Deliverable D8.4
Training Activities Report

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Abstract: In this deliverable, we report all the training activities within the project duration. The activities include the summer school, workshops and hand-on sessions with different target groups, such as students and researchers interested in the research and technologies advanced by REVEAL, professionals in the field of journalism, companies that extensively use enterprise community networks, etc. The goal was to train the relevant stakeholders in using the REVEAL platform and understanding how hidden modalities are extracted.

Keyword List: Training activities, summer school, user manual, REVEAL applications
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<th>Title</th>
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<tbody>
<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>ESSIR</td>
<td>European Summer School in Information Retrieval</td>
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<tr>
<td>FDIA</td>
<td>Future Directions in Information Access</td>
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<td>IRML</td>
<td>International Research-centred Summer School</td>
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<td>UGC</td>
<td>User Generated Content</td>
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<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
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Executive Summary

Deliverable D8.4 reports on the training activities within the project duration. The activities include the summer school, workshops and hand-on sessions with different target groups, such as:

- students and researchers interested in the research and technologies advanced by REVEAL,
- professionals in the field of journalism,
- companies that extensively use enterprise community networks, etc.

The goal was to train the relevant stakeholders in using the REVEAL platform and understanding how hidden modalities are extracted. By this, we achieved building confidence and knowledge in the use of REVEAL tools, both from the perspective of the partners, content providers and most importantly the system users.

The training activities have provided not only an effective learning environment tailored to the specific user needs, but also served as a first level validation tool for measuring the effectiveness of the REVEAL services offered. Moreover, together with the dissemination activities they promoted further the project results.
1 Introduction

The changes brought by new web social media technologies mainly refer to the appearance of new types of content providers and new types of content, often referred to as ‘new media’. New media is giving the power of speech to the citizens who can now very easily report, blog and send short text messages (e.g., tweets), and rapidly create new content in huge amounts. Traditionally, in the area of news media, conventional journalism has been the main trend, operating with standard news collection and broadcasting procedures while mediating mainstream types of content (e.g., politics, sport, economy, culture, health) from authoritative sources. However, in the last few years, new Internet web technologies have appeared and have disrupted this business process. Traditional news media are getting more and more overcome by the rise of web news services.

The evolution of the Internet is associated to an increasing level of “social involvement” of the users. Social Media (social networking platforms, blogs, etc.) clearly demonstrate the Internet utilization with the highest user involvement. Due to this increasing level of user involvement, social media have become a valuable tool to share information. They offer the opportunity to generate, collect and communicate new knowledge and information in diverse aspects of human life.

Mining the complex signals from social media sensors to understand and describe real world events and social trends requires the development and combination of sophisticated analysis techniques. The content spontaneously generated by the crowd contains rich and near-real-time information about events happening all over the world, but the amount of data available and the vastness of the user base requires a big effort on information filtering and organization to drill down to relevant topics and information generators.

Moreover, as social media tools get more sophisticated, and content is being created in massive amounts, there is a need to effectively rate its quality and validity. This entails the analysis of information flows in real or near-real time and the estimation of attributes of users (e.g. trustworthiness, confidentiality), items and metadata (e.g. relevance), as well as the examination of implicit relations among users, content and metadata.

REVEAL, aimed to discover higher level concepts hidden within information. A core challenge is to decipher interactions of individuals in permanently changing constellations, and do so in real time. The analysis of social media in REVEAL focused on structural and contextual aspects. Structural aspects pertain to the analysis of links between content contributors and the content itself, and the communities formed. Community detection research can help reveal the structure of the social media network, common interest groups, as well as the most influential users and the most critical discussion topics. It can also be used for modelling the dissemination speed of news in social media, or providing content recommendations to users.

Content analysis entails multimedia indexing, computational stylometry, similarity analysis and general study of relations between content items, and content credibility evaluation. Advanced multimedia indexing is necessary for the detection of named entities and concepts, which is a prerequisite for the more ambitious goal of detecting similarities between media content items. Computational stylometry can help reveal content provenance by finding similarities in writing styles. Similarity analysis is also related to plagiarism, which is linked to credibility evaluation.

Context-centric interpretation involves event recognition, location analysis of media, and social context analysis. Event recognition refers to the identification of simple and composite events that satisfy some pattern (e.g. the identifications of an emergency situation, of a protest or demonstration). Machine learning techniques are commonly used for this task, as well as methods for reducing the uncertainty in the identification process. Location analysis leverages on geotagged media as well as volunteered geographic information and can help assess the proximity of
information to events and credibility of information (consider, for example, the case of a newscaster reporting immediately from an event location). Social interactions around content (e.g., comments) carry a rich information context, which, if appropriately analysed, can yield deep insights into the impact that media content has on users, and reveal popularity, and reputation modalities.

To this end, the core of the work in REVEAL was to reveal hidden modalities for the benefit of a better understanding and utilization of the Social Media world.

Throughout the whole project duration, the consortium has also aimed to undertake all the necessary training activities to make REVEAL and its services easily understood and adopted from professional (as service providers) and public users. In this deliverable we describe the training activities, the targeted groups of trainees, and the material used tailored to the specific trainees’ needs.

The structure of this deliverable is as follows: Section 2 reports on the major training activities undertaken in the project’s lifetime. Among them, the Summer School, in which the participants were trained in the use of the REVEAL tools for discovering information and the associated hidden concepts in Social Media, and for using these tools to improve their own community networks. Section 3 describes the user manuals prepared for both the News and the Enterprise applications, intended to give assistance to all potential user groups using the REVEAL platform. Finally, in the conclusion (Section 4), we summarize the work in this report.
2 Training activities

2.1 International Research-centred Summer School

Date: 3 July – 30 July 2014

Place: Athens, Greece

Description: The Summer School (http://irss.iit.demokritos.gr/) was organized by the Software & Knowledge Engineering Lab at the Institute of Informatics & Telecommunications of NCSR ‘Demokritos’ (http://www.iit.demokritos.gr/skel), ATC (http://www.atc.gr) and IRML (http://www.irmllab.com). The Summer School had an innovative format: it was Research-Centred, with a strong focus on mini-projects of month-long duration, carried out by multiple teams of 3-4 students including a mix of academic levels (Postdoc, PhD, undergraduates). Selected seminars and lectures also took place (not exceeding two hours per day http://irss.iit.demokritos.gr/calendar/month/2014-7) and there were many invited speakers with different background (http://irss.iit.demokritos.gr/2014/syllabus/invited_speakers). Exciting cultural events and excursions took place during the weekends. The outcome of the summer school included both numerous scientific publications, as well as longer-term collaborations. During the event, groups of undergraduate and postgraduate students were trained to technologies relevant to the objectives of the REVEAL project. In particular, issues related to contributors in social networks as well as to content were investigated by small groups of students under the supervision of NCSR ‘Demokritos’ researchers and participants to the REVEAL project.

Trainees: About 30 undergraduate, postgraduate and PhD students attended the Summer School.

Material: Presentations, demos, hands-out of project material and hands-on sessions.

Figure 1: IRSS 2014 Summer school

2.2 10th European Summer School on Information Retrieval

Date: 31 July – 4 September 2015

Place: Thessaloniki, Greece

Description: The 10th European Summer School in Information Retrieval (ESSIR 2015) was held in Thessaloniki, Greece hosted by the Multimedia Knowledge and Social Media Analytics Laboratory

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Project Coordinator: INTRASOFT International S.A.

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ESSIR 2015 (http://mklab.iti.gr/essir2015/) was a 5-day event (31 August – 4 September, 2015) that aimed to offer a high quality teaching on IR and related research topics, in a friendly atmosphere. A new edition of the Symposium on Future Directions in Information Access (FDIA) was also held at ESSIR 2015, which provided a forum for early researchers to present their research in a friendly environment, whilst among senior researchers.

Several training activities of high relevance to REVEAL took place including: (i) a lecture focusing on "social media mining and retrieval" given by leading scientist Dr. Carlos Castillo, and (ii) two interactive group activities with key themes as to the verification and personal data disclosure in a connected world. In the context of the first activity, students were asked to manually label tweets from the image verification corpus (developed by REVEAL) as being accurate or misleading, and then discussed their findings and presented the key outcomes. More details on the group activities may be found at http://mklab.iti.gr/essir2015/?page_id=885.

Trainees: 52 PhD students primarily from European universities.

Material: Presentations, demos, hand-out of project material and hands-on sessions. The lectures can be found under this link: http://mklab.iti.gr/essir2015/?page_id=22.

2.3 DW Basic Verification Trainings

Date: 2015 - 2016

Place: Deutsche Welle offices in Bonn and Berlin

Description: Over 2015 and 2016 DW has carried out 14 Basic Verification Trainings at DW in which they have trained over 80 journalists in basic verification skills.

Social Media Networks are more important sources for news than ever. But how do you know what information found on e.g. Twitter and Facebook is real and can be used for journalistic purposes? By finding out clues and facts with a diverse array of tools you can check if the information that you have found is trustworthy and you can then place the information into context (e.g. is this an original image from Syria taken in 2015?). This basic training in Social Media verification focuses on verification of source, time & date and location.

What you will take away:

- Why Social Media verification is not different from your normal journalistic work
- Why & how to verify Social Media content (text, image, video)
Introduction to the most important open source software tools (Google reverse image search, Pipi, Who.is and more)

- You can practice what you have just learned in an exercise session: verification of source, time & date and location
- How to get and agree on permission to use the Social Media content for DW (copyright, crediting and more)
- You will receive a checklist and verification guidelines (http://revealproject.eu/a-roadmap-to-the-truth/) to take home

**Language:** Deutsch / English

**Duration:** 1 Day

**Attendees:** max 8 pers.

**Trainers:** Julia Bayer (https://twitter.com/bayer_julia) and Ruben Bouwmeester (https://twitter.com/RubyBouw)

**Trainees:** All the Deutsche Welle journalists that we have trained by now are part of the Deutsche Welle verification network in which they collaborate and share knowledge/expertise in order to work more efficient.

**Material:** Part of the materials used are described in this article http://revealproject.eu/a-roadmap-to-the-truth/ on the REVEAL website.

The checklist and workflows that have been developed for this training are also shared with the EBU verification network and updated with best practices of other broadcasters and First Draft News.

![Figure 3: Verification of eyewitness media](image-url)
**DW Verification Checklist**

<table>
<thead>
<tr>
<th>Event:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Editor(s):</td>
<td>Date last modified:</td>
</tr>
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**Verification Status:** Pending, Verified, Unconfirmed, False, Profanity, Graphic (highlight status)

**Permission:** Yes / No (highlight status)

**Content:**

<table>
<thead>
<tr>
<th>Screenshot</th>
<th>Insert here or link to location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link to content (URL)</td>
<td></td>
</tr>
</tbody>
</table>

**Claim (What is the content claiming to show?)**

**Language (written & heard):**

**Publication timestamp**

(Off content item under investigation)

| Date: |
| Time: |

**Similar images & publication dates**

**Location information**

(Off content item under investigation)

| Country: |
| City: |
| Street: |
| Coordinates: |

**Landmarks / reference points**

**EXIF data**

(Device, timestamp, copyright, credit, etc.)

**Red flags & verification notes**

(please timestamp your notes)

**Source:**

<table>
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<th>Twitter:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Plus when did user start on Social Network)</td>
<td>Facebook:</td>
</tr>
<tr>
<td></td>
<td>LinkedIn:</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
</tbody>
</table>

**Real Name**

**Safety & security**

Wishes to stay anonymous / do not contact source / other ...

**Crediting**

Does not want to be credited / credit with real name / credit with ...

**Permission content (as agreed with source)**

No permission / use online only / use TV only / use online & TV

**Permission user data (for future use, as agreed with source)**

Allowed to store user data / not allowed to store user data

**Country of origin & language communication**

**Email**

**Phone number**

**Address**

**Other contact info (eMail, direct message, employer, etc.)**

**Context (history, bias & sentiment of social media contributions)**

**Red flags & verification notes**

(please timestamp your notes) (Add external communication here, emails and such)

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DW ©2016 - Authors: Julia Bayer (Social Media News / DW Innovation) & Ruben Bouwmeester (DW Innovation)

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Project Coordinator: INTRASOFT International S.A.

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2.4 WSTNet Web Science Summer School 2016

Date: 30 June – 6 July 2016

Place: Koblenz, Germany

Description: The summer school (http://wwsss16.west.uni-koblenz.de/) covered six web science aspects, one per day. The mix of keynotes, tutorials and supervised project work around various topics of Web Science provided an effective and motivating learning experience. More specifically:

- Introduction to Web Science explained Web Science as a discipline and taught both methods and scope of web science. It made students understand that the web is a complex system where technical and social aspects interact.
- Computational Social Science demonstrated how methods of computer science can be applied to the social sciences to understand social phenomena with data from the web.
- Social Machines investigated how the creative actions of people can be organised by computers in a way that complex tasks (which require cognition, intelligence or creativity) are organised in large scale (e.g. in Crowd Computing).
- Web and Politics covered the interrelation of citizens and government over the web as well as political processes that take place in the web.
- Web Entrepreneurship taught how the Web can successfully be used to build a start-up, be as a service or to distribute new or existing products. Students were able to develop and improve their own ideas and to evaluate existing concepts.
- Internet and Law focused on the Web as a system that expands over different countries with different legal regulations. Issues such as business law, media law, copyright law and information security were covered during the summer school.

Among the above topics of high relevance to REVEAL, several activities closely related to REVEAL were undertaken:

- The tutorials “Introduction to Web Science” and “Web Science in Practice: Web Observatories” were given by REVEAL researchers Steffen Staab and Jérôme Kunegis, and were in the scope of REVEAL project.
- In supervised project works “Hate speech in the Social Web”, “Spamming with Data” and “Panama Papers”, groups of students under the supervision of REVEAL researchers investigated the topics which were of high relevance of REVEAL, and used the technologies developed in REVEAL.

Trainees: About 40 bachelor students, master students, PhD students and Post-Docs participated, who were interested in the World Wide Web as a socio-technical system.

Material: tutorials, keynotes presentations, demos, hands-out of project material and hands-on sessions. For more information on the programme, please visit http://wwsss16.west.uni-koblenz.de/schedule.
2.5 REVEAL Workshop

**Date:** 20 September 2016  
**Place:** Athens, Greece

**Description:** On 20 Sep 2016 we conducted the final REVEAL workshop. Almost 90 participants attended and joined in lively discussions about challenges and approaches regarding the use and verification of social media in news. Presentations were supplemented by hands-on sessions of prototypes, demos and the like.

The workshop consisted of:

- A round table with participants from all projects and the keynote speakers.
- Hands-on demos of tools and services developed in REVEAL, InVID and PHEME
- Networking sessions and information exchanges

**Trainees:**

a) People interested in verification of UGC  
b) Journalists / people working in media  
c) Scientists working in social media analysis and verification

About 90 people attended the workshop. It was very well received.

**Material:** Presentations, demos, access to prototypes, hand-out of project material and hands-on sessions. For more information and a detailed report about the workshop please see [http://revealproject.eu/reveal-workshop-review-resources/](http://revealproject.eu/reveal-workshop-review-resources/)
Figure 5: REVEAL workshop
3 User manuals

3.1 REVEAL News application

The REVEAL News application is available at the following URL: http://reveals.atc.gr/reveal-ui/bs/index.html

The credentials available at this time are:

- **User name**: atc
- **Password**: reveal123

The tools are developed under the research project REVEAL (http://revealproject.eu), supported by the European framework programme for research.

3.1.1 Social media stream monitor

Getting an overview of social media content is challenging. To help journalists monitor social media content, we suggest a solution where you can easily define and update your own streams based on search terms and choice of social media service (Twitter and Facebook posts currently implemented). Content that you want to save for later use is easily stored in collections.

![Image of stream monitor view]

Figure 6: Stream monitor view

When a new stream is defined, a new column is created and populated immediately (if Twitter is the source) with content coming from the Twitter search API. A new crawl (assessment) is initiated using the Twitter streaming API which will start to gather content that will be displayed each time the column content is refreshed (by scrolling upwards).

At the top right of the stream column, users can:

- delete the stream

Here, a user can find collections of stories a journalist keeps for further investigation. Stream content below can be added to these collections by dragging and dropping the content to the collections.
• get redirected to the multimedia view related to the stream by clicking on the image icon (see section 2)
• get redirected to the stream analysis results by clicking on the magnifier icon (see section 3)
• filter content in that stream by clicking on the filter icon
• receive some general information on the stream by clicking on the information icon

3.1.2 Multimedia content overview

The multimedia content overview allows the user to:

• browse through the collected multimedia associated to that stream (see section 2.1),
• view the entities that have been recognized (see section 2.2) and
• detect any manipulation and misuse of web multimedia content (see section 2.3).

3.1.2.1 Browse multimedia content

Even when social media content is sorted in streams (as on the previous page), it may be challenging to identify relevant content. For this purpose, we suggest a view highlighting the multimedia content provided in a stream. This way, it will be easy to overview the content, and to identify relevant imagery or videos.
3.1.2.2 View entities

To further make it easy to navigate the social media content of a particular topic stream, we have set up a view where the content is grouped according to salient characteristics – such as location, person, and organization. You can then, for example, access relevant content for a particular location or person.

3.1.2.3 Verify multimedia content

The image verification results aims to assist media professionals in the process of detecting multimedia manipulations. Examples of manipulation include maliciously tampering with images and videos, e.g., splicing, removal/addition of elements, while other kinds of misuse include the reposting of previously captured multimedia content in a different context (e.g., a new event) claiming that it was captured there. Furthermore, the multimedia manipulation module integrated in the news application, incorporates a web-based user-friendly interface to make results available to media professionals.
3.1.3 Social media stream analysis

The user can browse more information regarding the stream he/she has selected, as shown in the sections below:

- **Top users**: see the list of top users and information related to them, based on influence level, number of posts and number of followers (see section 3.1.3.1).
- **Interactive map**: provide an interactive map, relating posts with locations (see section 3.1.3.2).
- **Interactive timeline**: provide an interactive timeline, relating posts with time (horizontal axis) and topics (vertical axis) and level of mentions (indicated by colour) (see section 3.1.3.3).
- **Active communities**: show the communities related to that stream and display more information by clicking on a user of the community (see section 3.1.3.4).
- **Influence**: display information about who posted most about topics related to the stream, filtering with the influence level of the users (see section 3.1.3.5).
- **Popularity prediction**: provide some information related to the stream selected, such as the number of users that have posted in the stream, number of comments, etc. (see section 3.1.3.6).
- **Community evolution prediction**: predict if the community is evolving, dissolving, or continuing the same (see section 3.1.3.7).
- **Semantic search**: offer to the user an advanced search option, which will return the more semantically similar tweets, rather than the ones that contain only the same keywords, as in the case of a simple search function (see section 3.1.3.8).
- **Sentiment detector**: analyse the sentiment of the posts contained in the stream (see section 3.1.3.9).

3.1.3.1 Top users

The “top users” page aims to identify the most influential users in the stream selected for analysis. The journalist can sort them by the influence score, number of followers or number of tweets. Clicking then on the specific user, the journalist can get more information regarding the topics this user is influential and his/her relevant posts.
3.1.3.2 Interactive map

The map view is intended to display geospatial clusters at different levels of granularity. At the highest level of granularity content items are clustered by geographic region. When zooming in clusters for individual roads/rivers/etc. can be seen and lastly individual buildings/parks/etc. A set of filters (e.g. content type, time range, classifier results) and cluster settings (e.g. admin level for region clusters) are available to interactively change the view and help users explore the data available. The regions are colour coded based on mention count (i.e. brighter the colour the more mentions are in that region).

Each location (e.g. a city) can be interactively selected and the top N posts for that location viewed in a details layer. The details layer renders posts as they would be in Twitter etc. ordered by created timestamp so the earliest mentions appear first. For verification this is helpful since end users may want the earliest mentions to help with tracking down the original post of a media item (linked or embedded) and the author of this original post.

A secondary cluster metric (e.g. URI, hashtag, damage report) can be specified and the top N metric values shown for all posts that contain a mention of the selected location. This is displayed in an exploding thumbnail type layer and allows users to see the top N trending metrics (e.g. URI) for a given location. Each thumbnail can itself be selected and the posts mentioning its value will be displayed in the details layer.
3.1.3.3 Interactive timeline

The temporal view is intended to display a Gantt style view showing sampled sets of posts over a time window. A sample size can be chosen (e.g. 5 minutes, 1 hour or 1 day) and sample time is plotted on the x-axis of the view. A primary cluster metric (e.g. URI, hashtag, location, damage report) can be selected and this is plotted on the y-axis. A set of filters (e.g. content type, time range, classifier results) are available to interactively change the view and help users explore the data available. The sample cells are colour coded based on mention count (i.e. brighter the colour the more mentions are in that sample cell).

Each cell on the Gantt chart can be selected and represents all the posts in that time sample that have the value of the chosen primary cluster metric (e.g. with a specific hashtag value). The details layer renders the top N selected posts as they would be in Twitter etc. ordered by created timestamp so the earliest mentions appear first.

A secondary cluster metric (e.g. URI, hashtag, location, damage report) can be specified and the top N secondary metric values will be shown for all posts that contain a mention of the primary metric value and have a timestamp that falls within the selected sample cell. This is displayed in an exploding thumbnail type layer and allows users to see the top N trending metrics (e.g. URI) for a given temporal sample. Each thumbnail can itself be selected and the selected cluster posts mentioning its value displayed in the details layer.
3.1.3.4 Active communities

This page aims at showing the active communities related to that stream as they evolve over time. The end user can select to have a view of the communities as blobs based on the number of users, level of centrality or number of connections. Clicking on a community, more information is displayed with a graph of users and their connections. Clicking on a specific user you can get more related information.
3.1.3.5 Influence

Using information regarding the influence of the users, the topic of the content of their tweets and the structural elements of a graph, that models users as nodes and edges between those nodes as interactions of the users such as likes, retweets, mentions etc., we can create a network representation enabling multiple-aspect browsing of the data.

Each node has a radius proportional to its influence, color according to their main topic of interest. So the end user can search for influential users, the interactions between them or filter them with regard to the topic of interest.
3.1.3.6 Popularity prediction

Using information regarding the influence of the users, the topic of the content of their tweets and the structural elements of a graph, that models users as nodes and edges between those nodes as interactions of the users such as likes, retweets, mentions etc., we can create a network representation enabling multiple-aspect browsing of the data.

Each node has a radius proportional to its influence, color according to their main topic of interest. So the end user can search for influential users, the interactions between them or filter them with regard to the topic of interest.

![Figure 16: Popularity prediction page](image)

3.1.3.7 Community evolution prediction

Communities that are formed in online dynamic social networks as a result of user interaction are not static, but they evolve in time. Inherently, as time passes, social networks change; users dynamically join and leave affecting the characteristics defining the network. On a community scale, this dynamic behavior through time translates to certain evolutionary events, i.e. the creation of new communities, the death of others and so on. This behavior and the underlying factors that drive it are a subject of great interest and many researchers have contributed to the understanding of these phenomena. In this context, we detect communities in Twitter, label their evolutionary behavior to obtain a groundtruth and attempt to identify those features that contribute the most in automatically predicting the evolutionary behavior of communities.
3.1.3.8 Semantic search

When it comes to locating newsworthy events on social networks, journalists are faced with the mundane challenge of skimming through a vast amount of irrelevant information in their quest to attain the sparsely interspersed nuggets of extremely valuable information they seek. A journalist interested in a document about some event is likely to need an easy way of retrieving relevant documents. Some automated method is needed which can assist journalists by providing them with concise explorable information. It therefore makes sense to leverage information produced by relation extraction and named entity recognition methods in order to group together relevant documents and provide an easier way of navigating and making sense of them.

Semantic search page allows end users to search for relations, view similar ones as well as perform relation extraction of a text of their liking. There are currently three operations that can be performed. The first one is to view the relations our system extracts when given a sentence. The result is a list of 3-tuples - the relations extracted with labels which reveal named entity information if any entities were found. The second operation handles querying the relations for certain actions. If any similar actions are found, the groups of the corresponding documents are returned alongside with a count for the number of found documents. The groups can then be expanded by clicking on them to see documents that were found in each group. As in the previous case, relations are presented as 3-tuples with labels which show named entity information if any entities were found.

You can e.g., type in the Nobel prize stream the following sentence: “Putin is awarded by Venezuela” and get results.

The module recognizes the involved entities and their type (in this case ‘Putin’ as a Person, and ‘Venezuela’ as a location). The user has the possibility to filter the results, based on the entities involved. For example, he/she can choose to see only the related tweets which contain persons as subject of the relation, or only locations as the argument of the relations. He/she can even filter the results based on a particular entity and not just its type (e.g. “Venezuela”). In other words, the user can see the results with the same or semantically similar subject or argument respectively.
3.1.3.9 Sentiment detector

If the end user is interested to get the general feeling about the sentiment on the specific stream, he/she can view the sentiment pie which analyses the sentiment of the posts contained in the stream.

3.1.4 Collection Board
The journalist would like to keep some pieces of content that he/she might find interesting from the streams. Thus, we have provided this collection board, in which each collection is a container of content manually added from the stream monitor view. Users can create new collections or delete existing ones. They can sort it by various criteria and also select an item and, by clicking on the ‘verification status’, go to the Verification Board.

![Collection board view](image)

**Figure 20: Collection board view**

### 3.1.5 Verification Board

The social media verification features are assembled in what we call a verification board. The Verification Board is called when users want to verify a specific Social Media item. Here the journalists are provided with:

- **The Content**: containing basic information about the post
- **Verification checklist**: a section that contains manually editable annotation fields. Automatically computed information can be manually added to this section from the third section (“What Reveal found out” as shown in the figure below).
- **What Reveal found for you**:
  - **TruthNest**: Information received by the API of the ATC TruthNest application\(^1\), which provides verification information at individual tweet level (see section 5.1).

\(^1\) Information about the TruthNest application is available under [http://www.truthnest.com/](http://www.truthnest.com/)
- **Fake post detector**: Information regarding the veracity of the tweets that have been computed in relation to content and contributor features of historic cases of fake and real tweets (see section 5.2).
- **Similar posts**: a view of similar posts related to that item (please note that currently no results are displayed, since at this time, this is under integration work).
- **User information**: basic user information, such as: twitter name, creation date, language, likely gender and likely age. For the last two information these are derived through the approach of stylometry, namely, recognition of the style and patterns of the way somebody writes.
3.1.5.1 TruthNest

TruthNest\(^2\) verifies information applying the so called ‘**triple-C method**’, a method that is tackling, with a multidimensional approach, the assessment of the trustworthiness of a post by applying metrics under the following pillars:

- **Contributor** – This involves all data relevant to the source of information, such as its history, its reputation, its connections and interactions in the social circle and any other information that can assist in the profiling of any contributor of content.
- **Content** – This includes analysis methods that can provide clues about the credibility of linked content (as photos and linked web content) and indicate possible manipulations and fraudulent use.
- **Context** – Under this pillar we investigate all contextual relations which strengthen or weaken the confidence built around several concepts

More specific, we apply a set of metrics for each individual pillar in order to collect and finally assess all relevant information/data for concluding to the desired outcome of assessing the trustworthiness of a post:

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributor</td>
<td>Reputation</td>
</tr>
<tr>
<td></td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Popularity</td>
</tr>
<tr>
<td></td>
<td>Influence</td>
</tr>
<tr>
<td></td>
<td>Presence</td>
</tr>
<tr>
<td>Content</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td>Popularity</td>
</tr>
<tr>
<td></td>
<td>Reputation</td>
</tr>
<tr>
<td></td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Originality</td>
</tr>
<tr>
<td>Context</td>
<td>Cross-check</td>
</tr>
<tr>
<td></td>
<td>Diversity</td>
</tr>
<tr>
<td></td>
<td>Influence</td>
</tr>
<tr>
<td></td>
<td>Proximity</td>
</tr>
<tr>
<td></td>
<td>Provenance</td>
</tr>
</tbody>
</table>

Table 1: Pillars & Metrics Summary

Once users choose to analyse a tweet (post), they are led to the following screen which summarises the verification analysis results (summarising the results of the analysis on the circular diagram in the right part of the screen).

---

\(^2\) [http://www.truthnest.com/](http://www.truthnest.com/)
Clicking on any of the three category buttons on the left will reveal a web diagram summarising the results of the five metrics corresponding to the specific category. Clicking on any of the five titles of the metrics will bring the detailed results for this metric in the right part of the screen on a vertically scrollable column. For example, clicking on reputation leads to the following screen (the right column can be scrolled down to provide access to all results):

![Example screen showing detailed results for reputation]

The pie chart shows the sentiment of the most recent mentions this Twitter account has received. Clicking on the pie chart provides access to the actual positive, negative, or...
neutral mentions. Scrolling down the user can also see timelines with the number of mentions received, as well as a tag cloud with access to the users mentioning this user.

In a similar way, ‘Influence’ provides a sense on how influential this user is by providing information on the most recent retweets and replies received, along with sentiment analysis, timelines and tag clouds accessible by scrolling down the right column.

If a post contains an image, under the ‘Content’ category and the ‘Originality’ metric, the user can see whether the posted image (or a visually similar one) can be found somewhere on the web. These results are received by using the TinEye reverse image search service.
Under the ‘Context’ category the ‘Cross-check’ metric allows the user to see posts that appear to be discussing the same event. Clicking on ‘Analyse’ on any of these posts will lead to an analysis of the respective post in a new tab of the web browser used.

The ‘Proximity’ metric will provide three lists of locations for these similar posts:

- Locations textually mentioned in these posts
- Locations of these users while posting these posts (geotagged by Twitter in the cases these users have allowed this)
- Locations of the origins of these users as declared in their Twitter profiles

The above are just some indicative metric results. The user can always click on the Help button located in the bottom left, which will activate tooltips (visualized as small questionmarks) for every metric.

3.1.5.2 Fake post detector

The Fake post detection tool applies a supervised learning algorithm on the selected tweet in order to give an estimate of whether the tweet is credible or not (we use the term “fake” for simplicity). The supervised learning algorithm has been trained on a set of historic tweets that shared images and videos, which were found later to be fake or real, and could thus be used as positive and negative training examples respectively. The tool provides some cues through a number of “histograms” that illustrate the distribution of values for each extracted feature in the training corpus. To make this more clear, it helps to have a look at a few examples using the tweet of Figure 19 as an example.
Figure 23: Fake post detection results

In the following graphs, two histograms are shown: the left one corresponds to the feature “Contains question mark”, while the right one corresponds to the feature “Number of uppercase characters”. Note that these features (and many more of similar nature) have been proposed and used by state-of-the-art methods to assess the veracity of social media content. By inspecting the histogram on the left (“Contains question mark”), the journalist can first understand that the large majority of tweets (used for training) do not contain a question mark (i.e. the feature has value “false”). Out of those, it seems that not containing a question mark is more common among real tweets than among fake. So, since the particular tweet does not contain any question mark, there is a slightly higher likelihood that it is real. Similarly, from the histogram of uppercase characters at the right, it seems that considerably more real tweets have a value in the first range (0-5) compared to fake tweets, so this is an additional cue that this tweet is real. By inspecting such histograms over many features of the tweet and its user, a journalist may thus gain a better impression as to whether this particular tweet is real or fake.
3.2 REVEAL Enterprise application

The REVEAL Enterprise application is available at the following URL: http://reveals.atc.gr/revealenterprise/index.html

The credentials available at this time are:

- **User name:** atc
- **Password:** reveal123

The tools are developed under the research project REVEAL (http://revealproject.eu), supported by the European framework programme for research.

3.2.1 Social media stream monitor

When users log-in, they can set up streams based on key words, contributors, or events. The tool can provide streams for content currently coming from ARIS community (we are in the process of integrating content coming from the Twitter search API as well).

User are able to monitor the streams they have defined in separate columns and can also define new ones.

![Stream monitor view](image)

Figure 24: Stream monitor view
The user can create a new stream by specifying a set of keywords. The user may also configure the stream to include only posts by “Trusted” users (Trusted users feature currently not working).

By clicking the “show conversation” button on a specific post, a user can see the entire thread of the conversation referring to this post.
Also, by clicking on the “i” icon next to the username, the panel is expanded including some extra information regarding the specific author of the post.

By clicking on the title of the stream users are led to the Stream Analysis screen (see section 2).

### 3.2.2 Stream analysis view

This view is divided in three basic columns:

- The stream filters column consisting of 3 tabs (tags, entities and sentiment) (see section 3.2.2.1)
- The stream content column consisting of 5 tabs (Stream, Top users (see section 3.2.2.2), top posts (see section 2.2.2.3), Filtered posts, Communities (see section 2.2.2.4)).
- The user details, which is visible when a specific user is selected (see section 2.2.2.5).
3.2.2.1 Content filters

The user can see a set of filters in the first column (a tag cloud with most prominent tags in the stream) as well as a list of posts of the stream in a chronological order. The user can also filter out non-trusted user generated posts by selecting “only posts by trusted users” in the checkbox located on top of the list of posts.

![Figure 29: Tags (Tag Cloud) Filter](image)

The user can click on any of the tags appearing in the first column of the view inside the “tags” tab to filter the content by this specific tag. This automatically changes the selected tab in the main (second) column of the view and displays the posts that contain the selected tag.
Similarly, the user can select an entity from the entities tag cloud and filter the results, viewing only the posts that contain the selected entity.

Finally, the user can filter out the results based on the extracted sentiment, by clicking on the sentiment pie chart appearing in the “sentiment” tab of the filters column. This can be proven particularly useful for identifying reports to defects or issues on a specific stream.
3.2.2.2 Top users

The second tab of the “content” column provides a table of the top users of the specific stream. The table of top users can be generated based on the number of total posts including replies, the number of original posts, number of “likes” received, the influence or the number of received comments. In this way, we can have several representations of the most important users of the stream. The table also includes some basic statistics regarding the activity and popularity of the user.

![Figure 32: Top Users tab](image)

By clicking on a row of the table, the third column of the page (“user details” panel) is activated (see section 3.2.2.5).

3.2.2.3 Top posts

Clicking on the third column (Top posts) of the view, we can navigate through the top posts of the stream. We can get the top posts based on the following three criteria: number of views, number of likes, and number of comments. By clicking the “more” button, the user can open the full thread of the conversation of this specific post.
Figure 33: Top Posts

3.2.2.4 Communities

The last tab depicts the communities extracted automatically by the related analysis module of the platform (currently the communities are not created automatically on new stream creation). The table shows the density of the community, the keywords of the topic relevant to the community as well as the list of the community members.

Figure 34: Communities of a Stream

3.2.2.5 User details

The “user details” panel consists of five different tabs. In the first tab, the user can see an overview of the user profile. Moreover, the user can manually select whether this user is “trusted”. When the
user clicks on the checkbox, the user is immediately inserted into the “trusted users” lists and considered “trusted”.

Figure 35: User Details Panel (personal info)

The second tab of the “user details” panel contains the statistics of the account, including a sentiment pie and the various metrics of popularity and activity.

Figure 36: User Details Panel (account statistics)
The third tab of the panel contains the tags and entities that are found inside the posts of the user.

The fourth (trustworthiness) tab of the panel shows information about the trustworthiness of the user, as calculated automatically by the related analysis modules.
Finally, the last tab of the panel (role) provides information about the automatically extracted role of this specific user, provided by the related analysis module of the system.

The panel can also show information about the total posts of the user inside the platform, as well as the specific posts provided by the user in the specific stream.
Figure 40: User Details Panel (List of User Posts)

Figure 41: User Details Panel (List of User Posts in this Stream)
4 Conclusions

This deliverable described the training activities undertaken by the REVEAL consortium during the whole project’s lifetime. It also included a user manual for both the News and Enterprise REVEAL applications. Throughout the project’s duration, the training activities did not only provide an effective learning environment tailored to the specific user needs but also helped in improving the REVEAL platform due to the valuable comments received during the training activities. In addition, they acted as another dissemination channel promoting project’s results.

Building confidence and knowledge in the use of REVEAL platform, both from the perspective of the partners, content providers and most importantly the system users, was extremely important for the consortium and managing so, the project has achieved an overall success.