THE RISE OF SOCIAL MEDIA LEAVING ITS TRACE ON NATIONAL PARKS

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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National parks around the United States saw 327,516,619 recreation visits in 2019 (“Visitation”, 2020). All of these visitors experienced beautiful views from the valleys in Yosemite and geysers at Yellowstone to the man-made walkways and visitors centers throughout the 419 parks (“Visitation”, 2020). A large percentage of these visitors are snapping photos and posting them to social media. The tagged photos on social media are leading more people to visit the national parks which causes an increase in foot traffic in some fragile environments. Although social media connects virtual visitors and the National Park Service (NPS) to a wider audience, location services are causing detrimental overcrowding and negative effects on the environment. Research into this STS topic focuses on the effects of social media on nature and national parks. The analysis will map out the current relationship between the various stakeholders involved using Carlson’s Technology and Social Relationships model as adapted from Pinch and Bijker’s Social Construction of Technology (SCOT) framework (1984). The research explores how parks and visitors can manage the negative impacts from increased visitation on the environment with the positive impacts of diversitfying the visitors and collecting visitor data using social media. By creating a device to charge electronics while in remote places without electricity through the technical aspect of the project, travelers will increase their use of electronics such as cell phones which may result in more photos and therefore more possible tagging on social media. As result of this link between charging cell phones and the use of social media, the technical topic and the Science, Technology and Society (STS) topic are tightly coupled.

As hiking trips and recreational park visits go on, visitors will need to charge their mobile devices to stay connected to others, use digital maps, and capture photos. Many charging products are currently on the market targeted toward outdoor enthusiasts. A popular design is a

flashlight that requires shaking to cause a magnet to pass through a coil to generate power (Martindell, n.d.). These designs incorporate Faraday's Law where the moving magnet in the coil of wire will induce a voltage in the system (Lucas, 2016). The design of the technical project will incorporate this magnet-coil system but in a different application. The product will specifically be using human movement through arm and leg oscillations while walking and hiking to recharge cell phones when no other form of electricity is available. Though the technical project is helping hikers charge their devices, the use of technology may be harmful for the environment.

SOCIAL MEDIAS INTERACTION WITH THE ENVIRONMENT

Staring out across Horseshoe Bend, a canyon off the Colorado River, visitors pull out their phones and start snapping photos. Who would not? And then they check-in via Facebook to the visitors center, tweet about a funny tourist interaction, and post the best photo of the day on Instagram with the location tagged.

The Bend has seen an influx of visitors over the past few years, increasing from 1,000 people a year to 4,000 a day from 2012 to 2017 (Knepper, 2017). And with social media usage on the rise in 2017 with 2.8 billion users, a 22% increase from 2016, this change led to some protest of the use of tagging locations on social media (Hutchinson, 2017). Platforms such as Instagram, Facebook and Flickr are flooded with beautiful images of natural wonders around the world. In a survey by Expedia, 30% of the participants said that social media influenced where they were going to book their trip (as cited in Boué, 2019). The added trip inspiration from these platforms is straining the national park system. In response to the increase in visitors, Horeseshoe Bend added new amenities to support the tourist attraction such as more parking and platforms around the canyon. The cause and effect of overcrowding has been seen throughout multiple national parks with an increase in visitation being connected to the increased use of photo sharing platforms.

To balance more people visiting the parks, the National Park Service (NPS) encourages following them on the many platforms such as Instagram and to follow along on virtual tours and infographics. In addition, the NPS gathers visitation statistics from social media. The statistics act as a way to track visitation to be able to support the number of visitors they may see during a season (Freimund & Miller, 2017). Although social media connects NPS to a wider audience and

provides more visitation data, location services are causing detrimental overcrowding and negative effects on the delicate environments surrounding the national parks.

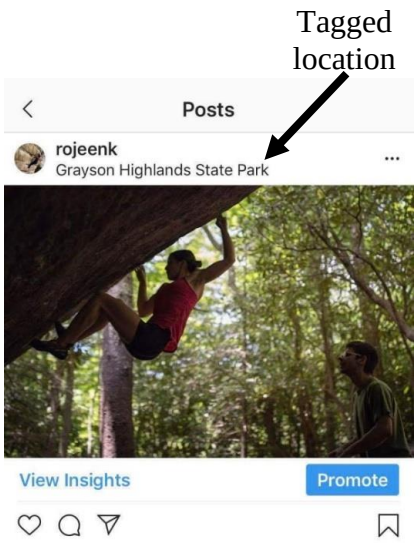

Figure 1 : Instagram Post with a Tagged Location: This post shows a geotag at Grayson Highlands State Park (Kamali, 2019).

#TAGGING ON SOCIAL MEDIA: GEOTAGS AND HASHTAGS

A geotag is "an electronic tag that assigns a geographical location to a photograph or video, a posting on a social media website, etc" ("Geotag", n.d.). It uses satellite positioning and the global positioning system (GPS) on phones to link photos on social media to a specific location. Figure 1 provides an example of tagging a location on Instagram. After tagging a location, viewers can click on the link and look at other photos from the same place or look up the location and find photos tagged under the same name such as "Grayson Highlands State Park." The left screenshot in Figure 2 shows the page for the tagged location that provides an interactive google map, both the top and recent photos from the location, and an option to "View Information." Tapping the blue button leads to the right

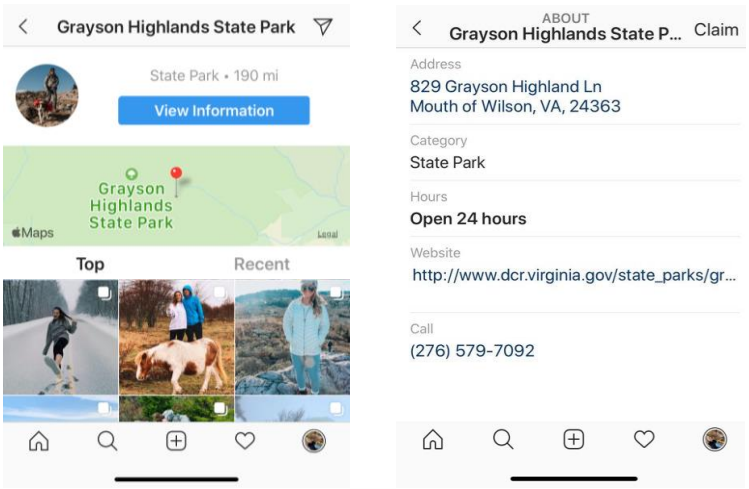

Figure 2: Grayson Highlands State Park Instagram Location Page: These pages show how much inormation is provided by Instagram (Kamali, 2020).

screenshoot in Figure 2 which contains even more information such as the address, website, and phone number.

In a study among Instagrammers, "social posts with a geotag received 79% more engagement than posts without" (Boué, 2019, para. 3). Because of influence of geotagging on other social media users, the Jackson Hole Travel and Tourism Board asked visitors to stop geotagging their posts to protect Wyoming and its natural forests and remote lakes (Holson, 2018).

However, the likes, comments, and re-posts can also shed light and bring attention to certain issues. Written for The Washington Post in 2020, "*Lions Are Starving to Death in A Sudan Park. A Worldwide Campaign Is Underway to Save Them"* describes a movement to help malnourished lions in Al-Qurieshi Park in the capital of Sudan (Thebault, 2020). The issue came into the public eye after a social media campaign was launched by Sudanese activists. They shared photos of the frail lions and "they've attracted an audience of thousands, spreading across social media feeds around the world and prompting an online campaign that has adopted the hashtag #SudanAnimalRescue" (Thebault, 2020, para. 2). Other hashtags such as #SudanAnimalRescue has 427 associated posts and #savesudanslions has 480 and the images associated with them have gone viral. Through the power of social media, money is being raised for these animals to help better their conditions. However, Osman Saliah, an advocate, is cautious about fraud and is hoping create an organized system for collecting donations over social media (Thebault, 2020). Though in this scenario, the spread of information over social media is helpful, there are still some insecurities.

TAGGED LOCATIONS ARE HARMFUL TO NATIONAL PARKS

By overcrowding the national parks, there has been an increased pressure on the fragile environments surrounding them. Hegyi (2019) seems to blame the "selfie tourist" for some of the overcrowding and Garcia-Navarro (2017) says the issue stems from visitors who neglect their responsibilities. The Conundrum Hot Springs in Colorado had to get shut down because visitors "ran out of places to go to the bathroom…they [park rangers] literally had to shovel up everyone's waste and pack it out for them" (Garcia-Navarro, 2017, para. 10). This disregard for nature and personal responsibility takes a toll on the surrounding environment. Tenkanen et al. (2017) emphasize an increase in tourists' number may result in a higher disturbance on biodiversity and pressure on the environment, challenging the sustainability of tourism. However, if these tourists manage their behavior and practice leaving no trace, it benefits the NPS in other ways.

… AS WELL AS HELPFUL TO THE NPS

Technology such as social media allows users to connect and share content over a varity of platforms from across the world. These networks provide a greater accessibility of information and the park service is trying to use that informtion for their advantage through virtual visitors and data collection.

Currently, the NPS instagram page has 2.4 million followers and contains over a thousand photos of the 419 parks and wildlife around the United States (National Park Service, n.d.). The government organization connects their virtual visitors to the parks through these platforms to promote civic engagement and public involvement to a wider audience (Freimund & Miller, 2017). Other groups such as 59in59 are also taking advantage of the technology. Darius Nabors, University of Virginia graduate and brain behind 59in59, takes students on virtual tours

around 59 national parks that he has personally photographed using 360 degree images (Nabors, n.d.). Social media is a great communication tool and the NPS and other groups are using it to digitally connect with younger audiences to hopefully diversify the population of users.

As more people get involved with the NPS on social media, the park service can gather the location data and use it to manage the parks. Published in December of 2017, the scientific article *"Instagram, Flickr, Or Twitter: Assessing the Usability of Social Media Data for Visitor Monitoring in Protected Areas"* describes how social media data is used to monitor activity in different environments (Tenkanen et al., 2017). The researchers Tenkanen et al. (2017) compared data from Instagram, Flickr, and Twitter to official visitor counts and park popularity. Although social media visitation data matched well with official visitor counts, the researchers concluded that parks should use social media data with caution (Tenkanen et al., 2017).

Gathering visitation data is crucial to managing national parks and its surrounding environment. Visitor monitoring can help to allocate resources, target infrastructure development, and restrict access to areas where human pressure is unsustainable, hence minimizing the impact on the biodiversity" (Tenkanen et al., 2017, p.1). In Tenkanen's study, visitation data was collected through the social media platforms Instagram, Flickr, and Twitter. Their results showed that Instagram had the highest correlation representing the monthly visitor patterns and "that social media data has a high potential to be used as a data source for monitoring the number of visitors in natural areas, both for gaining information on the park popularity and on temporal visitation patterns" (Tenkanen et al., 2017, p.4). The Tenkanen et al. (2017) research showed the crowdsourced data varied greatly in quality and is relative to the popularity of the network. The results were more accurate when the data sources were used

together and the conclusions are relative to the quantity of social media data that was uploaded (Tenkanen et al., 2017).

RELEVENCY OF THE PROBLEM

Though the topic of a geotag may initially seem harmless, the graphic above shows the complexity of the technology. The technology and social relationships model by W. B. Carlson, an example of the Social Construction of Technology (SCOT), accurately represents the current role of active social media users. The end user directly relates to influencers, NPS, social media platforms, and other users as seen in Figure 3 and these groups are directly affected by the actions of the social media user. Being an "influencer" or someone with a large social media following and credibility has become a career as "over the last five years, influencer marketing has grown into a multibillion-dollar industry" (Martinaeu, 2019, para. 24). The user can interact with influener posts with likes, comments, and tags and in return the influencers have more profile visits and interactions to boost their numbers. Similarly, by interacting with other social media users, the end user receives more followers and there is increased engagement on both ends. The NPS relates to the social media user by creating interactive, informative posts about national parks, promoting them to a larger audience. And the social media user can connect to the NPS by incorporating hashtags into posts or tagging @nationalparkservice. All these users engage in social media and are interconnected by the actions of the end social media

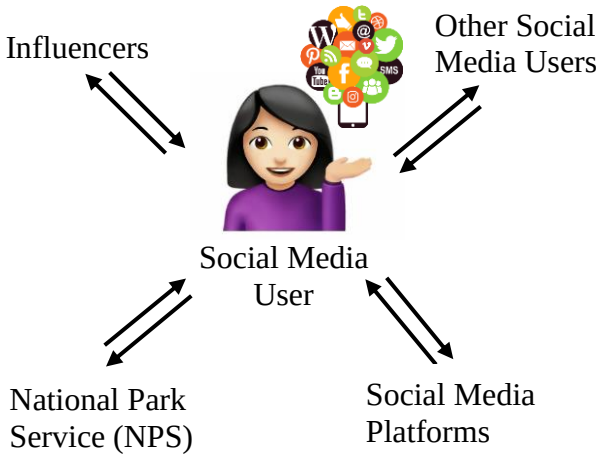

Figure 3: Media and Social Relationships: The end social media user employs technology and the individuals on either side can be affected by the end user engaging in social media location services (Adopted by R. Kamali from W. B. Carlson, 2019).

user. Social media platforms create a space for the end user to develop these social interactions and foster a more connected community through technology. However, this model only incorporates individual actions in relation to the end social media user. All of the stakeholders involved need to share information and be informed of all aspects of the actions of influencers, social media users, platforms and the NPS to fully be able manage the negative impacts from increased visitation on the environment with the positive impacts of diversitfying the visitors and collecting visitor data using social media.

FUTURE OF LOCATION TAGGING

As social media becomes a larger part of daily life, the world continues to shift around it. In the wake of the Novel Coronavirus epidemic in 2020, the National Park Service urged users to stop visiting the natural wonders around the United States in person ("NPS Public Health Update", 2020). Many people began social distancing by visiting national parks and engaging in more outdoor activities. Instead, the park service encouraged having virtual tours on their social media sites such as Instagram to practice social distancing ("NPS Public Health Update", 2020).

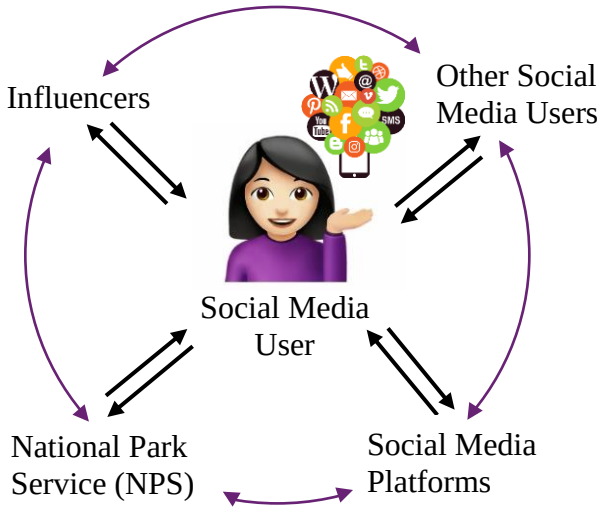

Figure 4: Modified Media and Social Relationships: All of the groups are connected to the end social media user as well as each other (Adopted by R. Kamali from W. B. Carlson, 2020).

Social distancing is an effort to prevent the spread of the virus by staying home and limiting interactions with other people. The response of the NPS to the spreading virus illustrates the interconnected system between social media, all users, and the park system. Figure 4 modifies the previous example of the technology and social relationships model to show more

connections between each of the groups. The NPS can reach out to influencers to help promote ideas to a larger audience, platforms can share ideas of Leave No Trace, the NPS will gather satistics over social meadia platforms, and other users can come together and encourage each other to visit parks virtually through shared photos and content during times like the Coronavirus Epidemic.

The presence of new platforms and technology create new responsibilites for visitors. Balancing the negative impacts from increased visitation on the environment with the positive impacts of diversifying the visitors and collecting visitor data using social media is a large responsibility held by both the park service and visitors. Ideally, increased visitation will help promote national parks and simulate conversation about preserving the environment as well as bring more underrepresented groups to enjoy national parks; however, the negative effects on the surrounding environment should not be neglected. Social media users and national park visitors have to take accountability for the way they share on social media and venture into national parks. As visitors pose and snap photos at Horseshoe Bend, think past the hashtags and likes and remember to advocate for public lands.

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