Infographic, data visualization, and the danger of reality distortion: The case study of Australia fire 2020

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Abstract. Nowadays, the stream of information to promote environmental consciousness are profoundly dominated by the existence of infographics and data visualization. Beside visually attractive, it is crucial for them to deliver a clear and concise information. This research will uncover infographics and data visualization in conjunction with news about the fire in Australia continent, early in 2020. Some of these visualizations were potentially giving a misleading interpretation to its reader. This research aims to explore the effectiveness of infographics and data visualization channel from the perspective of visual communication design discipline; both from its aesthetics dimension and its content data accuracy. As the outcome, this research is expected to be a reminder that the amount of information in the world is limitless. It is our shared responsibility to be mindful towards each and every material that we consume and share with others.

Keywords: infographics, data visualization, Australia

1. Introduction

1.1 Australia bushfire

Global ecosystem and environmental problem have been more and more becoming sources of concerns lately. Starting from the issue of global warming, climate change, waste management problem, floods and other natural disasters. It is recorded in the radar, that starting in 2019 to early 2020 there has been a series of bushfires that eventually transformed into some persistent forest fires in the Australia continent. So great the enormity of the fire at some point a pair of gigantic blazes in southeastern part of the continent has fused into single “megafire” with the size triple as large as any documented fire in California. In late January 2020, it was registered that these fires have claimed the lives of more than 30 citizens, approximately one billion fauna, destroyed up to 3,000 properties and land with the coverage grander than New Hampshire and Massachusetts combined [1][2].

Crystal Kolden, an expert in fire science at the University of Idaho, whose research focuses on distinguishing and understanding wildfire, explained that while some biotas are prone to fires and will come back; but Australia possesses some really incredible remnants of flora, populated by species fundamentally since the dinosaurs period, which unfortunately are not tailored for fire; and once they burn, they will be vanished [3]. The world closely followed the progress of the fire through journalism articles that reported the on-ground situation in real time; both in printed and online media. On February 13th, after some torrential rains, New South Wales as the most affected state, were finally...
contained the fire. And on March 2, after some 240 days, the Rural Fire Service of New South Wales affirmed that the fire is finally ended.

Journalism evolves in unison with the changing of the time. Whereas in the past communication were dominated by texts in paragraph with pictures as its complement; nowadays we are faced with another type of communication: infographic and data visualization [4]. This trend is also applied to articles related to the fire in Australia – many of which using graphic visualizations as tools to deliver the information.

2. Methodology
This research used qualitative method consists of case study, online interview and questionnaire, and data collection from journals and articles. This research will highlight the use of infographic and/or data visualization, specifically in the case of journalism for the recent Australia fire 2020. It will thoroughly discuss visualization of Australia fire from the artist Anthony Hearsey which became viral in early 2020. It will explore the effectiveness of these tools from the standpoint of visual communication design discipline; both from its aesthetics aspect as well as its data reliability. To do that, firstly we will examine the use of infographic and data visualization, starting with its general history followed by a close examination of Hearsey’s visualization. Next it will discuss the role of internet and social media in spreading public information, including the role of influencers and the danger of fake news. In the end it will maintain that infographic and data visualization are one of the best agents to communicate and sharing information, but it needs to be treated with proper cautions.

3. Infographic and data visualization
Using pictures as a tool for communication is not a new phenomenon. On the contrary, it has been suggested that as early as 73,000 years ago, people have communicated their ideas by drawing pictures on rocks and caves [5]. These prehistoric evidences have been found all over the world, from South Africa, Altamira in Spain, Bhimbetka in India, Lascaux in France, Indonesian island of Sulawesi and Borneo, and many more. Time leaping to our current times, we live in a world surrounded by visual representation of information: maps, signs, diagrams and charts, icons, and other online visuals – all of which examples of visual communication. However, they are not all infographics [6]. Formally, infographic is defined as “a visualization of data or ideas that tries to convey complex information to an audience in a manner that can be quickly consumed and easily understood” [7].

While for most people infographics are thought to be synonymous to data visualization, but for infographic designer, these two terms have different significances; since the later term are restricted to visual representation of numerical values [6]. According to Krum, infographics has been evolved to be “a larger graphic design that combines data visualizations, illustrations, text, and images together into a format that tells a complete story.” Therefore, he added, a good infographic design is more about storytelling, instead of mere attractive data visualization [6]. In a study in 2016 with more specific scope on infographics in the form of smartphone screen-shaped internet posters, infographics are claimed to have the potential to rapidly deliver detailed information in a visually stimulating approach, which effectively inspire its reader to grasp complicated informational texts [8]. Therefore, it is not surprising that many articles reporting the Australia fire were using infographics as its supplement.

3.1. The use of infographic and/or data visualization to report the fire problem in Australia
Amongst many infographics accompanied articles and reports on Australia fire in mass media, there is one visualization that powerfully stand out (here we opt to use the general term ‘visualization’ because of the convoluted nature of this particular image that is being discussed). This visualization seemingly opened the eyes for many of its reader on how dire the situation was in the Australia continent, back then when the fires were still on-going. Once it was published, this visualization became an instant viral on social media, notably for its ability to capture and deliver a single message, arguably in less than a second. The visualization depicts the map of Australia continent dominated with black and red/vermillion colors all over its regions (Figure 1).
This visualization started as a personal project created by Anthony Hearsey – a Brisbane-based artist specializes in photography and post-production. Hearsey admitted that he did not realize that his creation – which started as an experimentation test of a new render tool, would go viral in the first place. For the purpose of this research, we did an interview with Hearsey himself, where he explained that he interested in the style of 3D topographical maps and what he made was basically an extruded map. According to information in his then updated Instagram post as seen in Figure 2, this image is a 3D visualization of the (fire) hotspots in Australia, based on data from NASA’s Fire Information for Resource Management System from 5 December 2019 to 5 January 2020, which can be seen in Figure 3. Hearsey also confessed that the image scale is rather exaggerated due to the render’s glow. The visualization as a whole is a composite, and not in any way a satellite photo. Therefore, he encouraged people to think of it as a graph instead of a photo, and to understand that this was meant to be an art
piece. Furthermore, he also provides a link for the Australian website, MyFireWatch (Figure 4), as another source for people to see information regarding the fire.

![Figure 3. NASA’s FIRM Website](https://go.nasa.gov/2yRitK8)

**Figure 3.** NASA’s FIRM Website
(Source: https://go.nasa.gov/2yRitK8)

![Figure 4. MyFireWatch](https://myfirewatch.landgate.wa.gov.au/)

**Figure 4.** MyFireWatch
(Source: https://myfirewatch.landgate.wa.gov.au/)

3.2. **Dissecting the visualization: the role of color**

In actuality, the information in a mapping data has been widely available not just for Hearsey but for anyone to see. All these fire map data images use a very simple yet effective way to deliver the message: by using color. Without further explanation, people can readily assume that the dots of color represent the fire hotspot. Color, as an omnipresent part of our lives, affects our perceptions, and influences our relations both with other beings and with non-living objects [9]. It has the ability to generate a certain aesthetic ambiance [8]. Even though it is not yet well-defined at which level surface color enables object detection, there was a consensus in researches by Oliva & Schyns (2000) and Rossion & Pourtois (2004), that colored objects are decipherable quicker than equivalent non-colored versions [10]. To attest that notion, in this research we did a survey on semiotic to 150 people, both man and woman aged 18-65, to see their perception on these three images below. The images consist of Hearsey’s visualization in greyscale version (Figure 5a); Hearsey’s original (Figure 5b), and another one in an altered color (Figure 5c).
To maintain the objectivity, we did not inform our respondents that the survey topic was in fact related to the fire in Australia. We asked our respondent to write the first thing that came to their mind after seeing each image. The first image that was presented to the respondent was the greyscale version of the image. 50% of the respondent correctly recognized the image as Australia, 36% identified it as general island/map, and 11% have various other answers. Interestingly, while only sat at tiny percentage of 3%, five people accurately interpreted the image as burning Australia. The second image was the original Hearsey’s visualization. In his creation, Hearsey, understandably used the analogous colors of red, red-orange, and orange; as these triad arguably the best representative of the fire element. Similar in proportion with the first image, half of the respondent recognized the image as Australia continent on fire. Another 38% identify the fiery element but they did not mention the word Australia. The remaining answer did not mention things related to fire/burning. If we compare the first and the second image, the number of respondent soared from 3% to 88% in identifying the fire/burning element by the utilization of red family shades, which is widely known as the signifier for danger. The greyscale version of Hearsey’s image factually lost its contrast and correspondently its clear-cut ability to deliver message regarding the fire. The third image shows the altered-color version, with the red changed to its complementary color, green. In this version, although the color aspect has been reappearing, but it is now communicating a completely different idea. Over 65% of the respondent agreed that in this image Australia is no longer besieged by fire, instead the continent seems to be reclaimed by forest vegetation. 7% thought of something negative, since to them green is semiotically associated with illness/virus. 25% of the answers did not refer to greeneries (this includes answers such as “I don’t know” or “not sure”). Nonetheless, two out of 150 respondents still identified the last image as bushfire image. All things considered; this experiment helps to confirm that it is indeed the use of color that makes Hearsey’s visualization successful in delivering its message. However, color alone was not the reason behind its viral frenzy, since many other similar maps (i.e.: NASA map, MyFireWatch map) also use the same approach. One can argue that the hotspots in Figure 3 are more frequent than Hearsey’s visualization, yet it did not go viral and/or causing any havoc.

3.3. The truth in photographic data visualization
The striking difference between Hearsey’s and both NASA’s FIRM – MyFireWatch visualization lies in the form of their artistic approach. As we can see in figure 3 and 4, the visualizations were meant to be functional, as precise as the satellite could tell, and without any emotional nuance. Opposite to that, in the making of his version of visualization, Hearsey employed his intuitive vision, putting towering mountains, jagged edges, playing with the colors, making the image looks as real as photograph; although at the same time people with trained eyes (and sufficient knowledge on Australia geography) will directly detect its discrepancies with the real land structure of Australia.

As we are now living in a world full of filtered images, we are faced with philosophical question; do we still believe in the faithfulness of a photograph? Truthfully, all visuals are manipulated to a certain extent. The genuine power of photography arises when distorted reality is presented as existing
and is accepted to be seen as such [11]. Another reason for Hearsey’s visualization to be perceived as real, was also because it was presented amongst so many articles with various photographs regarding the fire – photos of burnt forest, tired firemen, helpless kangaroos and injured koalas. These were the visuals that come out when we search the news on Australia fire.

4. The role of internet and social media in public’s information

Current research indicates that most of people’s knowledge and awareness on social issues that are essentially foreign for them derives not from personal experience, but from the assemble of diverse media, both conventional and online [12]. However, in the last decade, the Internet has fully-fledged as the main source of public’s news and information, to the extent where it has become an integral part of their live [6]. Take for example, how would people know that Australia’s endemic vegetation, eucalyptus trees actually played a role in spreading the fire – since they have dry barks that easily sheds, and when this fire-sensitive bark catches fire, it will fast enflaming others? The answer is, they know it from the Internet. And with this ‘new’ Internet materials, people can create more and more content for their social media accounts. Online publishing tools also assists people in building their own blogs and sites. In 2019, the worldwide number of active social media network is approximately 2.95 billion, and this number is predicted to upsurge to 3.43 billion by 2023 [13].

Social media have the ability to facilitate their user to digitally interact and correspond, sharing content one another. These key features allow any users to create media hypes – a power which back then were the domain of news media [14]. However, with the enormous influx of data available on the Internet, people need to curate the things that they want to share and endorse. Here is where the new title is suddenly being conceived: social media influencer. The path to be a successful influencer is varied. Some were working hard using methodical strategies; some were becoming one purely by stroke of luck – but anyone, provided that they have interesting content on their social media accounts, have the possibility to be an influencer. According to the Merriam-Webster online dictionary, influencer is generally defined as ‘a person who inspires or guides the actions of others.’ A more specific definition, ‘person who is able to generate interest in something (such as a consumer product) by posting about it on social media.’ Most of the times, celebrities are inevitably becoming influencer, since whatever things that they post on their social media, will be quickly seen and talked about by their huge number of followers.

As the news about the Australia fires bombarded the internet, Hearsey made his visualization of the topic, simply due to its relevancy with him being resided in Australia. On the 5th of January 2020, he originally posted his visualization on his Facebook account, which followed by fairly small number of 200 or so people, and Instagram account with around 1000 followers. Facebook and WhatsApp (also owned by Facebook) are considered as platforms open to everyone in a more democratic setting [15]. Facebook and Twitter are regarded as the most important social media platform for news in terms of engagement and referrals. While Facebook is perceived as a place for socializing and having fun; on the contrary more than 60% of Twitter users use the platform for getting the latest news [14]. There is a notion that Twitter is a platform for the educated people, since in this platform people are expected to be normative and politically correct. Unbeknownst to Hearsey, the day after his original post got published, the multitalented Barbadian singer, songwriter, actress, fashion icon and businesswoman, Rihanna, reposted his visualization on her Twitter account. The image went viral within overnight. Having more than 95 million Twitter followers, Rihanna’s post certainly contributed in making Hearsey’s visualization an instant viral.

4.1. Filtering interest: the use of hashtag on social media

In her Twitter repost, Rihanna only mention one word; “devastating” followed by a single hashtag #Australia, without any further explanation. A hashtag is a manner of metadata or label tag largely used on social networking websites and microblogging. It helps users to filter content based on the theme. Hashtags are generated by incorporating the hash character (#) ahead of a word or phrase without any space [16]. Plainly put, just from Rihanna’s tweet alone, there were 95 million people
who potentially saw this visualization without a proper information. This tweet works like a multilevel marketing, it can be shared/retweet, so that the message can be passed on further and further.

There are two types on infographic based on its content; firstly, Infographic event in conjunction with specific news event, and secondly is the opposite of it: standalone infographic [4]. As it has been previously stated on the chapter two, Hearsey encouraged people to see his work as an art piece. There is dualism here. Obviously, it is a normal thing for an artwork not to have thorough information as complement, for its audience are expected to appreciate the work as it is, formatively and/or imaginatively. However, since the timing of the posting, this visualization without a proper caption certainly has the potential to mislead its viewer. For most people, visual sensory is particularly strong in picking up presumed connection between perception and physical truth – when we “see” something, our brain interprets it as “true”, while in reality there is an massive gap between the big data provided by the outside world and our strictly limited capability to process them [17]. It is valid for Hearsey to create an artistic rendition of public data according to his flair, which includes exaggerated mountains and rough landscape – a view that supposedly very different from the satellite images of Australia. Nevertheless, for people who do not have sufficient knowledge on Australian topography, this visualization can be understood as a realistic photograph. And this different perspective is a slippery demarcation of true and false news.

4.2. False news on social media

While it is true that people have freedom to post anything on their social media, in reality some people might not like/agree to those posts and can report them to the social media authority (as in Facebook, Instagram, Twitter, etc.). This experience happened on Hearsey’s visualization, as it was also stated on his Instagram caption where he used the term “Zucc’d.” We live in ever-changing internet culture, where new terms are constantly being constructed. “Zucc” or “zucced” is a slang that is used to describe the takedown of internet content for suspected terms of service violations [18]. Facebook uses third party fact checkers. Once Hearsey posted his visualization to public, anyone can repost them as well as adding their own caption for the post. It happened that some people unauthorizedly reposted Hearsey’s visualization with the incorrect caption of “This is a NASA photograph.” This post got fact checked and flagged as ‘false news’. It inevitably led to both Hearsey’s Facebook and Instagram posting being investigated as well. After further verification, Snopes, the independent fact checker website has confirmed that in Hearsey’s case, it is the mislabeled variations as being the concern, and therefore, the original posting has been then verified by then.

5. Conclusion

Infographics and data visualization have gained its popularity for quite some time. Their ability to tell stories based on data will certainly continue to grow, although their formats will probably advance into novel kinds of media. Infographic and data visualization are one of the best mediums to communicate and share information, especially in today’s digital era. While Anthony Hearsey’s visualization of Australia fire might be hyperbolic, it did get the job done in delivering the message on how horrific the situation was during the period. It needs to be once again emphasized, that despite its realistic façade, Hearsey’s visualization is not a photograph. What makes his version standout from another data visualization in the same topic was its lifelike rendering, which succeed in stirring people’s emotion, and in turns some people believed it as reality. In this internet culture, people are fast to click the share button without proper investigations. Reflecting from Hearsey’s episode, it is our self-obligation to be responsible towards each and every news/pictures/memes that we share on social media. We need to be fully aware that the volume of data we have to comprehend and filter through will continue to grow. Hence, we need to be ready in preventing ourselves from the sharing of any reality distortions.
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