

opencare

Deliverable 5.4: Implementation and integration of SSNA software prototypes into a dashboard environment, incorporating the research on semantic networks into the OpenCare platform

<i>Project Acronym</i>	OPENCARE
<i>Title</i>	Open Participatory Engagement in Collective Awareness for REdesign of Care services
<i>Project Number</i>	688670
<i>Work package</i>	WP5 – Data processing for aggregating collective intelligence processes
<i>Lead Beneficiary</i>	UBx — University of Bordeaux
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<i>Dissemination Level</i>	Public

<i>Contractual Delivery Date</i>	31/08/2017
<i>Actual Delivery Date</i>	15/09/2017
<i>Version</i>	1.0
<i>Status</i>	

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Introduction

This document is a *companion* to deliverable 5.4. The deliverable itself consists in code produced to implement a framework supporting the exploration and visual analysis of the online discussion content as a network of interacting users. For that precise reason, and just as the previous deliverables for WP5, this document shows a “milestone nature”.

Deliverable 5.4 consisting of code and software resources are available on two git repositories:

- github.com/opencarecc/graph-ryder-dashboard
- github.com/opencarecc/graph-ryder-api

Technical documentation is also available on github ¹.

Discussions around features of the framework took place on the edgeryders.eu online forum. The git repo also hosts team communication about technical issues.

A series of weekly walkthrough tutorial have been organized and publicized to anyone interested (on edgeryders.eu) in order to amplify the use and adoption of GraphRyder. These online demo sessions took place in June/July 2017 to promote the use of the framework by non-expert users, partly to prepare a workshop session to take place during the Open Village event organized in Brussels in October (see festival.edgeryders.eu/day-2/).

That being said, the framework has been deployed early during the opencare life cycle to collect feedback and favor improvements and debugging through short development iterations.

GraphRyder is now accessible from the URL graphryder.opencare.cc

¹ See :

- github.com/opencarecc/graph-ryder-dashboard
- github.com/opencarecc/graph-ryder-api

This document goes over functionalities supporting user tasks that were identified in Deliverable 5.1: "User tasks and requirements; data abstractions and operations requirements". (Tasks pertaining to the work of ethnographers and how the visual dashboard supports them were already discussed in Deliverable 5.3.)

The technologies and tools used to implement and deploy the GraphRyder platform have already been discussed in detail in Deliverable 5.3. We had already underlined that the portal views and functionalities serve both the ethnographers' and users' tasks (community managers, as well as non-expert wider audience).

As previously said in Deliverable 5.3, users have adopted the GraphRyder portal; members of EdgeRyders use it with fresh harvested data on a daily basis².

Supported tasks

As far as Deliverable 5.4 is concerned, community managers form our target audience, although we also intend the dashboard to be usable by general (non-expert) users. Previous workshops³ led users to express high-level requirements (borrowed from D5.1). The requirements can be summarized in a series of high-level tasks themselves serving domain questions:

- Support the high-level task aiming at helping care professionals or activists as well as patients, and actually anyone interested in contributing to the opencare ecosystem, to make sense of collective intelligence as it takes place through online conversations.
- Navigate and explore traces of conversations helping users to make sense of the different ways in which people engage in online conversations (mailing lists, forums, social environments like twitter, or other independent platforms).

Additionally, community managers may try to:

- Observe the effect (if any) they have on the way conversations develop in the opencare community?

Data operations, interactions and views

Following the principles exposed in Deliverable 5.1, these high-level tasks had to be translated into operations conducted on data. Now, the data is basically formed of

² At the moment of writing, the edgeryders.eu portal was undergoing a major update, moving from Drupal and migrating to the more recent Discourse framework (discourse.org). As a consequence, the data used by GraphRyder is for the moment "frozen in time" and relies on annotated content that goes up to late July 2017.

³ See Deliverable 5.1 "User tasks and requirements; data abstractions and operations requirements".

content authored by users⁴.

An important step in exploiting and analyzing the data in order to support the above-mentioned tasks was to derive supplemental data informing users on:

- social interactions taking place on the portal through authorship (users replying to other users),
- thematic bridges reflecting concepts at play in conversations.

The different views that were designed all contribute to navigate, explore and question these two aspects: social and semantics.

The tag co-occurrence network view

The *tag co-occurrence view* involves all tags used by ethnographers. Two tags get connected when they co-appear in a same piece of content. This mathematical object turned out to be quite useful in revealing the dynamics of the conversations.

This view on the tag co-occurrence network serves well a first high-level task, that of

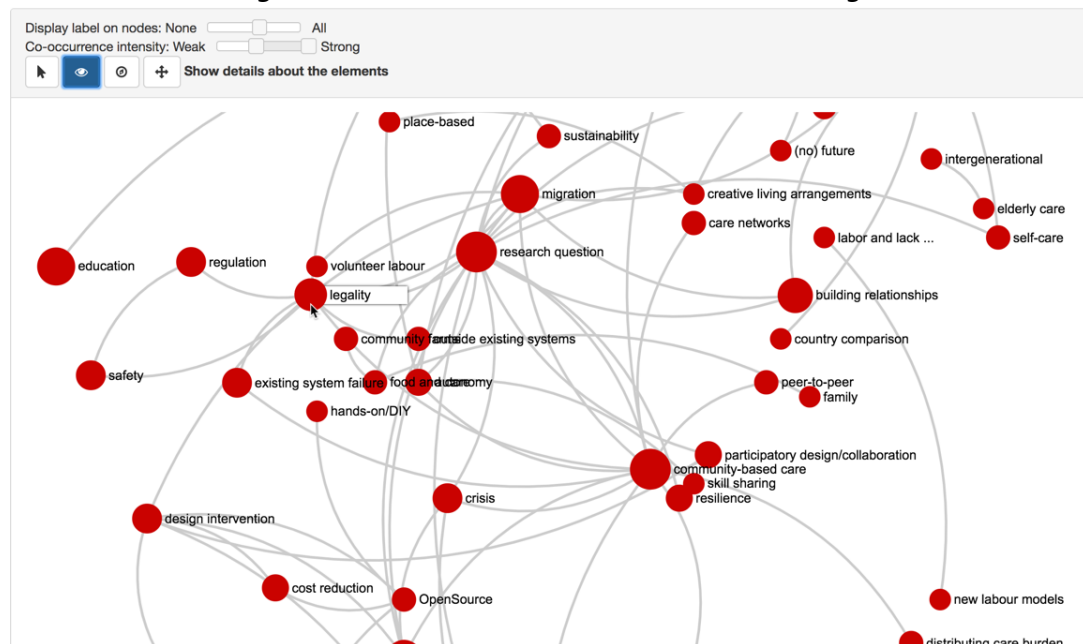


Figure 1. The tag co-occurrence view. Tags are connected when co-occurring in a same piece of content. Edges are weighted according to the number of co-occurrences in all ethno-tagged conversations.

gaining a broad insight on the conversation corpus.

While data and task characterization allows rational choices for determining suitable methods, one unique method or view does not fully fit all user

⁴ A detailed account of the data can be found as part of our Data Management Plan (see the Zenodo archive <https://zenodo.org/search?page=1&size=20&q=cottica>).

requirements. A thorough investigation of conversations requires searching meaningful angles, viewpoints and/or facts reported in conversation and potentially identifying their commonalities and differences. Moreover identifying low-frequency events or concepts in the corpus can be of interest for users searching for alternate viewpoints.

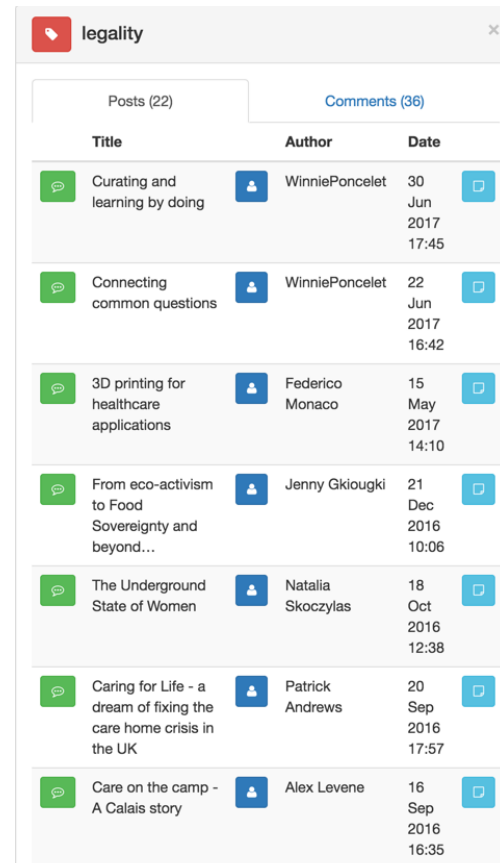
This is partly why GraphRyder combines different views on the data, with a panel of possible interactions.

These views all aim at revealing collective intelligence in action. Manipulating the views and querying their underlying data reveal insights on the ongoing collective intelligence. Interesting subsets of topics can be computed by filtering out edges with higher (redundant) or lower (seldom used) number of co-occurrences.

Higher co-occurrences values between tags (in the tag co-occurrence view) correspond to convergent ideas or perspectives. The filtering mechanism helps finding the comments and conversations. Tag popularity also maps to node size.

Content can be directly accessed (as well as information on users) through pop-up windows (see Figure 2). Clicking on a post, a pop-up window shows the original content and gives access to all other relevant elements (comments/users (authors)/tags).

The tag co-occurrence view has been used on several occasions to showcase the opencare methodology to a variety of audiences. A recently published paper develops our methodology in scaling digital ethnography, and involves using GraphRyder with the opencare data (Cottica *et al.* 2017).



legality			
Posts (22)		Comments (36)	
Title	Author	Date	
Curating and learning by doing	WinniePoncelet	30 Jun 2017 17:45	
Connecting common questions	WinniePoncelet	22 Jun 2017 16:42	
3D printing for healthcare applications	Federico Monaco	15 May 2017 14:10	
From eco-activism to Food Sovereignty and beyond...	Jenny Gkiougki	21 Dec 2016 10:06	
The Underground State of Women	Natalia Skoczylas	18 Oct 2016 12:38	
Caring for Life - a dream of fixing the care home crisis in the UK	Patrick Andrews	20 Sep 2016 17:57	
Care on the camp - A Calais story	Alex Levene	16 Sep 2016 16:35	

The social semantic network view

A complementary view builds on top of the co-occurrence network, to which a social network is added. A social network is inferred from the conversation history: users A and B are connected whenever A authors a comment to a content authored by B (see Deliverable 5.1).

The social semantic network view has been extended and now offers a 3-fold synchronized view combining:

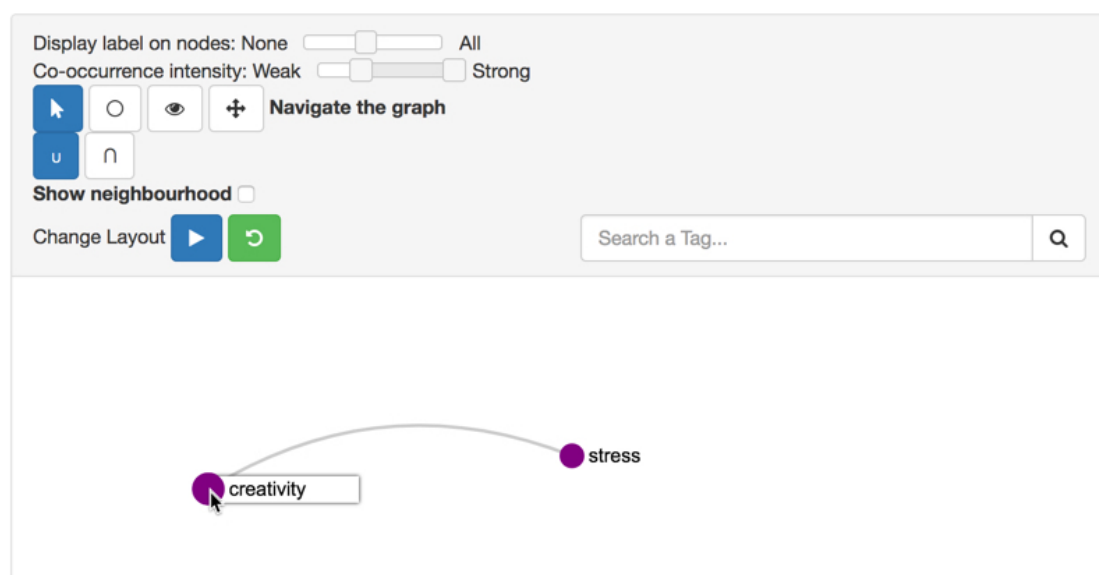
- the co-occurring tags
- the induced social network
- the conversation threads themselves

Tasks that were identified as being relevant for ethnographers still are for community managers and general users. This is the case for the tasks aiming at detecting tags engaging the most people, for instance.

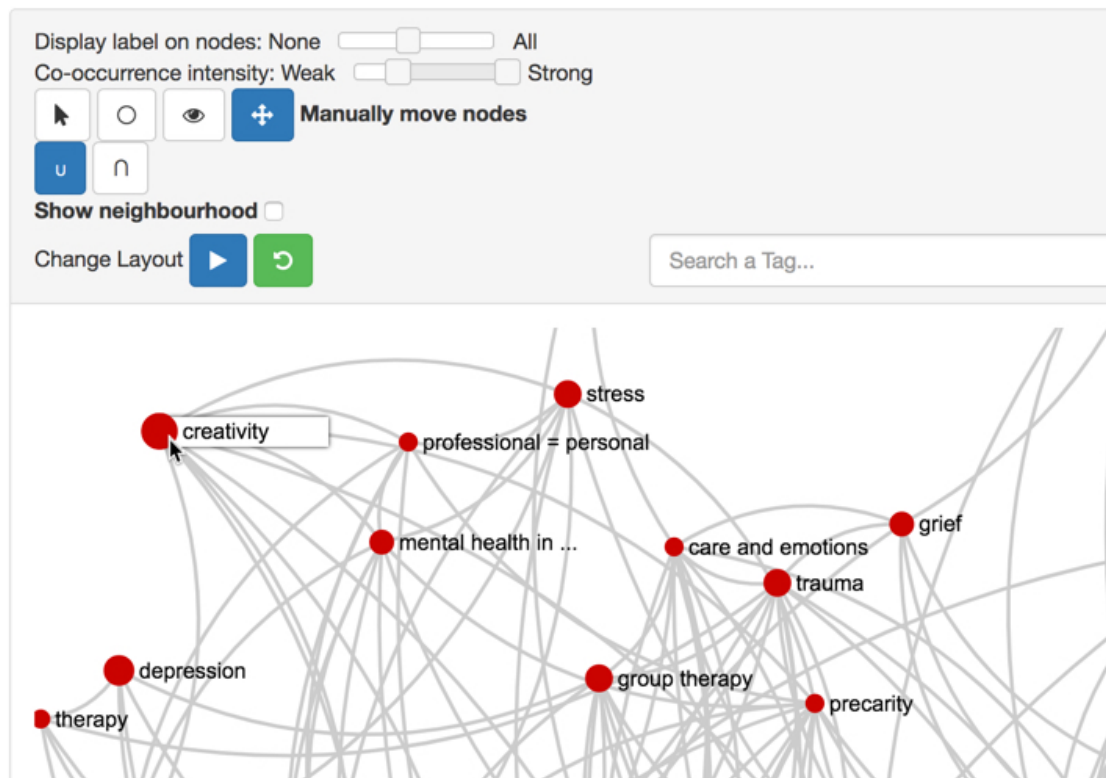
Example scenari

We use two examples to illustrate how one can use this triple-dimension synchronized view to conduct an exploratory analysis.

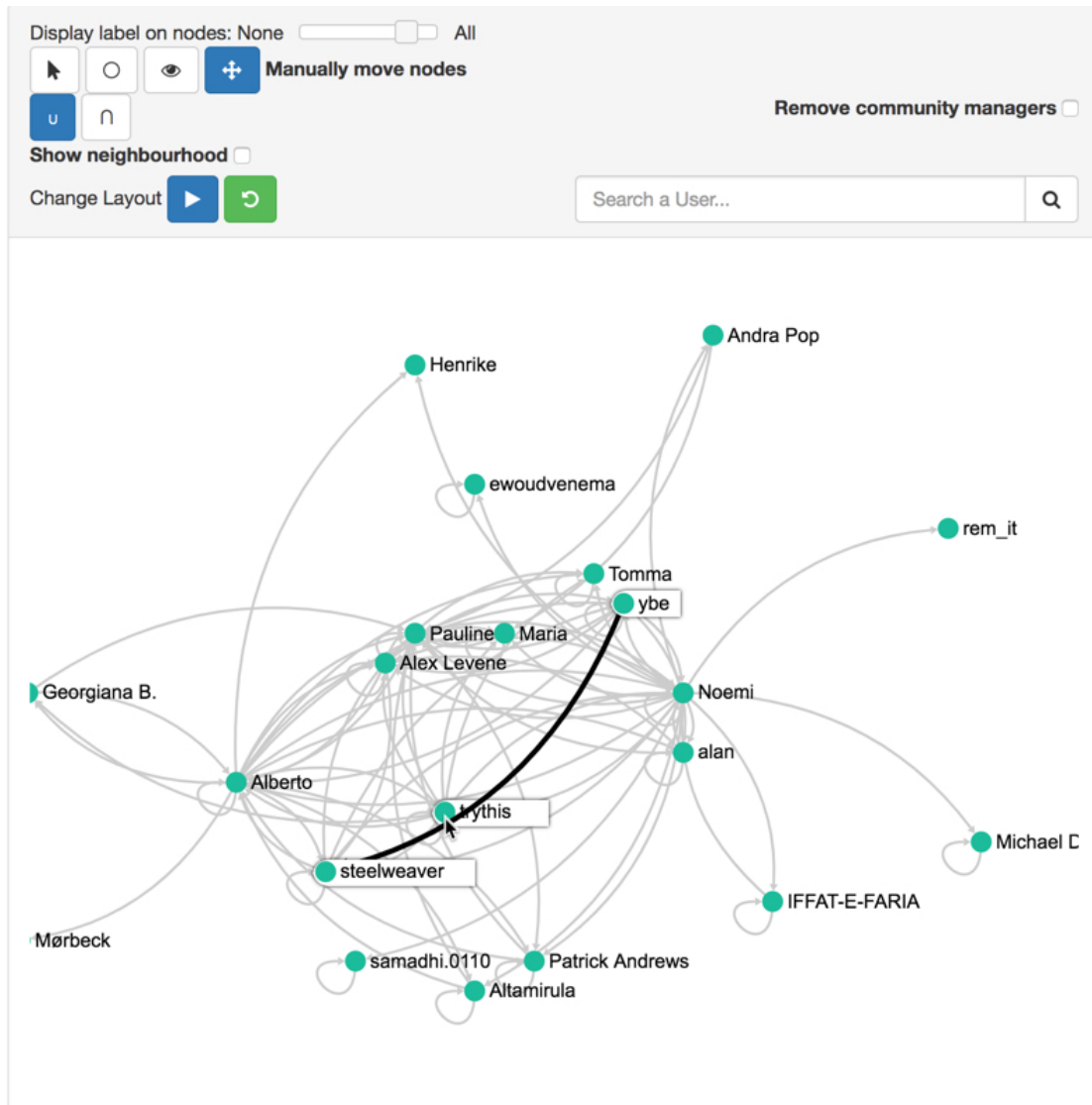
Example 1 : creativity and stress



As mentioned earlier, the tag co-occurrence view remains a good starting point to investigate the corpus. After discarding lower value edges, one may focus on an interesting and somehow surprising association between *creativity* and *stress*. Note that creativity and stress are associated with a number of other tags such as *mental health*, *trauma*, *depression* and so on, but that among all co-occurrences, creativity and stress stand as part of the higher score edges.



A look at the social network view reveals the group of people that have been involved in conversations concerned with these two concepts (tags).

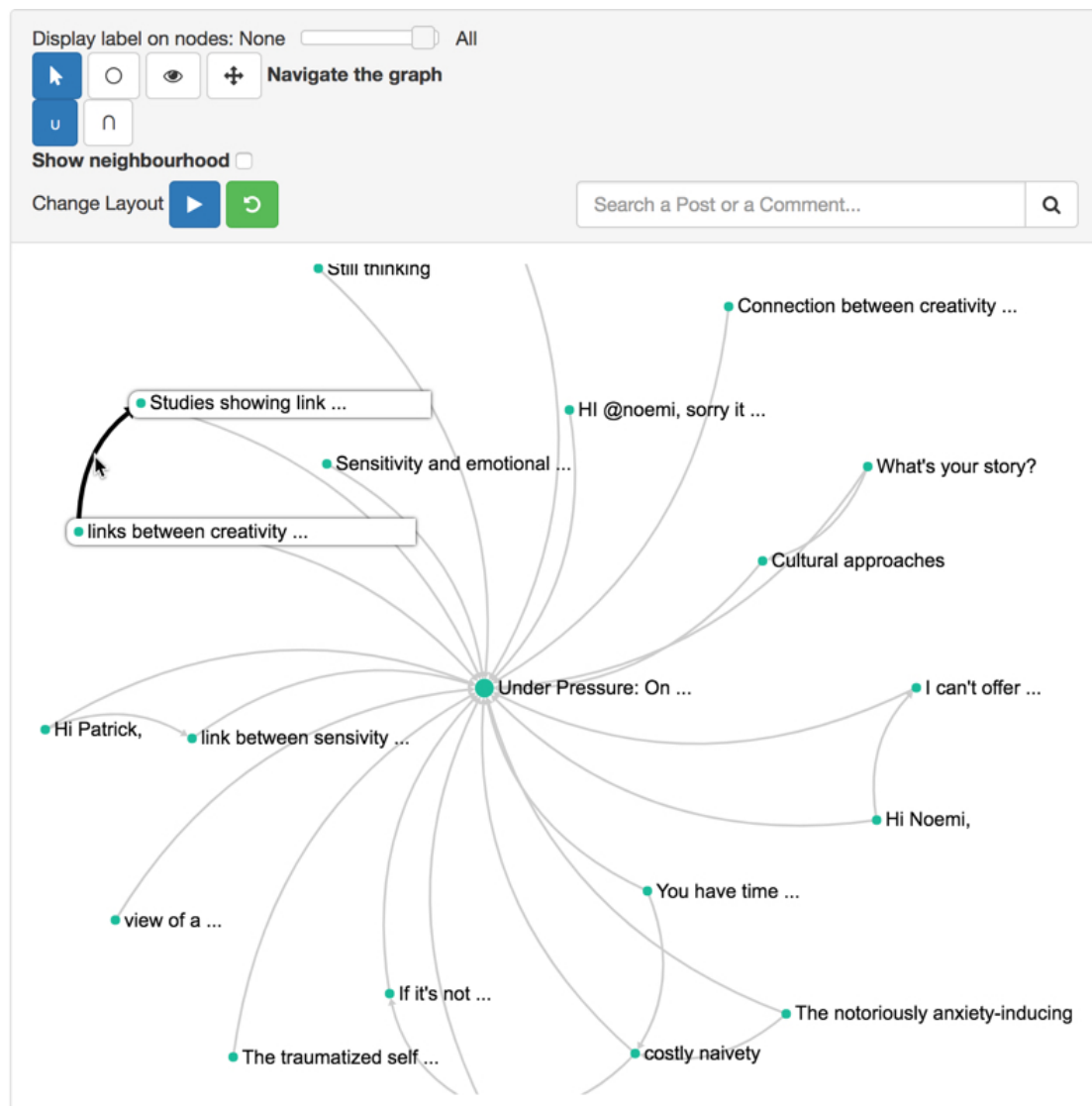


Community managers (here Alberto and Noemi) obviously played a role in bringing these actors together in the conversations. The GUI however allows to discard these community managers to observe direct interactions between users.



As the image show, community managers did not fully succeed in engaging users (such as rem-It or Mørbek) to engage with others (on these topics). Nevertheless, there is a consistent group of 10 people who have interacted regardless of the community managers action.

Lastly, the bottom view shows how the conversations evolved.

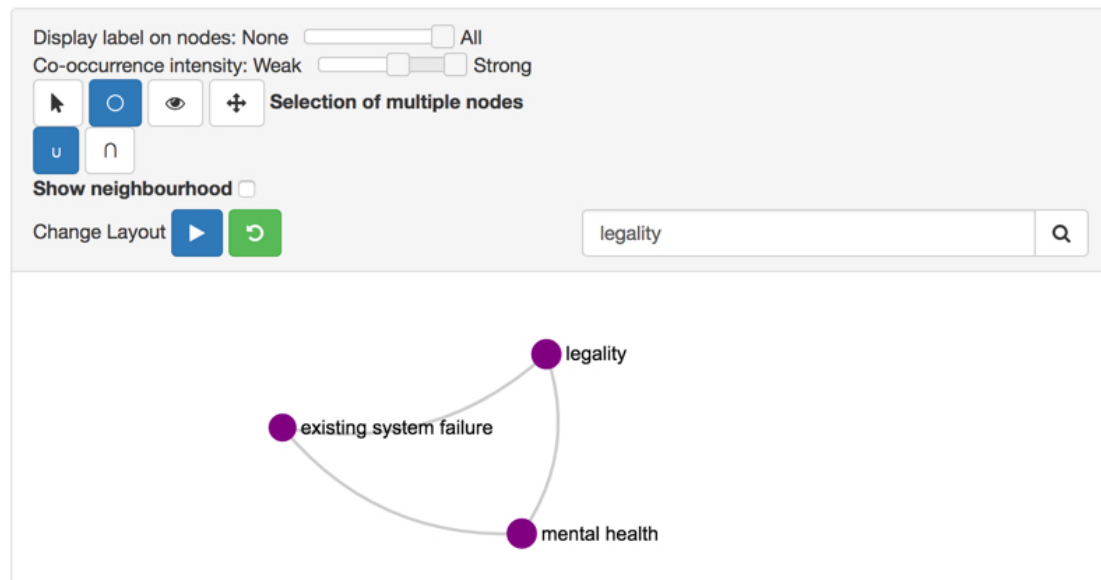


The structure of the conversation already reveals how things happened:

- An initial post triggered the whole conversation ("Under Pressure: On the relationship between creativity and emotional/mental health")
 - Most answers directly reply to the initial posts, while we see some actors replied to previous replies.

Example 2 : legality, existing system failure and mental health

The second example builds on an example emergin from the co-occurrences of three tags: *legality*, *existing system failure* and *mental health* – which may at first sight be quite surprising.

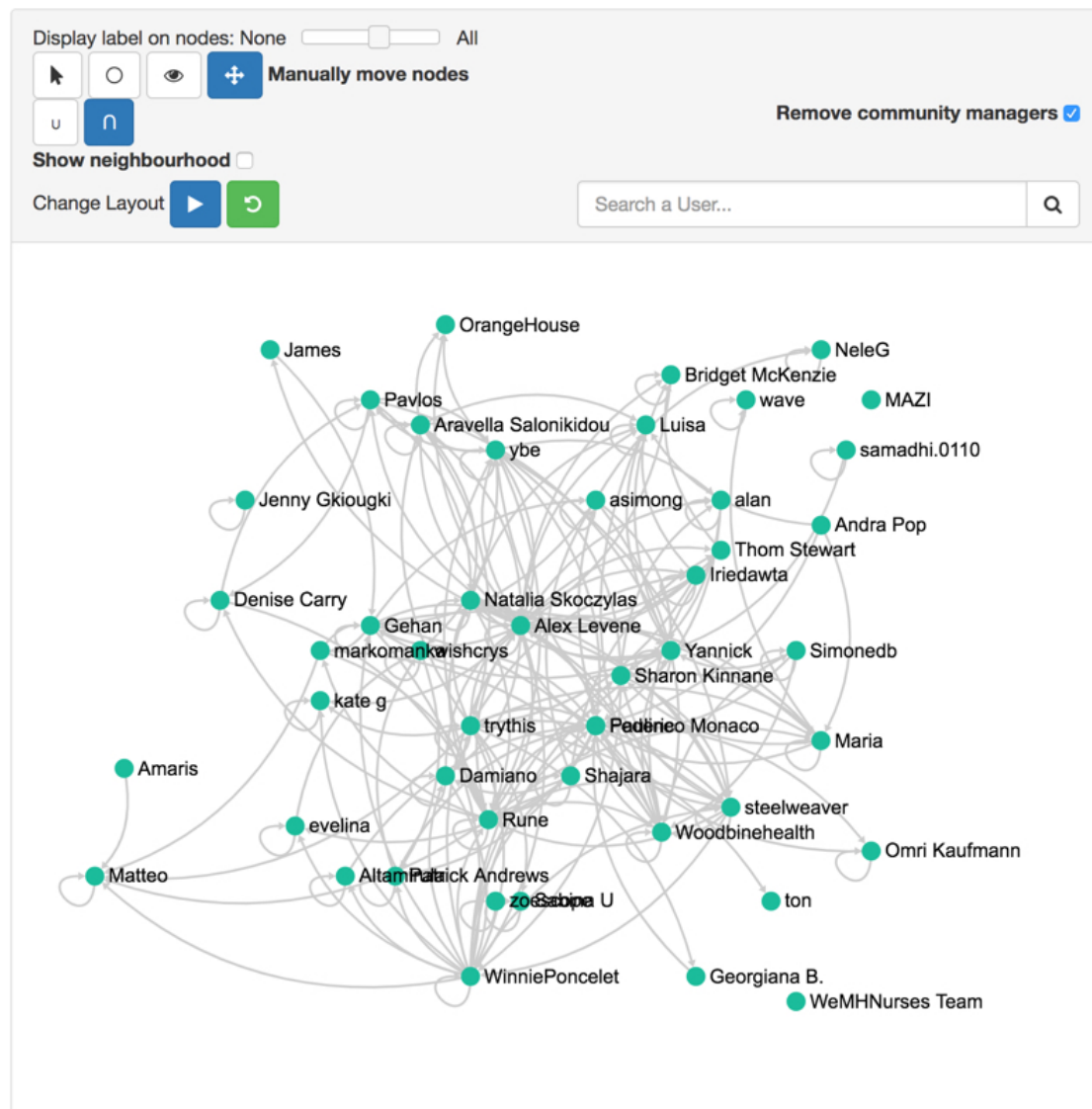


In this case, the concepts did not evolve around a single conversation initiated by a unique post, but rather expand on multiple parallel conversations (as shows the figure below). The figure indeed shows a constellation of star-shaped structures each being centered on a post branching out to replies and/or replies to replies.



Obviously, legality, system failure and mental health concern multi-faceted issues, and have been discussed in different manners or in different contexts.

Interestingly enough, the crowd of actors that got involved in these multiple conversations however forms a strongly connected community (even when discarding community managers as is the case in the figure).



These two simple examples illustrate how this threefold representation can inform users on the collective intelligence dynamics that is developing through the online conversations.



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Where innovative ideas emerge

The interface also allows to directly access content in a side (pop-up) window, to either read a post/comment or see the entire list of comments.

Under Pressure: On the relationship between creativity and emotional/mental health

16 May 2016 16:25 – Pauline

Original content on Edgeryders

Body

Comments (37)

Tags (11)

Innovations (63)

Sometimes I feel like my friends can't quite take me seriously when I tell them how much art school is stressing me. When I hear myself describe to them what we do in our courses (like dressing up and dancing around cardboard sculptures of alien Christmas trees), I sometimes find it difficult to take myself seriously. However, as most people that work in a creative field would probably tell you, it really is stressful. Being creative is intense. Apart from the financial uncertainty and competitiveness that tend to run in these professions, the work itself is very demanding, mentally and emotionally. It is very easy to become personally invested in a project, some might even call this a necessity. Because they are so closely intertwined, it is often difficult to separate between the professional and the personal. How does this affect the way we deal with issues of mental and emotional wellbeing in this context?

Under Pressure: On the relationship between creativity and emotional/mental health

16 May 2016 16:25 – Pauline

Original content on Edgeryders

Body

Comments (37)



Tags (11)

Innovations (63)












Title	Author	Date
"I hate my work" syndrome	Noemi	25 May 2017 11:33
Schizotypyl	Noemi	13 Jan 2017 11:47
links between creativity and emotional precarity	alan	12 Jan 2017 19:16
Still thinking	Alex Levene	24 Nov 2016 11:35
Don't know much	Alberto	13 Nov 2016 22:49
long tail?	steelweaver	13

Close



More interestingly, one can access the set of tags that are present in a thread, giving an overall insight on the discussion (left in the figure below).


Under Pressure: On the relationship between creativity and emotional/mental health
 16 May 2016 16:25 –  Pauline
[Original content on Edgeryders](#)























Body Comments (37) **Tags (11)** Innovations (63)

Label	Date
 mental health in creative professions	25 Nov 2016 22:47
 research question	25 Nov 2016 22:46
 creativity	25 Nov 2016 22:46
 mental health	25 Nov 2016 22:44
 research question	25 Nov 2016 22:44
 research question	25 Nov 2016 22:43
 professional = personal	25 Nov 2016 22:43
 self-doubt	25 Nov 2016 22:43
 stress	25 Nov 2016 22:41
 art and (health)care	25 Nov 2016 22:41
 stress	25 Nov 2016 22:41

Close


Under Pressure: On the relationship between creativity and emotional/mental health
 16 May 2016 16:25 –  Pauline
[Original content on Edgeryders](#)

Body Comments (37) **Tags (11)** Innovations (63)

Label	Comment
 labor and lack thereof	 "I hate my work" syndrome
 art	 "I hate my work" syndrome
 happiness	 "I hate my work" syndrome
 economies of scale	 Don't know much
 long tail markets	 Don't know much
 long tail markets	 long tail?
 economies of scale	 long tail?
 precarity	 This thread is becoming immensely resourceful.
 professional shift	 Changing professional paths
 professional shift	 Only 1 shift?!
 cognitive bias	 The notoriously anxiety-inducing profession of writing

Close

Part of these tags emerge from the initial post itself and then naturally transfer to other comments (since the issue raised by the post is discussed).

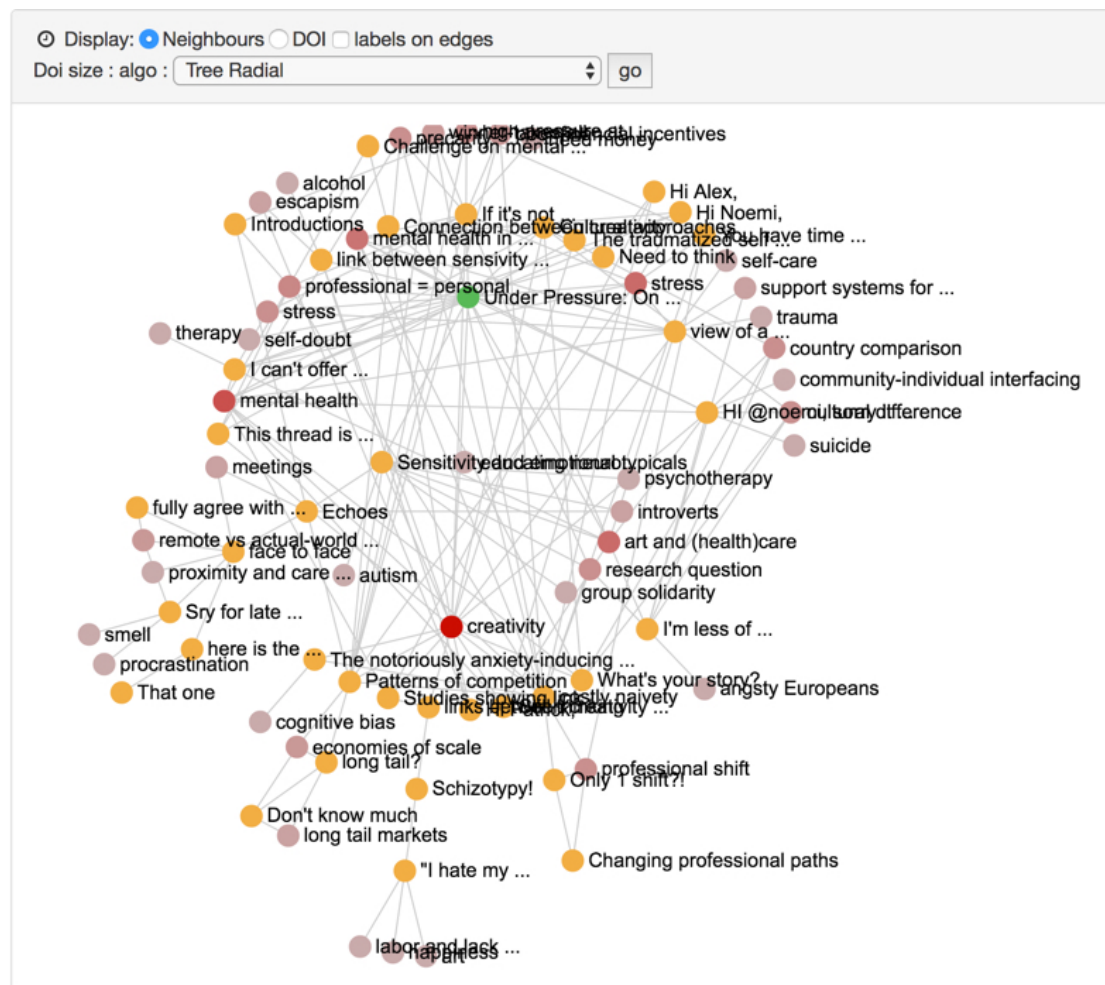
Some tags however attest the emergence of new ideas, or of a new perspective of the topic being discussed. These tags are seen as innovative and appear under the "Innovations" tab (right on the figure above), with the possibility to go to content where they appeared.

Degree of Interest view

Finally, this "innovation" view on tag can be accessed in a different manner through the "Degree of Interest" network view.

The view is built from an item entered in the search bar and centered on it. In the example below, the search was initiated with "Under Pressure ..." to recover the eco-system of comments and tags it generated.

Tags are then laid out around the initial post (green dot), with a color going from pale maroon to red according to the relative importance of tags. Unsurprisingly, we see the tags creativity and stress, and also mental health emerging in a numerous crowd of other tags. Again, a closer examination of content can be performed through pop-up windows giving direct access to posts/comments/users and tags.



The technical side of GraphRyder

As we have mentioned earlier in the introduction, we refer the reader to Deliverable 5.3 for details on the technical framework we used to build the dashboard.

Conclusion

This short document was meant to accompany the GraphRyder framework

available on [github/opencarecc](https://github.com/opencarecc).

The 3-fold synchronized view (semantic network of tags/social network of users/conversation thread space) is the more recent addition to the previously available views (tag co-occurrence and social network). Incidentally, the introduction of this 3-fold view gave us the occasion to test the claimed modularity of the GraphRyder architecture.

GraphRyder is published as an open-source application framework from which other applications can be built by assembling modules (those already realized and others from contributors).

A more comprehensive user manual documentation in the form of a walkthrough lesson will soon be made available (as part of the opencare playbook).

GraphRyder will keep being improved until the end of the project (and thereafter). Incidentally, the recently published work (Cottica et al. 2017) is developing into a more evolved analysis, involving hierarchical/overlapping clustering of the tag co-occurrence network. Although out of the scope of WP5, we may consider integrating this type of analysis to the GraphRyder dashboard – at the time of writing this companion document, this can only be mentioned as a potential improvement to GraphRyder.

References

B. Renoust and G. Melançon and T. Munzner (2015). "Detangler: Visual Analytics for Multiplex Networks", Computer Graphics Forum, Volume 34 (2015), Number 3.

Cottica A., J.Vallet, A. Hassoun and G. Melançon (2017). Semantic social networks: a new approach to scaling digital ethnography. 4th International Conference on Internet Science 22-24 November, 2017, Thessaloniki, Greece (see internetscienceconference.eu) – proceedings to be published in a Springer LNCS book.