



Digital Clusters. How the Net Is Marking Us

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Abstract

This work examines the critical phenomenon of the conversational and information decay in social media. The Web user, protagonist of the network and its contents, looks trapped into large online structures where the claims are converging and polarizing. Through the analysis of several data, including digital illiteracy, cognitive biases, “fake news”, and fanaticisms, the work explores the connection between the narration from a Constructivist perspective and the social network dynamics.

A milestone of this transformation is the Eli Pariser’s «Filter bubble» study (Pariser 2011), describing a combination of methods to customize the user experience, started in late 2010 by Google, in its search engine results, and leading digital platforms like Facebook, Amazon, Netflix and others. These methods were initially based on few factors, collecting user data on a specific amount of navigation information, such as the number of *likes* on Facebook, the geolocation, purchasing choices, or the browsing history. Pariser reports a Google’s engineer reservedly talked him about 57 factors to give a customized search result, while Facebook adopted in 2011 the *edgerank*, an algorithm to manage the *timeline* results based on the preferences and user’s likes over the whole platform. After six years, the major platforms have deeply refined the filtering method. Google, Facebook and – recently – Twitter, have expanded their user “collections” to overtake thousands of information with an extensive use of big data and machine learning algorithms. However, mostly Facebook has increased the data mining and collecting operations, growing up to 100.000 factors per user creating large databases that label ideas, political views, social preferences, sexual orientations, religious perspectives, etc. As these data are continuing to grow, they outline increasingly accurate profiles of each user – while navigating through digital platforms and leaving digital footprints. In such plight, these profiling factors combine together with co-occurrent elements like fabricated *fake news* and known cognitive biases. These elements was both external to the platforms and facilitated by the same underlying logic of user choices and machine learning. Deepening the ambit of personal and collective narration, and how this is augmented and expanded in social media, the work describes larger digital structures surpassing the “digital bubbles”, marking out a context in which different subjects – both humans and algorithms – play a role to select contents and reinforce the loop. The fil rouge is the common narration: people tend to see only what confirm their ideas and perspectives, based on their experience. The Italian research «Anatomy of News Consumption on Facebook» (Quattrociocchi, Zollo, Del Vicario et al. 2017) showed how deeply the polarization effect on Facebook has grown up. Few major aggregations (pages, groups, influencer hubs) attract people in echoing chambers, where distorting models of information follow specific paths: engagement, propaganda, ideology. As a result, the profiling model adopted by the social networks on a large-scale factor create wider online structures that bind together different bubbles multiplying the filtering-biasing mix: these objects may be called “Digital clusters”. While the disinhibition due to the digital filters transforms conversation into decontextualized experiences, the network dynamics reinforce and manipulate the common narration; the insertion of fake news creates a “short-circuit” between narration, biases, polarized sources and algorithms’ action, and the distorted messages grow, amplify, and consolidate expanding in the digital media.

Published 28 December 2017

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DigitCult, *Scientific Journal on Digital Cultures* is an academic journal of international scope, peer-reviewed and open access, aiming to value international research and to present current debate on digital culture, technological innovation and social change. ISSN: 2531-5994. URL: <http://www.digitcult.it>

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Premise: The Context

In a preliminary approach to understanding the article's objectives, it is useful to underline some factors about the contextual path prior to dwell in some social network's aspects. The path has a pivotal approach on a common denominator: the narration and a distorted construction of reality. This construction is made of connected factors, and there are specifically two main distorting elements with a significant impact on the online users' experience: a widespread digital illiteracy, partially depending from the age, the country and the cultural environment, and a great distance between perceptions and reality – confirmed by several researches and recent studies¹. Digital illiteracy plays a crucial role in the understanding of social media critical issues. Even citing the *digital divide* issue² defined since 1999, we have to keep in mind that online conversation is mostly verbalized: digital communication is “not equal” to communication – while not all people think visualizing in words and sentences but in pictures, actions or images. The verbal communication is approximately one fifth of a communication act (Watzlawick 1967) and this percentage is still valid. Person's facial mimic, prosody, gestures, proxemics and in general the non-verbal language, are missing components. Although emoticons and videos try out to overcome this limit, it remains a verbalized ambit made of posts, comments, statuses, chats, blogs, etc. Hence, the more verbal communication is used – that's specific of social media – the more misunderstandings show up. It is common to consider non-verbal communication as secondary, and people are also more likely to be mean if they do not have eye contact³. In addition, the language is changing. It is not about analysing lending and neologisms but “understanding the functioning and changes of the language in its meeting with a new communicative environment” (Roncaglia 2011).

In Fig. 1 we can see the different digital skills in the main five European countries, as by a recent study published by Eurostat: United Kingdom⁴, Germany, Spain, France and Italy – plus the EU-28 average indicator. The Italian data is highlighted⁵.

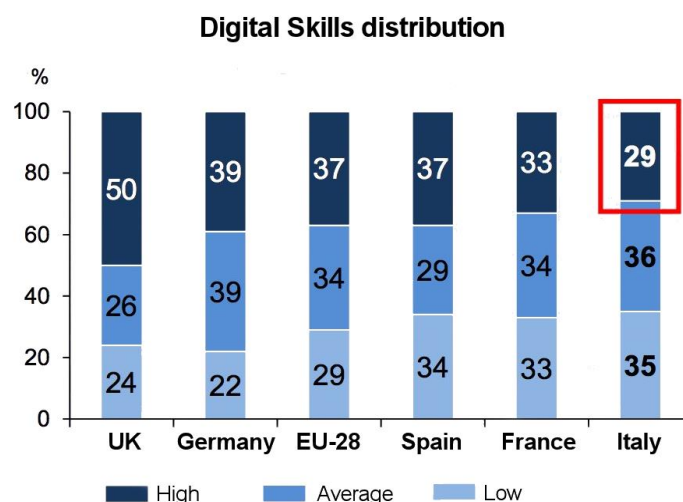


Figure 1. Distribution of digital skills in workforce (employed and unemployed). Source: elaboration on Italian Ministry of Economy based on Eurostat data (2016).

¹ Ipsos-Mori, 2014, *Perceptions are not reality: Things the world gets wrong*, <http://www.ipsos-mori.com/researchpublications/researcharchive/3466/Perceptions-are-not-reality-10-things-the-world-gets-wrong.aspx>

² F. Vannucchi, 2008, *Libro e Internet*, Milano, Editrice Bibliografica, p.14.

³ Forbes, 2012, *Is Social Media Sabotaging Real Communication?*, <http://www.forbes.com/sites/susantardanico/2012/04/30/is-social-media-sabotaging-real-communication/>

⁴ Please note that the measurement dates to 2016, before *Brexit*.

⁵ Eurostat, 2017, Digital economy and digital society statistics at regional level, http://ec.europa.eu/eurostat/statistics-explained/index.php/Digital_economy_and_digital_society_statistics_at_regional_level

Together with these two elements, there is a third factor we will analyse, that strongly ties the elements together – and it is the narration. Sometimes the narration is called storytelling, as in political or cultural ambits, and it can be correct. But in this ambit we will call and use the term narration from the Psychology field, in particular by the context of the Cognitive Post-rational branch (inside Constructivism), firstly theorized by the Italian psychiatrist Vittorio Guidano⁶.

As users “live” in the social media, they cross through several *filter bubbles* (Pariser 2011): narration is the common element that ties together the paths, in a way hardly visible from inside – and even from the outside. In this particular combination of elements, it is not only the bubble concept itself to mark the road of users’ navigation. Instead, this navigation remains apparently random: most social media users do not see neither their specific choices that influence the algorithms, nor the algorithms’ action, that reinforce the choices – in a typical *echo chamber* effect (Sunstein 2001). This can be called a loop, as this is the nearer word to identify this aspect, but there is a lot more to consider in the “endless circle”, that make complex both the part and the identification of the whole. The elements concurring to the digital aggregation of clusters – wider structures in which the paths cross each other – start from afar.

The Social Data

One of the most forthcoming effects of the *socialization* model is the widespread pervasiveness of especially one actor: Facebook. This social network has reached in the last year (2016) the number of two billions of active users, which is greatly significant if we consider that the global Internet population – on the same period – surpassed the three billions mark⁷. In fact, all the data about Facebook play a crucial role: it has not only the larger community compared with all other social networks, including Twitter, but it also bought social successful platforms like Instagram and embedded close applications like WhatsApp – without mentioning Messenger, which use for direct messaging between Facebook users is *de facto* imposed. This bigness creates a sort of giant sized “walled garden”.

What is interesting for our purposes is also considering where Facebook has more success, and where not: if in the Western world it is almost everywhere as the first social network, in the Far East and Russia it is not, but it is the second. China is a world apart where a giant firewall keeps out Facebook and other Web platforms from the general view⁸, allowing only local social networks and partial results from Google – but how long? In general, Facebook has grown up encompassing most of the debates in the political arena among democratic countries, setting an agenda for those who want to be present in the discussion. But the political debate is not the only knot: the weighty aspect is that the social network is currently *the news source* for most people. According to a recent study from Pew Research Center, in 2017 two-thirds of US adults get news from social media⁹. It is not a coincidence that the social platforms monopoly problem has been brought to the public attention (especially in USA) raising as a “public utilities” issue¹⁰.

In this ambit, it is newsworthy to observe **the social network distribution** in the world. The map in the figure 2 shows the first platforms in each country, consisting of a composition on a half-yearly basis of data by Alexa and SimilarWeb:

⁶ Vittorio Guidano (1944-1999) was an Italian neuropsychiatrist, founder of the Post-rationalist cognitive psychotherapy. Basing on the experience-centred cognitive interpretation, he conceived the personal system as a self-organized entity in constant development. He classified the self-explanation of reality in four Personal Meaning Organizations, through which the person attributes coherence to his/her beliefs and convictions (they are nominally OSS, DEP, FOB and DAP, derived from clinical names).

⁷ For updated data on the Internet population, consult *Internet Live Stats* <http://www.internetlivestats.com/>

⁸ The New York Times, 2017, *China blocked Whatsapp*, <https://www.nytimes.com/2017/09/25/business/china-whatsapp-blocked.html?mcubz=0>

⁹ Pew Research Center, 2017, *News Use Across Social Media Platforms 2017*, <http://www.journalism.org/2017/09/07/news-use-across-social-media-platforms-2017/>

¹⁰ The New York Times, 2017, *Is It Time to Break Up Google?*, <http://www.nytimes.com/2017/04/22/opinion/sunday/is-it-time-to-break-up-google.html>

World Map of Social Networks



Figure 2. World map of social networks (January 2017)¹¹.

Facebook dominates in North and South America, in almost all of Europe, in most of Africa, in the Arab States, in India and in Australia. In some countries, it is that Instagram immediately preceding it – whereas one year ago it was Twitter. In China the first social network is Qzone (QQ), while in Russia the primacy is held by VKontakte (also known as VK), which is closely similar to Facebook. On the other hand, the increasing importance and spread of mobile devices plays a relevant role. Not just the Millennials' (those born in the Eighties) use of the social media is relevant on handheld devices, but a lot more categories in different areas live and work in full mobility. From entrepreneurs controlling financial transactions to newsmakers providing contents via social media, there is a universe of companies that are *app-only*: Uber, Whatsapp and Now This¹², for example. Facebook itself bases a large chunk of its advertising income on the mobile devices' revenues, and the number of unique users accessing the platform from mobiles is over 1.1 billion¹³ – constantly growing. This continuous connection status has effects in several areas, one of which is an increase of unverified data and information that leads to a reinforcement of biases and perceptions, with some consequences¹⁴.

Perception vs Reality

False perceptions, one of the significant process in the normal route of human evolution, became a radical connotation with the progress of communication, and especially with the Internet. It may result as a contradiction. The "global village" initially seemed a smart way of connecting more people to different interests and ideas, but with the advent of social media has turned into something contrary. The Web 2.0 paradigm shift was a great opportunity to share and spread new ideas and perspectives to a broader audience. Unfortunately, social networks did not improve the attitude to explore extra contents on the long term: on the contrary, they have deteriorated this ability, locking people into homogeneous thinking groups and multiplying, with an exponential shape, the distance between perception of facts and facts. The British

¹¹ Source: Vincenzo Cosenza, 2017, <http://vincos.it/2017/02/06/la-mappa-dei-social-network-nel-mondo-gennaio-2017/>

¹² Uber, <http://www.uber.com>; Whatsapp, <http://web.whatsapp.com>; Now This, <http://nowthisnews.com>

¹³ Quartz, 2016, *Facebook has got mobile completely figured out*, <http://qz.com/825998/t/484280>

¹⁴ W. Quattrociochi, M. Del Vicario, A. Bessi, F. Zollo, et al. *The Spreading of Misinformation Online*, Proceedings of the National Academy of Sciences (2015), <http://www.pnas.org/content/113/3/554.full>

company Ipsos-MORI¹⁵ realized during the 2014 and 2015 two distinct large studies¹⁶ to assess the knowledge level of several countries and verify the perception of some social phenomena versus the data from official statistical sources. The overall sample was over 35,000 interviews, distributed as follows: in the 2014 14 countries, in 2015 the research expanded to 33 countries altogether. In particular, in 2014 were selected 14 countries: Australia, Belgium, Canada, South Korea, France, Germany, Japan, Great Britain, **Italy**, Poland, Spain, Sweden, Hungary and the United States. In each country was selected a national sample representative of the population aged 16-64 years (with the exception of USA and Canada where was considered the population of 18-64 years). The striking data of the widespread research was the **common tendency for all countries to overestimate or underestimate phenomena** – in other words, **perceptions do not match up in no category**. For example, observing the tendency to overestimate the number of immigrants present in general in each country; or the false perception regarding the job market, the average unemployment rate, perceived in 14 countries as of 30% against a real percentage of ~9%. On the contrary, people tend to underestimate the percentage of voters, as well as the religious distribution, disconnected from real data. The search results was used to establish the “**Index of Ignorance**”¹⁷, a self-explaining ranking of these discrepancies. Up to 2014 in this comparison, **Italy was in the first place**: what has emerging in the country is the greater deviation between perception and reality than in all other countries of the first study. The answers given by the Italian champion were the furthest from the actual numerical data provided by the institutions¹⁸.

The strictly correlated major issue is the **digital illiteracy** – together with the so-called “functional illiteracy”. As of terminology, the OECD defines¹⁹ functional illiteracy a person's inability to read, write and make calculus in an elementary and ordinary way, but is able to write his own name, use writing and calculating in everyday life. A functional illiterate is a person who knows how to write, use Facebook, but is not eligible to “understand, evaluate, exploit and get involved with written texts to intervene actively in society, to achieve its goals and to develop their knowledge and potential”²⁰. In Italy, data do not look too good: almost an Italian out of three is a functional illiterate. This is a result of United Nations study, distributed to celebrate the *Day of literacy*, which in this year was dedicated to the «digital»²¹.

The combined effect of these data is that information currently tends to rely on three elements: i) the stereotypes, ii) the opinions of common friends, and, above all, iii) the social media²². In the above-mentioned study from Pew Research Center, two-thirds (67%) of Americans get at least some of their news on social media – with two-in-ten doing so often, and this is a modest increase since 2016. Often, there is no access to the sources – especially to the primary ones – while there is a series of “continuous revision” and reinterpretation from unverified sources, questionable magazines and Facebook pages modelling a social news consumption strongly polarized²³. With a pattern: a coherent narration.

¹⁵ Ipsos Group, <http://www.ipsos.com/en>

¹⁶ Ipsos-Mori, 2014, *Perceptions are not reality: Things the world gets wrong*, <http://www.ipsos-mori.com/researchpublications/researcharchive/3466/Perceptions-are-not-reality-10-things-the-world-gets-wrong.aspx>

¹⁷ The Independent, 2016, *These are the world's most ignorant countries*, <http://www.independent.co.uk/news/world/world-most-ignorant-countries-index-ipsos-mori-poll-survey-a7481196.html>

¹⁸ N. Pagnoncelli, 2016, *Dare i numeri. Le percezioni sbagliate sulla realtà sociale*, Bologna, EDB, pp. 19-35.

¹⁹ OECD, 2000, *Literacy in the Information Age. Final Report*, <http://www.oecd.org/edu/skills-beyond-school/41529765.pdf>

²⁰ OECD PIAAC, *Programme for the International Assessment of Adult Competencies*, <http://www.oecd.org/skills/piaac/>

²¹ Agi, 2017, *Quasi un italiano su tre è un analfabeta funzionale. Una (triste) classifica*, https://www.agi.it/data-journalism/alfabetizzazione_digitale_italia_onu-2135455/news/2017-09-09/

²² Pew Research Center, 2017, *News Use Across Social Media Platforms 2017*, <http://www.journalism.org/2017/09/07/news-use-across-social-media-platforms-2017/>

²³ W. Quattrociochi, A. L. Schmidt, F. Zollo, M. Del Vicario et al. *Anatomy of news consumption on Facebook*, *Pnas* (2017), <http://www.pnas.org/content/114/12/3035>

The Narration

In this complex situation, the narrative path takes its place. Each of us live in a narration: it can be more or less adhering to factual reality – and it depends on culture – but it is an historical “fact” that people tell stories (including themselves) to maintain a coherence in life shortcuts and connections of sense.

In this part, we do a brief excursus into the psychology to see how personal experience and its narration – subjective and collective – play a key role in the communication process, and to understand how a distorted narration make visible effects in the online environment. To do this we will use the constructivist model, in particular its «Post-rationalist» variant initiated by Vittorio Guidano²⁴ in the Nineties, and continued by several psychiatrists and neurologists in the field of research in cognitive psychology. The topics considered in this context are very summarized for the needs of this paper: refer to the note for a short insight on the PRCP²⁵.

We cannot analyze the context of digital aggregations without deepening the concept of **personal and collective narration**. Each aggregation (cluster) can be observed – although not classified – only considering it as connoted by a narration, a linear tale not corresponding to a specific reality but with certain attributes: it is believable – possibly conveyed by people believed to be reliable – and is made viral by a social dynamic. To understand the unfolding of coherent content through different components of clusters, there must be a link between the same narration among them.

As an example, we can consider the widespread narration of the “Predatory State”. This is a State which no longer operates *for* citizens but *against* them, implementing new initiatives only for ideological and harassing purposes. It is a “tale” that can be easily adapted to many news: **the *fil rouge* is the identical narration among digital objects**, from social comments to Facebook pages, images, or videos up to magazines (whether they come from known sources or not) – often decontextualized and poorly reported.

In the context of the Post-rationalist Constructivist model, people bring their own story, both in real life and online, where we focus now. In the social networks, they can find similar narrations that in the complementary components become stronger, find confirmation, recognition and finally legitimacy. To understand the value of these narrative experiences and whether – and how much – an interpretation is correct or not it is a personal work. However, since everyone is immersed in a narration, for the purposes of this process is interesting not a specific judgement but to analyze how the narrative experiences and their structures grow up.

The starting point is the **subjective experience**: “experience is the relationship between the world and us and it manifests in our consciousness starting from the emotional reaction”: the inner reaction reveals the subjective value of an event for us²⁶. This is influenced by the context, by the individual history, by the temperament (regarding its quickness, duration and intensity), and the historical and cultural contexts of belonging». However, the emotional reaction follows

²⁴ Above-mentioned.

²⁵ Post-rationalist cognitive psychotherapy (PRCP) focuses on the relationship between subjective experience and reflective explanation. Although this is a powerful, innovative, and flexible model, some aspects are still under further development. The model currently proposes the integration of PRCP with some principles of phenomenology, i.e. experience has a meaning that precedes reflection. It is structured according to “manifestation rules” that connect feelings, thoughts, and actions; personal identity is grounded in the action and cannot be reduced to what remains identical throughout the life course. The key aspect is the examination of the interplay between experience and explanation. Therapy focuses more on the understanding of experience than on its verbally mediated evaluation. Moreover, it aims not so much at revealing the rules through which the patient relates his experience to him/herself, as at bringing to light all the relevant aspects of the patient’s experience, validating the experience by making explicit the links, enabling the person to take hold of his/her experience, and leading him/her to learn how to understand it without the mediation of reflection. The knowledge of the tendencies, characteristic of each Personal Meaning Organization, to find difficulties in grasping specific aspects of experience helps the therapist identify the sequences of experience that are not sufficiently articulated and understood. The therapeutic procedures are identification, exploration, validation, and narrative reconfiguration, as they are finalized to reduce the ambiguities and self-deceptions between narration and experience.

²⁶ The quoted sentences and some parts of the paragraph are excerpts from a personal translation (authorized by the author) of: Gaetano, Paola et al. “Una psicoterapia cognitiva centrata sull’esperienza: verso una terapia fenomenologicamente orientata”, *Rivista di Psichiatria* (2015) 50 (2):51-60, doi:10.1708/1872.20448, pp. 52-55.

fundamental and universal rules, which push to action and enables the linguistic sort of the live events. The sorting sequence predisposes to a certain interpretation of the causal connections or the motivational links.

Understanding the experience means grasping intuitively the sense of this: in other words how the social and personal context affects the emotional reaction to an event, and how this reaction influences the behaviour. This understanding level is the deepest and most difficult to acquire in its complexity and accuracy. In most cases, people are located in another level, where they makes an “explanation” of the emotional experience, and make an interpretation of it. *Interpreting* experience is an automatic and spontaneous act, since people live in a social context where they “speak” to themselves and to others, and must hypothetically “figure out” how they feel and what they do. When the interpretation relies on understanding, a person can catch with a good level of genuineness the meaning of the events. Instead, when interprets it basing on preconceptions, the person can “fold the experience” in order to maintain the *internal coherence* with the personal beliefs, ideas, and traditions as well.

The “Personal Meaning Organization” theorized by Vittorio Guidano (Guidano 1991) illustrates some of the distortions in the act of interpreting the experience, in order to keep the personal meaning constant and to maintain the oscillations of the “sense of Self” in a context of controllability. This is where the “tale” comes in, which we call narration. Since people have a tacit pre-sorting of the sense of Self, which derives from the caregiver attachment pattern (Bowlby 1990), they also maintain a continuous need to translate experience into a narration that confirms and reveals such sorting rules.

In his theory, Guidano identified four major meaning organizations, which take their name from the Clinic ambit – OSS (Obsessive), DEP (Depressive), FOB (Phobic) and DAP (Psychogenic Food Disorder) – but virtually there can be others, which reflect the same interpretative model. To have a narration is not an error, per se: if this is based on the understanding of emotional experience, it makes the motivational connections between the various aspects of living explicit. In this case, it becomes possible to reflect on the personal and universal meaning of what happens “pre-reflexively” (at an intuitive level) in consciousness. If it is built on the distorted interpretation of the experience, then the pre-sorted connections do not emerge and the thinking leads to conclusions based essentially on personal aspects, “told” to fit the internal coherence without matching what happens. This misalignment is the foundation of personal unhealthy narrations, whereby people tell a story that do not exist in reality. When the tale is built in this sequence, it is linked above the need of justifying emotions and actions to others and to self, and order facts to bend to the pre-existing vision. In the next step people with the same narration, build a collective tale that is even more complicated and even more distant from the experience, which can be seen from inside and outside. From within, people with the same narration will stay each other in convergence of visions and conclusions. From outside, an external observer will face a cognitive wall difficult to cross: in our ambit, it is a digital bubble.

Distorted narrations are encouraged by the “fake news” phenomenon, artfully (more often) or unintentionally created – not from now –, organized with specific purposes and spread online.

The Fake News Generation

Usually, the narrative construction of false information is built with accuracy, and it is particularly aggressive with the aim of provoking outrage, typically in the news arena – where the alertness is maximum. The trick is apparent from the title, the *clickbaiting* technique: the words are carefully chosen to attract attention – albeit with false or questionable information which poorly match with the content. Hence, the false news are contents made of different elements – sometimes true and false mixed together – in order to achieve a major target, be it commercial or ideological. Example of the first are those who gain a profit from spreading false news²⁷; example of the second is a political propaganda built on falsehood²⁸.

The priority is the attention of who is following that narrative path, and once in, it becomes difficult for the average reader to distinguish real facts from false information as well as the objective data from questionable opinions. The most common situation, in fact, is a content

²⁷ BBC News, 2016, *The city getting rich from fake news*, <http://www.bbc.com/news/magazine-38168281>

²⁸ The Guardian, 2017, *Donald Trump's team defends 'alternative facts' after widespread protests*, <http://www.theguardian.com/us-news/2017/jan/22/donald-trump-kellyanne-conway-inauguration-alternative-facts>

mashup that combines both real facts (such as current events) and falsehoods – without precise references to the sources. The pointer is often put on social networks – typically Facebook pages with a huge base of followers – for a short time and with scarce indications, becoming viral. The pointed content is herein published on quite anonymous websites, recalling real online newspapers in the name – i.e. using the number “24” combined with “news” or “daily”, often declined in the local language – to mould an apparently reliable online resource.

The result of an intricate network of “fake news generators” is obtained multiplying this activity by hundreds and thousands of times. Apparently, it is without connection, but several markers bring to two main purposes: ideological and economical. When it is ideological, often hidden (or even intelligible) political parties sponsor the network. When it is economical, could be not a surprise find that this type of content management *is a good business*. Though not ethical at all²⁹.

Hence, the fake news – as we define them – are completely invented information objects, distributed as true news by editorial networks or political organizations. Historically, they do not represent really a novelty, but the pervasiveness and spread of social networks make these objects exploiting a global virality they never owned.

Echo Chambers and Polarization

A recent research coordinated by Walter Quattrociocchi (IMT, Lucca, Italy), *Anatomy of News Consumption on Facebook*³⁰, has brought another important contribution to this work. It is based on the most widespread social network study, with a span of six years. The study analysed the interactions of 376 million Facebook users, from January 2010 to December 2015, with 920 sources of global and local news, including New York Times, Guardian, Huffington Post, Associated Press, government agencies and no-profit organizations. The results were very interesting and partly confirming already known and exposed data.

We can identify three aspects that distinguish the search results: **radicalization, localisation, and clustering**. The first is the data on which the researchers have more insisted in presenting the study: they explicitly cited a “segregation” model in the news consumption. Specifically, in an incremental polarization dynamic, the readers draw from a progressive decreasing number of sources: only those that meet with their narration of reality.

“They cluster into sharply defined communities based on the [news] outlets with which they interact; a model (...) driven by confirmation bias reproduced the observed community structure, suggesting that selective exposure dominates news consumption online, creating a segregated environment”.³¹
(*Anatomy of news consumption*, 2017)

In addition, disassembling the fake news or legends with fact-checking and scientific articles, is not definitely conducive to truth, as demonstrated by the aforementioned study on PLOS³².

“What Quattrociocchi found may have deep implications for the future of online fact-checking. Facebook users who cluster around conspiracy-related content tend to interact only with material that affirms their pre-existing worldview, but in the rare cases when they do come into contact with dissenting information that attempts to debunk conspiracy theories – in the form of public posts by science-related pages – the conspiracy theorists become more, rather than less, likely to interact with conspiracy-related content in the future. In fact, conspiracy theorists who never interact with dissenting viewpoints are almost twice as likely as those who do to

²⁹ In a similar approach, the above-mentioned “Alternative facts” by the former Counselor to the President Trump, Kellyanne Conway, pronounced in a public television interview on January 22, 2017.

³⁰ W. Quattrociocchi, A. L. Schmidt, F. Zollo, M. Del Vicario et al. *Anatomy of news consumption on Facebook*, *Proceedings of the National Academy of Sciences* (2017), <http://www.pnas.org/content/114/12/3035>

³¹ *Ibid.*

³² W. Quattrociocchi, F. Zollo, A. Bessi, M. Del Vicario et al. *Debunking in a world of tribes*, *PLOS* (2017), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181821>

eventually drift away from conspiracy-themed content"³³.
(Christian, 2017)

The Digital Clustering Process

The narrative constructions we are examining do not have so a pervasive and permanent connotation until they are pivoted online: hereafter the dynamic changes dramatically, in a process that has a specific proceeding. The rapid propagation due to the social dynamics increases the potential and reinforces the biases with the erroneous perceptions. These perceptions, transferring to social networks, are welded to the algorithms filtering, feeding their respective digital bubbles. The welding between the narration and the digital bubbles inhibits the correct narrative reconfiguration – what can be deduced from the “understood experience of reality” (Gaetano et al. 2015, 51-60). It also feeds the interaction between more digital bubbles that start aggregating in larger formations, with the same mechanism. The process can arise in any context, but on the online medium get quickly strengthened and in large numbers, due to the combination of the choice selection and the scale-free network typology.

It is interesting to observe the possible interweaving in the two propagation directions. Between the first direction (from the real ambit to the digital ambit) and the opposite direction (from digital to real), there is not a biunique correspondence – at least pre-set. Nevertheless, the result of the digital experience so built and reinforced reverberates in the interpretation of the reality, influencing it.

In the process, there are different elements that can be described in a multidimensional articulation – not necessarily in the listed order:

1. The “post-truth”, *Word of the year* 2016³⁴, represents the **likelihood**, or the blend of true news together with false news. It creates a continue enthymematic online environment: in this level the reader is subjected to a selective pressure, which makes it difficult to decipher what is “true” or “not true”, specially in a context of scarce literacy or low digital skills.
2. The narration implemented among the different social levels often run in competition with the fact-checking, a recent initiatives created by journalistic initiative, with the aim of evaluating online information (it is also known as *debunking*). When the narration (the one we are referring to) binds to the storytelling throughout the different media, it becomes the instrument of a widespread post-truth diffusion. It brings out the “coherent” ideological dimension, which reinforces the polarization dynamic. It makes the fact-checking criteria almost useless, limited, or even with a contrary outcome (“They say it is untrue just because it is true!”), as demonstrated in the mentioned study by the Italian team of Quattrococchi³⁵.
3. People do their choices in the online environment, creating their own paths and searching for their existing narrations. They bring together cognitive biases, which influence the online choices relying on the information they hold, and identify specific knowledge pathways on a conscious and unconscious level.
4. The algorithms, basing on increasingly refined parameters (only Facebook’s new Edgerank uses more than 100.000 factors)³⁶, select the big data settled from the users’ actions to meet their tastes. Machine learning algorithms can make accurate predictions on what is considered “relevant” to the user, presenting a personalized content (the search results in Google) as well as an engaging information (the *timeline* news feed in Facebook).

³³ J. Christian, *Is There Any Hope for Facebook's Fact-Checking Efforts?*, *The Atlantic*, <https://www.theatlantic.com/technology/archive/2017/09/facebook-fact-checking-challenges/540192/>

³⁴ Oxford Dictionaries, *Oxford Dictionaries Word of the Year 2016 is...*, <http://www.oxforddictionaries.com/press/news/2016/11/17/WOTY-16>

³⁵ W. Quattrococchi, F. Zollo, A. Bessi, M. Del Vicario et al. *Debunking in a world of tribes*, *PLOS* (2017), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181821>

³⁶ J. Constine, *How Facebook News Feed Works*, TechCrunch, accessed September 6, 2016, <http://techcrunch.com/2016/09/06/ultimate-guide-to-the-news-feed>

At this stage the selection process is characterized by phenomena that reinforce each other:

- The content filtering (the “filter-bubble”) becomes automatic and not transparent. In other words, the user is not informed about the content is not seeing³⁷.
- In social media, the huge amount of new contents create a notification syndrome, which continuously activates the well-known gratification mechanism (“No new notifications? Let me see if anyone wrote something”); in the next stage it may results in a RFI (Retrieval-Induced Forgetting), a memory phenomenon where new content remembering generates forgetting of other information in memory (Anderson et al. 1994).
- In the echo chambers, the confirmation bias plays its fundamental role, letting people get into a series of digital spaces where they search for agreeable ideas and data; that they find, and where they remain, because algorithms believe it is precisely what “they want” – not being much wrong.

The Hate Speech

As the process takes its structural form, especially on Facebook and Twitter, it leads to a dynamic of reinforcement and hyper-polarization, which depresses the peculiarity of the social network platforms to facilitate confrontation and dialogue; on the contrary, it often fosters aggressiveness and closeness, in an attack and defense scheme. In some cases, it generates the phenomenon of the *online hate speech*, strictly connected (Ziccardi 2016). It also proceeds from the combination of several factors, including:

- Social anger produced by real problems, like the loss of work or a disadvantaged social situation.
- The distorted perceptions like the erroneous data reading, or political and religious ideologies.
- The aforementioned network dynamics, which reinforce and manipulate the narration.
- Finally yet importantly, the **disinhibition** created by the medium filter and the physical distance. Being face to face or being behind a screen is not the same thing, although the theoretical duality between “online” and “offline” tends to be decreased with the increasing of connected devices. In people that are predisposed it can encourage verbal violence, transforming the debate into a decontextualized and dehumanizing experience, often unknowingly – due to the medium education lack.

The Digital Clusters

Once in the process, the insertion of the fake news (as we defined them: entire false data) create a dangerous “short-circuit” between the narration, the confirmation biases, the polarized media outlets and the algorithms filtering leverage. Hence, the distorted message grows and amplifies, consolidating and strengthening the false data, expanding into the network with a viral dynamic. At this stage, the correction (debunking) becomes difficult and often unsuccessful³⁸: A repeated lie hundred, thousand, a million times becomes a truth³⁹. From the dominant narration, the focus is passing to the narration dominated, repeated in thousands of groups, sites and social pages with hundreds of thousands of users.

³⁷ One of the first examples of the concept management was the famous “Unknown unknowns” of Donald Rumsfeld in a 2002 press conference.

³⁸ W. Quattrociocchi, F. Zollo, A. Bessi, M. Del Vicario et al. *Debunking in a world of tribes*, PLOS (2017), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181821>

³⁹ It is a motto commonly referred to J. Göbbels, the Ministry of Propaganda of the Nazi Third Reich.

What we are observing now is the **combination** of narrative configurations and network properties, user choices, cognitive biases with echo chambers, false data and media outlets producing polarized content, along with filter-bubbles. This cluster – having in common the same narration – concurs to the formation of larger structures, which aggregate several digital bubbles. We can think, with a reckless analogy, to the formation of the galactic clusters that contain planetary systems and stars groups. In a first research recognition, we tried to give a representation of these aggregations, which we named “digital clusters”, because of the similarity just proposed, giving them some indicative characteristics.

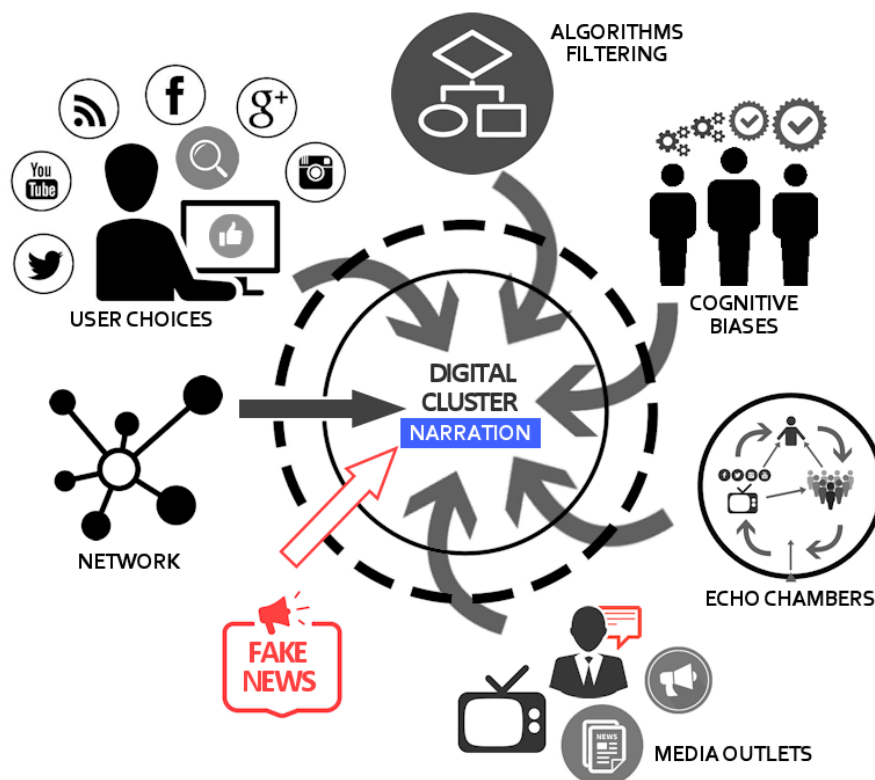


Figure 3. Digital cluster composition map.

As can be seen in Fig. 3, Digital clusters are composed – in an initial settlement – of at least six elements, plus one (in red) injected as “fuel”, which contributes to maintain the aggregation on a coherent cluster narration, at the center. The constituent elements of this arrangement are:

2. The network topology, which forms the social grouping by kinship and determines the geolocalised proximity.
3. The user choices in the social media, which iteratively refine the bubbles formation process within which they might stay.
4. The cognitive biases, which act both on the user (actively) and on the aggregate bubbles (passively).
5. The algorithms, which show most of the time a filtered content (within the filter bubbles) and strengthen the biases.
6. The echo chambers, which weld the biased content by increasing the cluster's aggregate capacity.
7. The media outlets, inserted in the echo chamber where they produce specific content for different bubbles, which can belong to multiple clusters and be affected from these ones.

8. The fake news, which contribute to a dreadful short-circuit where misconceptions are enforced and false convictions confirmed.

In some cases, fake news may become a “product” of the stack, instead of an injected element fabricated outside, albeit at a different stage. The condition of that is the unawareness, or in other words, the elements that build up the social dynamics tend to repeat false data because considered true. It relies on some obliviousness in journalism and the lack of appropriate checks, which loops the unverified information among several media outlets – reinforcing the cluster. However, current fake news generation looks more like an “industry”, a poisonous fabrication model where stories based on false or unverified data spread knowingly to create resentment, indignation, disapproval, be it to orient cultural direction or to gain commercial advantages⁴⁰.

The choice of the narration as the digital cluster’s central binder is based on the model of human correlation between experience and reality. This correlation is expressed in the sense of self, as people “construct” their identity and visions accordingly (Guidano 1991) to **personal beliefs, convictions, biases and ideas**, determined in the childhood (Bowlby 1990) and consolidated in adolescence and adulthood, eventually reinforced or confirmed by a cultural ambit. As mentioned before, each person has to preserve a coherence over time between what are the facts and what are these beliefs: if this two do not match, the narration comes in help at an unconscious stage to solve the inconsistency (please note the conditional *if*). Hence, the person distorts the discrepant facts to address the self-convictions and so maintain the sense of self in that ambit. That said, in a previous age where information was limited to single groups or in a literal ambit, the probability that wide distorted narrations spread over was poor and needed considerable efforts – or brute force. In the age of information, and specifically in the age of social media, people that live in a narration can find other people believing in the same narration easily, and reach the aggregations that confirm the beliefs – be they real or not. What is under observation here, is that in the last years some new elements contributed to increase what initially were “bubbles” creating – under some circumstances – “clusters”. The constituting elements described above may be not all present at the same time, but their relevant majority points out a high percentage of a digital clustering. As a note, an external observer might not see the narration binder, if in the same narration.

Digital clusters do not tend to repeat themselves “as-is” in the reality, as they mostly show a virtual aggregation pattern: in other words, they are built up online and do not correspond to equal structures out of digital media – except in particular cases. **The point of contact with reality is the narration**, which is the same at the centre of each cluster. It is the cultural context to determine one or more digital bubbles in common, and the clusters can combine them in the coherence of a common narration. Moreover, it is not the purpose of this work to classify clusters, because the possible bijective correspondence (one-to-one) between the individual bubbles occurs only between “offline narrated reality” and “online narrated reality”. In some cases, they can determine stable configurations with the character of permanence. Together with the content filtering and the social media dynamic, those who are in the cluster can strengthen their biases through multiple sources. In this regard, both media cauldron and people beliefs hold the clusters together.

It is necessary to keep in mind two elements: these groups could not exist in such a pervasive way and with these numbers without the digital platforms, which pull together all those narrations distant in time and space. Moreover, in the **de-contextualization of experience** that those models produce, the narration becomes still more distant from the reality, placing the shared experiences in a “non-virtual place” that is transmitted and verbalized.

Final Considerations

A digital cluster can contain online representations of social, political and religious ideologies. In recent events, an imprint of this type is recognizable, as an example, in the American «Alt-right» movement, grown up in the United States during the Presidential elections in 2016, contributing to the victory of Donald Trump. Certain characteristics can be comparable to a digital clustering mapping model: it was created via an online basis with the extreme right-wing website *Breitbart*

⁴⁰ CNN Money, 2017, *The Fake News Machine*,
<http://money.cnn.com/interactive/media/the-macedonia-story>

News⁴¹; it spread its ideology and data among social networks; it combined a strong narration that ties together several digital bubbles and the related echo chambers: nationalism, anti-Semitism⁴², xenophobia, white supremacy, hate speech against immigrants, religious fanaticism, American Nation “enemies” fight⁴³. Finally, it was alerted up with fake news, be it from supporters or from unidentified “Russian hackers”⁴⁴.

It is interesting to note that for those inside the digital cluster, ideas and behaviours of other people’s cluster look deeply wrong and vice versa. To simplify, we might consider a sort of a symmetrical “Alt-left”, polarized in an alternative common narration. The process is almost unaware: people in the first cluster will believe their ideologies are right and need people dedicated to pursue them. At the same time, people in the other cluster strongly believe that their ideologies are the “right” ones. There is a way out of this territory made of reciprocal distrust? Yes, it is another part not reported here since exceeds the scope of this work. It relies on the ability of people to “get outside the bubble” (one at a time, hopefully) and make a short step in the other’s bubble – letting each remain within the own cluster, clearly. This ability requires, among other conditions, strong communication skills, and it is not as simple as it can appear. Where appropriate, this topic would be addressed in a different article.

On the other hand, the work was deliberately restricted to a democratic context. It is likely that similar online dynamics may also be used, with evidently much more brutal methods and results, in terrorist organisations.

On that final note, the fact that such clustering is not only an American prerogative, nor only of politics, can be easily observed. This model can be found, for instance, in the large conspiracy clusters, or in all the online movements that bring together people with a coherent narration, be it in medicine, health, food, and so forth.

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⁴¹ BreitBart News, <http://www.breibart.com>

⁴² ADL, 2016, *Alt Right: A Primer about the New White Supremacy*, <http://www.adl.org/education/resources/backgrounders/alt-right-a-primer-about-the-new-white-supremacy>

⁴³ The Intercept, 2017, *How White Nationalism Became Normal Online* <http://theintercept.com/2017/08/25/video-how-white-nationalism-became-normal-online/>

⁴⁴ The Root, 2017, *How Russia Used Racism to Hack White Voters* <http://www.theroot.com/how-russia-used-racism-to-hack-white-voters-1797582833>

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