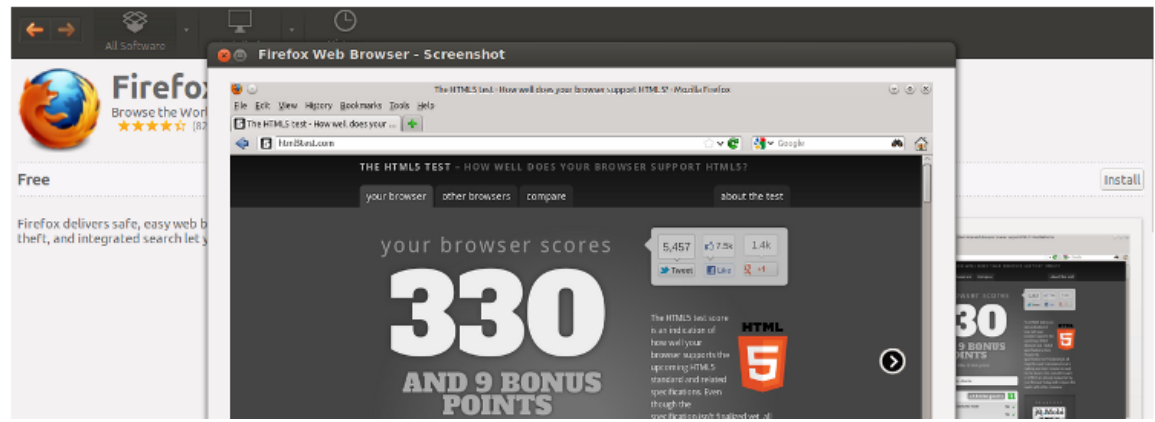
38
votes

Solution #1: Add "arrow" button on the current image.

Written by Vahan Harutyunyan the 21 Sep 12 at 14:11.
When you hover over image the "arrow" button appears and for viewing the next image you just need to press this button.

My Starbucks Idea

Hi there,   Sign In   to make a comment.

Share
Follow us on twitter

Ideas so far

Search Ideas

PRODUCT IDEAS

31,535	Coffee & Espresso Drinks
3,156	Frappuccino® Beverages
9,306	Tea & Other Drinks
14,469	Food
7,502	Merchandise & Music
14,868	Starbucks Card
2,355	New Technology
10,134	Other Product Ideas

EXPERIENCE IDEAS

7,555	Ordering, Payment, & Pick-Up
13,533	Atmosphere & Locations
10,504	Other Experience Ideas

INVOLVEMENT IDEAS

SHARE. VOTE. DISCUSS. SEE.

Share your ideas, tell us what you think of other people's ideas and join the discussion.
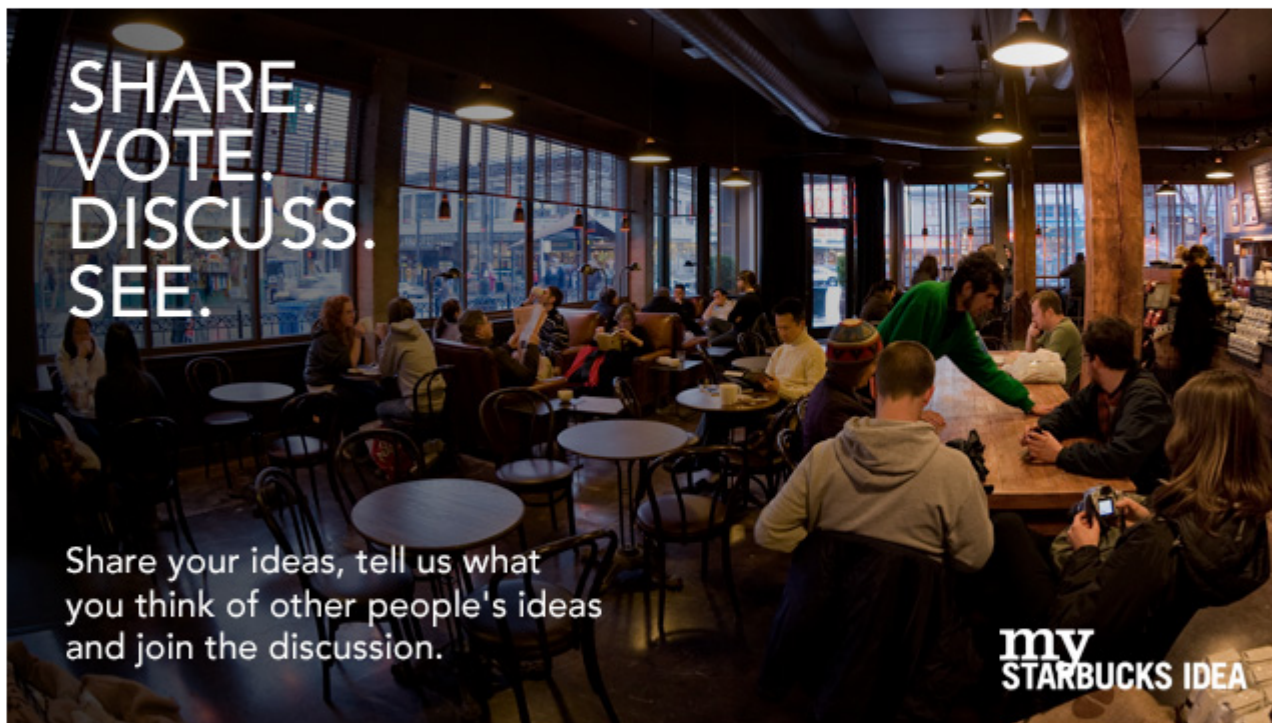
Most Recent Ideas

22 Min(s) Ago	Different card designs for Passbook on iPhone
54 Min(s) Ago	Fun With Tea
1 Hour(s) Ago	Enriching an Elders Life

IdeaStorm can help take your idea and turn it into reality.

SUBMIT YOUR IDEA

OVER **17,894** IDEAS SUBMITTED. **738,876+** VOTES. **96,905+** COMMENTS. **515+** IDEAS IMPLEMENTED.

Featured

1 / 2 / 3 / 4 / **5**

Sell ARM based systems

Posted by: shiningarcanine

Intel based systems are power hungry and with rising energy costs, many people are realizing that th ...

Learn More

6 Votes | **3 Comments**

Recent Ideas

Explore More

please put android on the ARM version of the dell xps duo 12

Posted by: bcruz111
Status: New
Oct 4, 2012

I love the dell xps duo but i really do not like windows 8,

Trending Ideas

Explore More

Design idea

Posted by: Hto005
Status: Acknowledged
Oct 3, 2012

Well, to be honest and all: I hate Dell computers. why?

Top Recent Contributors

Show More

phubert
15625	Points
359	Ideas
5501	Votes

Last Activity : Aug 17, 2012
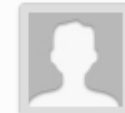
winoffice
8017	Points
108	Ideas
1175	Votes

Last Activity : Jul 9, 2012
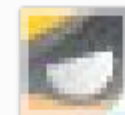
aikiwolfie
5130	Points
104	Ideas
2390	Votes

Last Activity : May 27, 2012
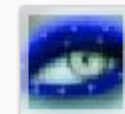
sugarbear   *Rockstar*
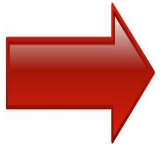| 4134 | Points |
| 51 | Ideas |
| 15701 | Votes |

Goal: improve how ideas are automatically filtered

Our research so far

- Define Gi2MO ontology for formalising and interlinking idea management systems (IMS)

- Connect ideas with Enterprise systems following the Linked Data model

- Integrating Opinion Mining techniques with IMS

- Idea Classification, filtering and analysis of idea similarities independent of idea topic (this talk!)

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Our research so far...

- Software released as open source, everything available at http://www.gi2mo.org

The problem

- Too many ideas to be analysed

- Many ideas are similar

Is it easy to define what is 'similar'?

Similar ≠ Equal

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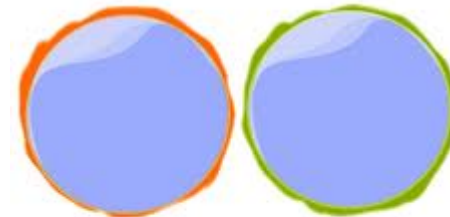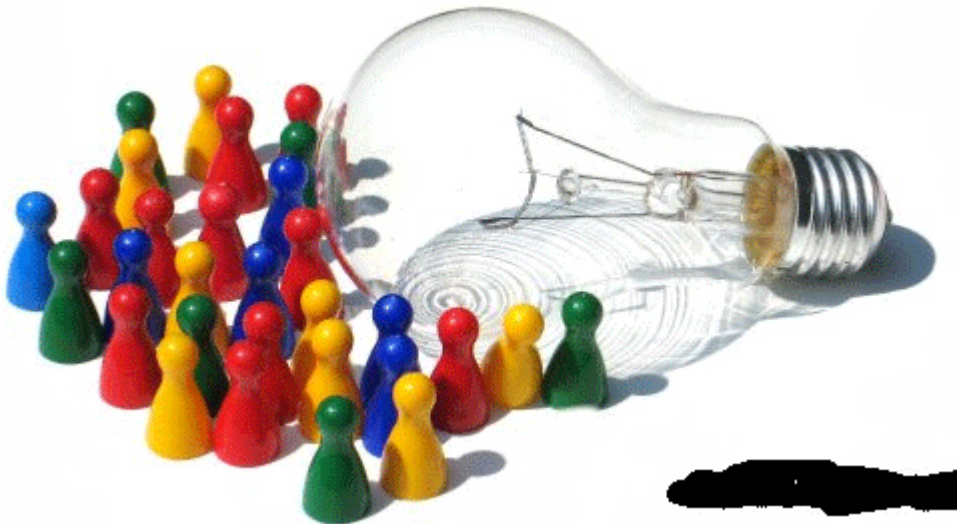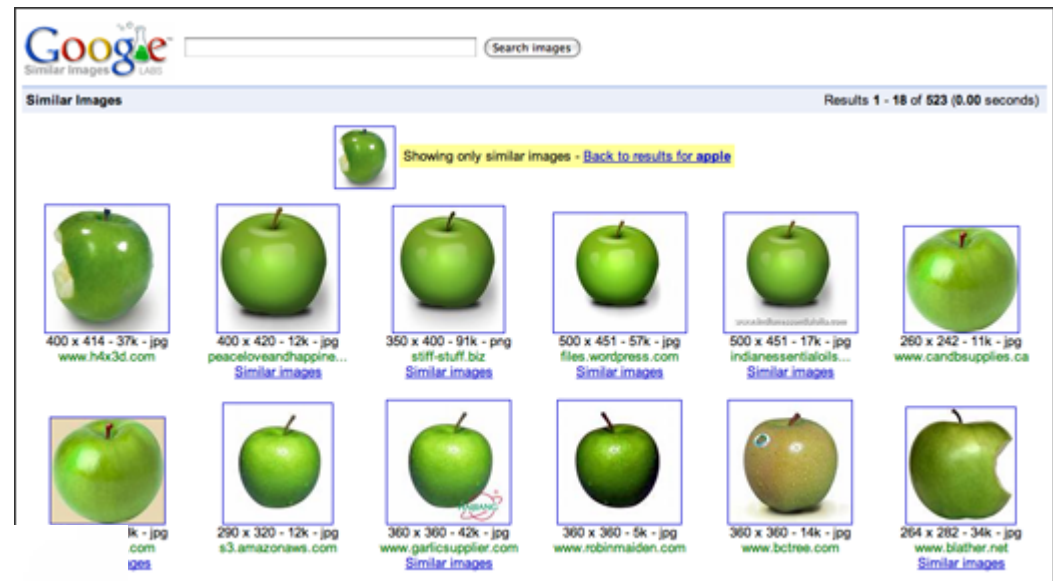
Some examples...

SIMILAR = DUPLICATE

Include Search String in Brainstorm Results Page

View   Voting details   Edit   Workflow   Access control   Reviews   **Similar Ideas**   Devel

Alt_idea Ideas (0)	Alt_solution Ideas (0)	Complements Ideas (0)	Details Ideas (0)
Disjoint Ideas (0)	Duplicates Ideas (1)	Excludes Ideas (0)	Extends Ideas (0)
Generalizes Ideas (0)	Iss_duplicated Ideas (0)	Iss_extended Ideas (0)	Related_topic Ideas (0)
Similar Ideas (0)

Duplicates Ideas:

○ **Brainstorm** 🛈 🗑 : [--Change Relationship-- ▾]

Brainstorm
**When you search for some words in Brainstorm - you get the
result, but nowhere on the page you can see what you were
searching for. Sometimes I have two or three tabs open with
searches, and I don't r(...)**

Save

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… examples

Ubuntu LIVE CD Instructions / Marketing Info For Potential User

Category
Uncategorised

0 votes

DRAFT

Sent by on 11/19/2008 - 05:38

Status: Draft

Tags:

Categories:

Same topic, CD, but different ideas (disjoint)

+ -

Make available a downloadable printable properly formatted document for inclusion with a freshly burned (md5sum checked, and verified) Ubuntu LIVE CD to be given to a potential new Ubuntu user (who may not even know what Ubuntu or Linux even is.) Following is what I folded up with a LIVE CD I gave to a coworker who is frustrated with windows and is considering purchasing a Mac. This makes it gentle encouraging with no preaching needed (best chance I would bet): This is an Ubuntu Linux "LIVE" CD meaning that the linux operating system and all of the included software runs strictly off the CD. This gives the user the opportunity to "test drive" linux without modifying their existing system in any manner whatsoever. To use it, first make sure that the BIOS is set

potential user

Reviews   Similar Ideas

eas (0) | Details Ideas (0) |
(0) | Extends Ideas (0) |
eas (0) | Related_topic Ideas (0)

Ubuntu LIVE CD instr

⊙ **Restoring the bootloader by Ubuntu installation CD** ℹ️ 🗑️ : --Change Relationship-- ▼

Save

Restoring the bootloader by Ubuntu installation CD
If I install Windows after Ubuntu, it's impossible to boot Ubuntu until I install again GRUB following several instructions. My idea is adding the option "Restore bootloader" in the list which appears(...)
**Author:**

Proposal: similarity relationships

|	
A Based on knowledge	Relationship existing between knowledge content of ideas created independently
A1 Similar	Ideas similar to each other
A1.1 Describes Same Object	Ideas that propose a similar innovation for the same item
A1.1.1 Extends	One idea extends other
A1.1.1.1.1 Complementary	Ideas that can work together
A1.1.1.1.1.1 Details	One idea focuses on part that other neglects
A1.1.1.1.1.2 Generalizes	One idea describes a more broad vision of other
A1.1.1.1.2 Excluding	Implementations of ideas exclude each other
A1.1.1.1.2.1 Alternative Solution	Ideas refer to the same object and problem but solved in different ways
A1.1.1.1.2.1 Alternative Idea	Two completely distinct ideas that in effect are impossible to implement together
A1.1.2 Duplicates	Ideas describe exactly the same innovation
A1.2 Describes Related Object	Ideas that propose innovation for different objects that are somehow related to each other
A2 Disjoint	Ideas not having any meaningful similarities
B Based on Action	The relationship is created by an action operating on both ideas by a user of the system
B1 Based on Moderator Action	Action taken by moderator of the system in reaction to submitted ideas and relationship annotations
B1.1 Follows	Implementation of an idea should follow some other idea
B1.2 Proceeds	Implementation of an idea should proceed some other idea
B1.3 Merged	Two ideas merged into a single one
B2 Based on Innovator Action	Relationships created based on user interaction with ideas
B2.1 Originates	Ideas created by extending some other idea
B2.2 Is version	Created by updating an idea (e.g. in reaction to community feedback)
B2.3 References	One idea referencing other idea (or resource from outside the system)

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Proposal Similarity Relationships
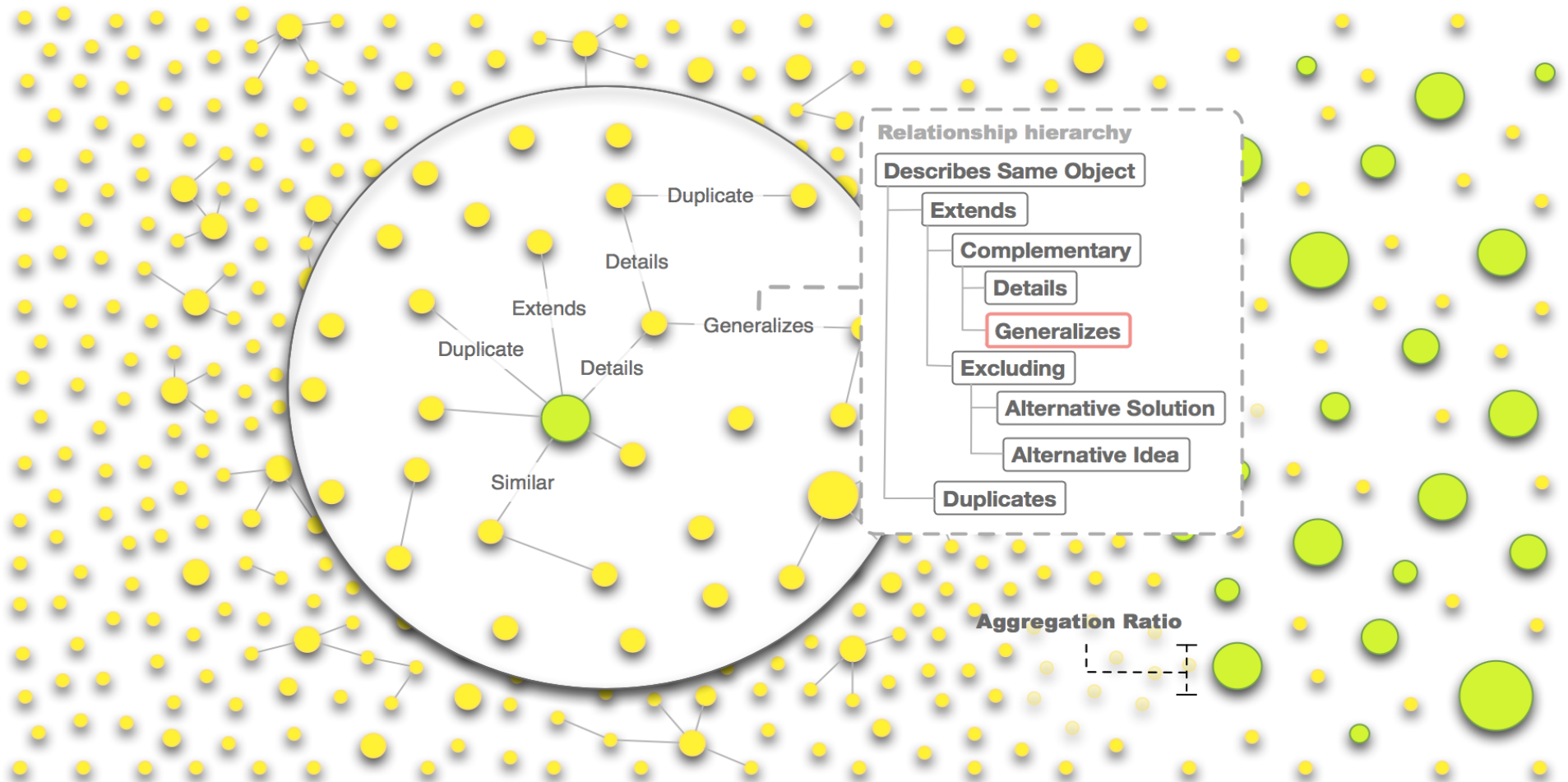
Evaluation methodology
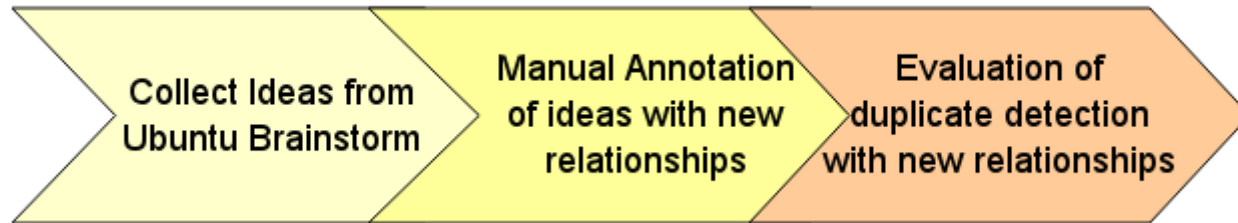
Metric	Metric Value
Idea number	21690
Comments number	133090
Users number	10062
Implemented Ideas number	576
Amount of Votes cast	2608917

Semantic scrapper, available at
http://www.gsi.dit.upm.es/index.php/en/software/details/1/2/software-scrappy.html

Manual annotation

Experiment I

- Goal: determine if all the relationships are useful, apart from duplicate relationship

- We compare our manual annotation with the annotation of duplicate available in Ubuntu Brainstorm

Results Experiment I

- 76.7% new relationships compared with the original IMS

COMPARISON OF RELATIONSHIP COUNT ACROSS DIFFERENT
EXPERIMENTS (200 IDEAS ANNOTATED, 5 RELATIONSHIPS MAX. PER
EACH, NO INHERITANCE OR TRANSITIVE RELATIONSHIPS REASONING)

Ubuntu Brainstorm

Duplicate	249

Gi2MO Relationships

total 440 (328 without duplicates)

similar	4	disjoint	558
related object	111	extends	2
is extended	3	complements	0
details	136	generalizes	27
excludes	0	alternative solution	19
alternative idea	26	duplicates	112
is duplicated	0		

Experiment II

- Goal: new relationships help to identify duplicates and reduce the data set

- We compare

  - Detected duplicates in Ubuntu

  - Detected duplicates in our dataset based on the new relationships

    - 200 ideas with 5 manual annotations suggested by Lucene

  - Same as before but taking into account the hierarchy

Results II

- Ubuntu: 1.13% of duplicate ideas of entire dataset

- Data set with relationships: 0.5%

- Data set with relationships + hierarchy: 1.95%

Relationship	No Inheritance		Inheritance	
	No Transitivity	Transitivity	No Transitivity	Transitivity
Similar	0.02	0.02	2.85	**3.37**
Related Object	0.72	0.75	0.72	**0.75**
Extends	0.01	0.01	1.39	**1.52**
Complements	0	0	1.06	**1.18**
Details	0.87	0.90	0.87	**0.90**
Generalizes	0.18	0.21	0.20	**0.21**
Excludes	0	0	0.29	**0.30**
Alternative Solution	0.12	0.12	0.12	**0.12**
Alternative Idea	0.17	0.18	0.17	**0.18**
Duplicates	0.71	0.71	0.71	**0.73**

Experiment III

- 558 out of 1000 ideas are not related each other (so, they are not similar)

- Analyse similarity based on other annotations:

  - Trigger type
  - Innovation type
  - Proposal type
  - Object type

Gi2MO Types

Idea Title: More buttons on the tablet.

Idea Summary:
I would like to propose adding more physical buttons on the 9 inch tablet that is currently available in your offer. When using the tablet I feel that the single 'home' button is not enough for many activities that the tablet is advertised for making the experience bad.

For example, for reading ebooks, it would be very useful to have "back" and "forward" buttons for scrolling pages of the book. I own a e-paper reader and I think those buttons could be also used for different activities (for example web browsing or games).

Trigger
Observation Type	Faulty Experience
Creativity Origin	Object Interaction
Associated Object	Other Object	Object Relation	Competitive
Associated Object	Other Object	Offering Placement	Other Party

Innovation
Target Audience	Existing Audience
Originality	Incremental	Additive
Relative to	Current State	Organisation	Product Line

Proposal Type
| Request |

Object
History Relationship	Evolutionary
Structure	Element
Type	Product	Specific Product
Offering Placement	Existing	Additive

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Results Experiment III

- Calculated similarity S between two related ideas (i_A, i_B) for 50 ideas for Metric M_x

$$S(i_A, i_B, M_x) = 1 - |M_x(i_A) - M_x(i_B)|$$

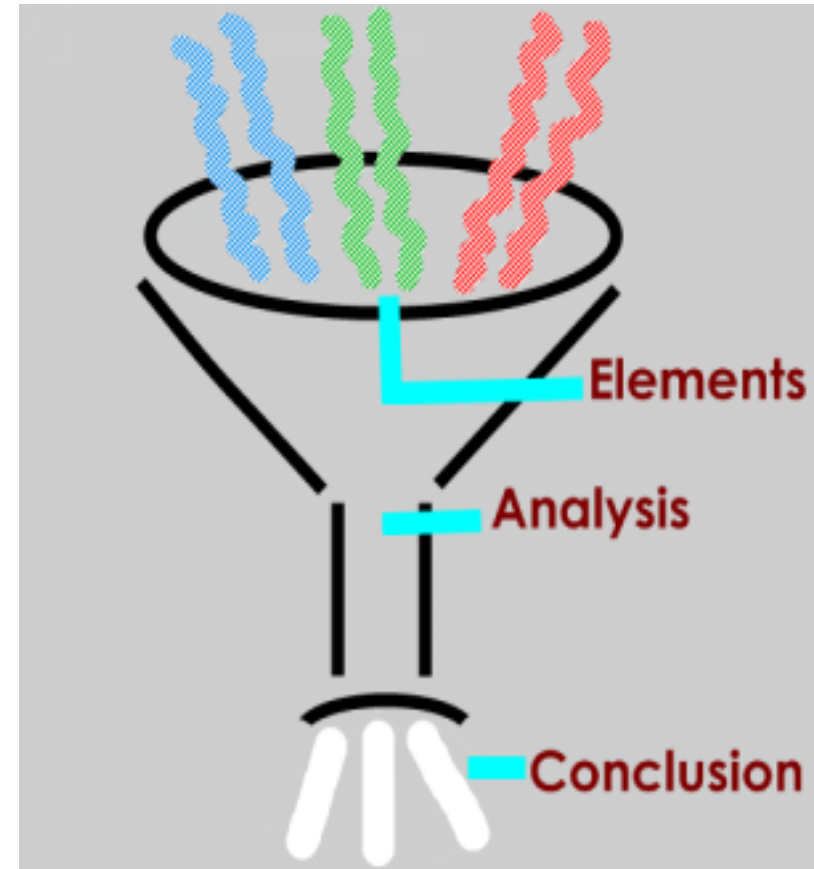| Metric/Relationship	Similar	Disjoint	Duplicate	Related Object	Extends	Complements	Excludes
Completeness	**0.18**	**-0.19**	0.08	0.03	**0.11**	0.08	0.07
Experience Completeness	-0.04	0.06	0.07	0.01	-0.09	-0.07	-0.04
Situational Dependence	0.01	-0.03	0.02	0.05	-0.04	-0.05	0.01
Relatedness	0.01	-0.02	0.11	-0.04	-0.07	-0.02	-0.08
Adaptiveness	**0.18**	**-0.20**	0.01	0.01	**0.18**	**0.12**	**0.11**
Originality	**0.15**	**-0.17**	0.06	0.05	0.09	0.05	0.07
Originality Scope	0.06	-0.01	0.08	**-0.14**	**0.13**	0.06	-0.05
Cooperativeness	**0.14**	**-0.14**	**0.12**	0.03	0.04	0.06	-0.02
Freshness	0.09	-0.09	0.01	**-0.11**	**0.15**	**0.10**	0.09
Integrability	**0.24**	**-0.25**	0.08	0.02	**0.19**	**0.16**	0.07
Applicability Scope	**0.14**	**-0.14**	-0.01	0.01	**0.10**	-0.06	0.08
Constructiveness	-0.02	-0.01	0.01	-0.05	0.00	**0.14**	0.08
Scope	**0.11**	**0.13**	-0.01	0.09	0.07	0.09	-0.02
Object Dependability	**0.24**	**-0.21**	-0.01	0.01	**0.25**	**0.21**	**0.11**

Analysis

- Same correlation in similar and disjoint idea subsets with the analysed metrics
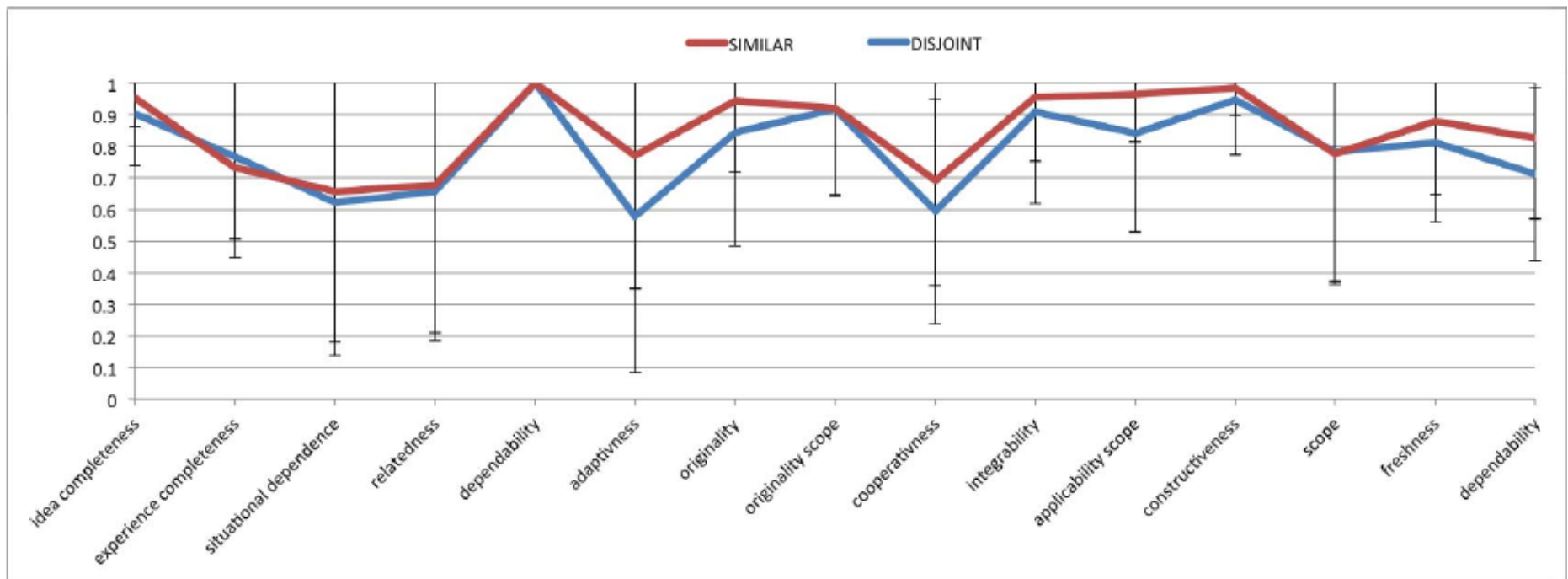
Conclusions

- Semantic relationship can improve the detection of similar ideas

- Relationship hierarchy and transitivity improve similarity detection

- Other annotations (Gi2MO types) and associated metrics do not help for detecting similar ideas

Questions?