

The Holy Trail: Rethinking 'Value' in Google's Ubiquitous Mapping Project

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Abstract

This research explores issues of convergence, value and labour through a case study of the Google 'Trekker' programme: a crowdsourcing initiative in which volunteers carry camera-outfitted 'trekker packs' to capture remote or hard to reach landscape imagery for Google Maps. We theorise how 'ubiquitous mapping' redefines traditional spatial boundaries, and how these new forms of convergence redefine notions of value around both labour and cultural space. Simultaneously physical and virtual, manual and digital, material and immaterial, Google Trekkers voluntarily produce immaterial goods via manual processes, problematising existing critiques around the social relations of production. From this context, we discuss how Google Trekker expands the company's commercial value at the expense of consumer and citizen privacy, while retaining control over the construction and meaning of space.

Introduction

This article explores issues of mapping, labour and the valorisation of space as they function in service of expanding Google's digital empire through a case study of the Google 'Trekker' programme: a crowdsourcing initiative designed to expand the ubiquity of Google Maps through the capture of imagery of hard-to-reach landscapes. Volunteers carry a 42.5lb/19kg 'trekker pack' outfitted with 15 5-megapixel cameras that, once activated, take a photo every 2.5 seconds to record 360 degree panoramic views of these remote or unique places otherwise inaccessible to Google's vehicle-based capturing equipment such as its Street View car, which captures footage from a camera attached to the top of a moving vehicle. The data and imagery collected by 'Trekkers' are then given to Google for integration into Google Maps' Street View function.¹

Drawing from Marxian approaches to digital labour (e.g., Fuchs 2014, Terranova 2000) and space (e.g., Farman 2010, 2014, Lefebvre 1991), we examine the ways in which the Trekker project redefines traditional boundaries between the material and immaterial, physical and digital, public and private. We consider how Google relies upon digital

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technologies to shape the social construction of space and place to reinforce the logic of the market. We then unpack the ways in which the Trekker programme problematises existing critiques concerning 'digital labour'. Much has been written about the unpaid digital labour that makes up an increasingly substantial part of the digital media/information economy. We aim to add to those debates by examining the *physical* elements of unpaid digital labour; specifically, we highlight the way physical demands and related assumptions about class-based modes of production are largely absent from conversations concerning informational work, particularly unpaid digital labour. We argue that Google Trekker is bound to a convergent form of 'physical digital labour' in which Google Trekkers voluntarily produce digital content via manual processes that make up an increasingly substantial part of the digital media/information economy and, in the process, redefine notions of value around both labour and cultural space.

Theories of Space/Maps

We begin by challenging the common sense assumption that maps are objective representations of reality. In an expansion on Hegel and Marx and Engel's conceptualisation of space, Lefebvre argues that space is not a product or thing – i.e., something that exists *a priori*; to assume otherwise is to assume that space is a given, rather than produced and practised. Instead, space is social – a 'set of relations between things (objects and products)' (1991, 83). The historical production of maps demonstrates this quite clearly. Maps are designed to serve a specific function, e.g., to resolve spatial problems or to orient users in specific ways or for specific purposes. They reflect a specific aspect of 'reality' while erasing or misrepresenting others. The inherent bias of a map is therefore a product of its functionality. A cartographer makes decisions about what details to include, exclude, falsify or exaggerate in order to make the map effective in communicating space for the user. Thus a map cannot be generalised if it is at the same time meant to be useful. As maps represent space in particular ways to serve particular ends, we must recognise that these ends are often politically and ideologically motivated (Farman 2010, 872). Representations of space and place thus construct and stabilise geographical knowledge, which has always been closely associated with power (Graham, 2014, Pickles 2004).

A consideration of cartographic labour raises important questions pertaining to how space is *valorised* in its production and representation. As Sarah Sharma asks in her discussion of the relationship between mobile computing culture and space, 'Whose labor and time is re-orchestrated to make any of the "new things" happen? What routes and paths are devalued and what regimes of dependency are created in these new technological practices?' (2013, 67). A discussion about the production of space and place in relation to mapmaking, in other words, requires that we ask whose labour goes into this production of space.

One only needs to draw upon the history of cartography to see how the production of maps has been politically and ideologically motivated, particularly in their design to serve

colonial expansion and the interests of imperial powers. As Edney writes in *Mapping an Empire*, imperialism and mapmaking are interrelated concepts in that both are 'fundamentally concerned with territory and knowledge' (1997, 1). He further elaborates that the map 'came to define the empire itself, to give it territorial integrity and its basic existence. The empire exists because it can be mapped; the meaning of empire is inscribed into each map' (Edney 1997, 2; also cited in Farman 2010, 870).

Citing the Mercator Projection map, Farman (2010) notes how the map functioned not just for the purposes of nautical navigation but also to reinforce Europe's colonial domination by placing the continent as the central landmass from which all nautical activity radiated outward. The map presented a flattened rendition of the earth, distorting the relative size of land masses closest to the Earth's poles and equator. Places like Greenland and Europe, therefore, were stretched to appear much larger than those closer to the equator, such as Africa and South America. The Mercator Projection map symbolically reinforced colonial powers' advantage over smaller equatorial regions. A more recent example that critiques the presumed neutrality of cartographic conventions naturalised in Eurocentric maps like Mercator is the 1979 *McArthur's Universal Corrective Map of the World*. In this map, the southern and northern hemispheres are reversed to present an 'upside down' view of the world, which intends to challenge Anglo norms of spatial orientation as socially constructed phenomena.

As these two examples illustrate, maps are, therefore, 'unstable signifiers, heavily imbued with the cultural perspectives of the society that created them' (Farman 2010, 874); they are not merely cultural representations of space but representations of the cultures responsible for their production. To think of maps as an 'objective, often scientifically produced, index of reality' (Farman 2014, 86) thus obfuscates the reality of their production, the contests and cultural spaces they valorise, and who gets a say in what spaces are ultimately produced. This is particularly true for computerised digital systems, a reliance on which Robin Mansell argues

impedes access by online participants to – or at least masks – the values and motivations of those who are designing the system. When these developments are seen as the outcomes of a complex self-organizing system, the assumption is that this is simply the result of an optimizing evolutionary (a 'natural selection' of the fittest) process. (2012, 116)

Mansell's point underscores the utopian promise of 'neogeography', the creation of spatial data and personalized mapping by non-professionals (Graham 2010). Enabled by the interactive online technologies associated with 'web 2.0', neogeography aims to challenge many of these existing knowledge and value regimes (Graham 2010). User-driven digital mapping opens up new possibilities for representing space, as 'everyday' people can augment the material world with digital content to construct new geographies of knowledge with locally relevant information about the world, particularly for under-represented and disadvantaged places. In practice, however, critical geographers have

found that global digital divides continue to cast uneven ‘data shadows’ over the world’s economic peripheries (Graham 2010, 2014). Graham’s empirical documentation of locally-relevant and locally-produced content indexed by Google Maps, Wikipedia and other key internet platforms of information demonstrates the continued dominance of North American and Western Europe in geographical knowledge production. Not only is there comparatively more geographical information written about the Global North; linguistic barriers also render user-generated information inaccessible to many people. Beyond accessibility, the ‘digital division of labour’ is also significantly skewed; Africa, Asia and South America, for instance, report significantly fewer content producers per capita than Western nations, suggesting inequalities of local voice and participation. These uneven data shadows and divisions of labour matter because ‘[a] lot of people and places are both literally and figuratively left off the map’ (Graham 2014, 114). These absences ‘influence what we know and what we can know about the world’ as the voice and representation of some people and places remain visible and more dominant than others (Graham 2014, 114).

Despite the widespread levelling of internet access and digital mapping tools, long-standing global patterns of visibility and representation remain. These gaps will not necessarily be closed with more local production, either, if we consider the way *visibility* of place is now ‘automatically produced’ through the *invisible* processes of code (Zook and Graham 2007). The seemingly objective and natural process of ranked internet search results is belied by the invisible algorithmic ‘black box’ that relies on linkages and code to ‘fix’ virtual geographies and representations of space (Graham 2010). By determining how information is delivered to internet users, search engines like Google effectively control access to content. It decides what information is included or excluded from maps, how that information is ranked, and how individuals interact, participate with or modify that information (Zook and Graham 2007, 1332). Through the automated processes of code, proprietary mapping platforms like Google Maps have a great deal of control over what spaces and places are made visible, enabling the rise and reproduction of ‘distinct forms of social, political, and economic power’ (1328).

As ‘virtual palimpsests’ of place (Graham 2010), neogeography intensifies mapping’s spatial (as opposed to temporal) bias. For Harold Innis, space-biased media that facilitate the communication of information over vast distances tend to favour the centralisation of power within societies. They also have a higher information capacity than time-biased media, which tend to transcend time but also favour decentralised social structures and provide people with an ‘artificially extended and *verifiable* memory’ (Innis 2007, 30, emphasis added). Finally, space-biased media also make it easier to copy (and thus further disseminate) information, which has the tendency to transform information into a commodity. Information becomes ‘mechanized’, i.e., stored, processed, and disseminated via a complex system of technologies and tools (Innis 1991 (1951), 190). Because space-biased media favour centralised structures, a select few are able to control these informational tools, resulting in what Innis (2007) refers to as a ‘monopoly of knowledge’ which represents significant power. Those with authority over information

tools have the ability to shape worldviews in the sense that they are in a position to define what representations of reality are legitimate.

Thus, as Sharma points out, 'Civilizations that emphasise space over time tend to be imperial powers, involved in the conquering of space at the expense of the maintenance of culture over time ... by all such determinations, global capital depends on spatially biased cultures' (cited by Farman 2014, 84). This dynamic can be seen in the Google Trekker project. In its current form, the programme calls upon tourism boards, non-profits, universities, research organisations or other third parties with access to unique 'off the grid' spaces and places to 'help map the world' ('Be the Next Trekker' 2015). Locations that have been recorded and integrated into Google Maps so far include sites like Mount Everest, Grand Canyon, the Galapagos Islands and Japan's Mount Fuji.² Following suit, the New South Wales (NSW) National Parks and Wildlife Service partnered with Trekker to record a number of hiking trails and bushwalking routes for prospective tourists to explore, plan and learn about a particular area from the comfort of their own homes before arriving in Australia ('Google Street View Trekker in NSW' 2014). The Google Trekker programme has more recently expanded to capturing the interiors and exteriors of popular monuments and cultural sites around the world as well, such as the Eiffel Tower and the Burj Khalifa.

These partnerships between volunteer enthusiasts, tourist boards and other organisations highlight new ways that Google Trekker contributes to the transformation of nature and space into sites of consumption. Rather than being appreciated simply for their beauty, history or environmental uniqueness, these sites are instead presented as *destinations* to be experienced through (revenue generating) tourism – first virtually, then physically. And importantly, this construction depends upon the physical digital labour of volunteers, or those subsidised by tourism boards and councils, who produce an end-product on behalf of Google that they do not own. In these examples, Google Trekker presents natural spaces in a particular manner that asserts and even naturalises the capitalist ideologies of both Google and tourist organisations.

Building a Data Empire

Google Trekker is part of the larger Google Maps project, which seems intent on providing a panoramic map of every interior and exterior space across the globe. This includes 'Business View', which provides virtual tours of small and medium-sized businesses (e.g., restaurants, offices, fitness centres) taken by a Google photographer and then linked to that business' Google Places profile and embedded into their own website. Google's 'Indoor Maps' programme invites firms to construct building directories that offer interior location and multi-level floor plan information for spaces like malls, airports and concert halls. Large venues like universities and sports stadiums are also invited for Google Street View mapping if not by the Trekker pack then by trolley, trike, car or snowmobile as dependent on accessibility levels. These maps are integrated with Google's other commercial (and data-gathering) features including consumer reviews,

Google+, Google Flights (to reach destinations), and Google maps directions (which track user locations and habits, particularly via mobile devices).

As an integrated platform, Google effectively merges map, image and physical movement largely for the purposes of promoting consumption. Google's Street View and Trekker projects not only rely upon presumed neutrality of computer-generated maps to mask this commercial orientation, but also upon the immediacy and presumed objectiveness of aerial and panoramic photographs. These qualities serve to obscure many of the underlying issues relating to the social construction of space. While people are increasingly aware of the ease with which digital photos can be manipulated, the combination of cartography, photography and code here (and, perhaps, 'trust' in Google) reinforces the idea that Google is presenting us space 'as it is', which masks this ideological construction. Google's proprietary algorithms index and rank search criteria in a way that is highly constructed but appears 'natural'. This process reinforces the view that digital maps and the internet itself are objective representations of space (Zook and Graham 2007).

Theorised in terms of Hardt and Negri's rearticulation of 'empire', Google serves as a primary example of 'how corporations that control the flows of information and the infrastructure behind those flows now wield powerful global control' (Farman 2010, 877). Though the firm's global, deterritorialised form is fundamentally different from traditional notions of imperial power, its dominance over the digital economy is not merely in its near monopoly over search engines (and thus access to information-seeking) but – via Maps – over the production, representation and valuation of space. The Trekker programme enhances the value of Google's Street View maps and enables the firm to compete more aggressively in the map data market. Early industry reports projected the Trekker programme would help the company reclaim some of the 23 million users it lost to Apple Maps since 2012, while remaining competitive against Bing's 'Streetside' application. Of course, Trekker also considerably extends Google's commercial value by driving traffic—and thus ad revenue—via the location services it also offers (Arthur 2013). Mapping data holds extensive commercial value for third parties in the form of targeted marketing or other forms of ubiquitous surveillance, often at the expense of user privacy (Andrejevic 2007).

A discussion about the production of space and place in relation to mapmaking requires that we not only 'interrogate whose space we are talking about', but also whose labour goes into this production of space (Farman 2014, 85). In this case, Google's attempt to relate space and global capital (i.e., its spatial conquest) depends upon the participation of volunteer 'digital labourers;' that is, users – and in this case, public institutions – to help generate the content that enables the firm to establish a 'monopoly of knowledge'.

Digital Labour

Google Trekker's user-generated production of non-tangible digital content is a form of value-producing digital labour. Programmes like Trekker function on the democratic promise of participatory digital media in that amateurs and professionals alike are invited to circumvent corporate control of knowledge and actively participate in content creation. Terms like 'produsage' (Bruns 2005) or 'prosumption' (Ritzer, Dean, and Jurgenson 2012; Tapscott and Williams 2008) point to the way that the traditional distinctions between 'producers', 'consumers' and 'users' no longer appropriately describe the production and consumption processes or practices in a contemporary digital economy. A growing body of critical scholarship has attended to ways that this seemingly immaterial labour captures Internet users into a set of social relations not unlike those Marx observed from the factory floor. A significant difference, of course, is that the prosumer voluntarily exchanges his or her labour for *immaterial* returns. For example, the free and voluntary labour of producers and prosumers generates immense value for corporate firms as productivity is harnessed towards the ends of capital accumulation, often at the expense of user privacy or commodification (Andrejevic 2013; Hearn 2010). As Ritzer and Jurgenson summarise, 'From the capitalist's point of view ... the only thing better than a low-paid worker is someone (the consumer as prosumer) who does the work for no pay at all' (2010, 26).

This perspective has also been challenged by scholars like Hesmondalgh (2010) and Baym and Burnett (2009), who contest the idea that the appropriation of free, immaterial labour necessarily qualifies as either alienation or exploitation in a Marxian sense. This latter view typically points to the immaterial affordances such productive activities proffer the digital labourer, such as the benefit of experience, exposure, creative agency, empowerment or other non-monetary forms of capital (e.g., social, cultural, human). Moreover, 'free labour' does not universally apply to all acts of digital prosumption as these activities (and the values they generate) are not always the same. As Fast et al. argue, 'Free labor that contributes to the actual manufacturing of a commodity through user-generated content is very different from contributing free labor to value-enhancing activities that might in the long run make a commodity more sellable' (2016, 965).

While critiques to the free/immaterial labour thesis are valid, it is also the case that the value-creation chain for digital and cultural products/services has become significantly more complex. Immaterial assets like knowledge, affective support, branding and flexibility are increasingly important markers of success for organisations *and* individuals (Fast et al. 2016). In many cases, the exchange value derived from user contributions is not immediately realised but rather manifests over time; what might not be conceived as 'labour' in an immediate sense may certainly have served that function later on down the line.

Taking a more traditional Marxist approach, Fuchs (2014) explicates the politics of free labour in the digital economy by borrowing from Marx and Engels' distinction between

work and labour. As differentiated from notions of 'labour', 'digital work' is tied to the creation of a commodity's use-value:

Digital work makes use of the body, mind or machines or a combination of all or some of these elements as an instrument of work in order to organize nature, resources extracted from nature, or culture and human experience, in such a way that digital media are produced and used ... Digital work includes all activities that create use-values that are objectified in digital media technologies, contents and products generated by applying digital media. (Fuchs 2014, 352)

Conversely, 'digital labour' is a form of 'alienated digital work'. By definition, then, digital *labourers* create 'digital media technologies and contents' but do not own or control the means, tools, conditions or results of production. It is thus the state of alienation from one's work that constitutes digital production as labour – alienation from the 'work itself, from instruments and objects of labour and from the products of labour' (Fuchs 2014, 351). Certainly, many people engaging in voluntary digital labour do not recognise or experience their activities as alienating or exploitative. But again, it is also the case that while digital labourers may find pleasure in the process of voluntarily generating content, 'every database becomes a potential source of exchange value' (Fast et al. 2016, 973). As most sites of production retain proprietary rights over user data, even productive activities conducted for 'fun' are ultimately monetised via any number of strategies, including the generation of brand equity, dataveillance and advertising.

Marx long ago noted the division of labour between mental and physical/manual work. Work under communism would overcome such divisions through its generalisation, thus comprising a society of well-rounded, active human beings passionate about their work (as opposed to alienated and subordinated). In similar vein, Fuchs also calls for the demystification of the material/immaterial split around digital labour, arguing that global ICT products and infrastructure are not immaterial but rather bound to a wide range of material forces and varying social relations of production. Describing what he terms the 'international division of digital labour (IDDL)', Fuchs points to the range of work and labour conditions that are largely obfuscated in the celebrations of unalienated work in the network society on one end, and post-material, post-industrial labour critiques on the other (2014, 5). Speaking to Hegel's work on the dialectical, it is such that older forms of production are absorbed by new modes, and continue to exist in relation to the new mode; however, it is also possible that 'relations that resemble earlier modes of organisation are created' (Fuchs 2014, 10). Thus, elimination and preservation of a particular mode of production are simultaneously present as they evolve to different degrees, non-linearly or otherwise.

In the digital economy, productive forces have evolved towards informational, rather than industrial or material forces; however, as Fuchs notes, 'The informational productive forces do not eliminate, but sublimate (*aufheben*) other productive forces ... In

order for informational products to exist, a lot of physical production is needed. This includes agricultural production, mining and industrial production' (2014, 10). Under capitalism, different modes of production (and thus alienation and exploitation) continue to exist: from the slave-like conditions of mineral extraction in Africa to the industrialised labour of ICT manufacturing and assembly in China, to call centre service workers in India, Silicon Valley's software engineers and the unpaid 'produsage' of the digital media user/prosumer. In other words, what we consider to be 'informational goods' (like Google Maps) still require a wide range of labour – manual and digital, material and immaterial – that is objectified in the final commodities (e.g., computers, tablets, smartphones and other networked digital devices) and the infrastructure that sustains them. Google effectively masks the physicality of the Trekker's digital production as it exploits the passions of the volunteers it employs (as well as the labour of those along other steps of the commodity chain). While the Trekker's digital labour might not exemplify the coercion and immiseration of industrial-era relations, there are other steps in the production chain that do (e.g., in the material extraction, sweatshop labour, toxic e-waste disposal and so on). That these latter steps are undertaken by third party contractors as opposed to Google employees themselves does not obfuscate this point. The fact remains that 'a small owner class benefits from the unpaid labour of the masses' (Andrejevic et al. 2014, 1091) by transforming value-producing activities into unrecognizable forms that serve the interests and imperatives of the capitalist class.

Google Trekker and 'Physical Digital Labour'

Unlike other forms of digital production commonly evaluated in the literature (e.g., modding, consumer reviewing, tweeting, blogging and other forms of social networking), the Google Trekker project merges the digital and material in distinct ways. The highly physical nature of production becomes the responsibility of the Trekker participant who must carry (and care for) the Google Trekker backpack through remote environments and/or precarious places and lengthy distances. For example, staff from the Canal and River Trust in London walked over 100 miles in a month in order to record some of the country's most famous waterways (Ensor 2013). Here one can see the convergence of manual or physical labour and digital labour, what we refer to here as 'physical digital labour'; those carrying the Trekker pack are undergoing extensive physical exertion in order to generate digital media and content – the imagery and locative data used to populate Google's Street View maps. The Trekkers' physical labour produces a digital output for which they are not paid, using tools they do not own to produce immaterial commodities which they also do not own or control.

The Trekker Pack's automated photo-taking features, however, free the Trekker from the task of locating a 'perfect' shot.³ While the machine does not necessarily control the worker, the worker is subject to the machine, as the production of images (and ostensibly their consumption) 'instead point toward disembodiment, the dislocation of the subject, and objectivity' (Farman 2010, 875). This automation also serves to obfuscate the

production process and alienate the digital worker, i.e., the Trekker, from the very content they created for Google's proprietary use and ownership.

As cartographic science came to dominate the art of mapmaking, the gap also closed around notions of authorship. Whereas hand-drawn maps were often associated with an individual creator or artist, mass-produced and computer-generated maps (be it those created from satellite and aerial imagery or one of Google's other vehicles for panoramic mapping), according to Farman,

are more commonly associated with the machinery that produces them than the person or organisation capturing or compiling them. This association between machine and product distances maps like Google Earth from a sense of subjectivity and instead emphasises the objective nature of photographic representations of Earth. (2010, 875)

The presumed neutrality of computer-generated maps like Google Street View ostensibly undermines falsified representations or political and ideological motivations because of their aerial, panoramic or multi-dimensional photographic representations of the 'real'. As the labourer works in service of the machine, the production (and consumption) of images obfuscates the manual and digital labour invested in all Google maps.

Space, Maps and Digital Physical Labour

The function of Trekker, we argue, is to expand the consumption of space, be it commercial, experiential or visual consumption, as it also reproduces Google's dominance and visibility in the global market. These Trekker maps – like all maps – are constructed within particular social relations of production and within a particular political economy that reinforces Google's imperial dominance over the production and control of space - processes which are also inextricably tied to the valorisation of space, as well.

Edney's claim about the relationship between mapmaking and imperial power's concern with 'territory and knowledge' plays out in the way Google uses its existing dominance to harness the productive labour of its users in the production of Trekker-view maps. Although the 'physical digital labour' we describe here is integral to the Google Trekker project, it also capitalises upon a local's specialised or intricate knowledge of a particular space or place. The Trekker programme is primarily reserved for non-profit organisations such as research organisations, community trusts, tourism boards and universities – many of which are public and drastically under-funded institutions – that have ready access and intricate 'local' or specialised knowledge of exclusive, remote or unique locations. In other words, the Trekker programme enables the construction of geographical knowledge by granting exclusive spatial production to those with a vested interest in a specific re-presentation of that space (and thus the production of specific knowledges).

One of the first participating Trekker members, for example, was Hawaii's Visitor and Convention Bureau (Strange 2013). Partnerships with tourism boards in particular emphasise the commercial underpinnings of the Google Trekker project. In the case of Google Trekker, even nature or 'works' such as temples and monuments become 'beauty spots', in the words of Lefebvre, where 'ravenous consumption picks over the last remnants of nature and of the past' (1991, 84). Culturally, local tourism boards and non-profits have been incentivised to develop panoramic interiorisations of important or unique cultural sites, making digital replications of global spaces virtually accessible for both commercial and cultural imperatives. Users and public institutions feel like they are a part of something (crowdsourcing the mapping of local or unique places special to them) but in doing so assist in positioning Google as the *de facto* authority on what value we assign to space and thus the world.

Google Trekker's lack of objectivity and its political/ideological motivations becomes a bit more visible when looking at its own Street View world map that outlines the geographic spaces that have thus far been mapped by the Street View programme. That which is deemed 'mappable' (included) becomes just as relevant as that which is not (excluded). Notably, we see that much of the developing world remains unmapped, alongside terrain (Northern Canada, Antarctica) in which little commerce or tourism occurs (i.e., spaces that have little commercial or consumer value). This resonates with the larger Google Maps project that privileges the interior and floor plans of businesses, universities, tourist destinations, malls, airports and other commercial venues: that is, the sites and spaces of consumption. The world's economic core thus literally and figuratively maps onto the world's informational core.

Territorially, Google's allocation of Trekker packs and the other necessary materials of production enables certain firms to reinforce their dominance in the global digital economy; this occurs through the volunteer labour of users/participants, but also in the way it assigns value to some spaces over others as it decides which territories are worthy of mapping at all. For Farman, Google's desire is 'to map out a new territory: the digital empire' (2010, 876). If 'maps have been ... a way for empires to intimately know the territory they have conquered and controlled' (Farman 2010, 876), we might also rethink Google's role in delineating boundaries, defining territories and spatial knowledge and what potential 'regimes of dependency' (Sharma 2013, 67) it constructs in the process.

The Google Trekker project folds public institutions into a public-private partnership model that engages the labour of those institutions in the process; in doing so, it reinforces a wider set of ideological and political economic arrangements resonant with a neoliberal ethos of self-made entrepreneurship. For example, in August 2014, the Tourism Board in Victoria, Australia partnered with Google Trekker to map some of the region's most popular tourist attractions in and around Melbourne, which will include sites as varied as Federation Square, the Melbourne Cricket Ground, the Royal Botanical Gardens, Yarra Valley and the Great Ocean Road (Roper 2014). The public-private partnership is part of the city's 'Play Melbourne' campaign, which followed the previous

year's 'Remote Control Tourists' project, which allowed potential visitors to experience the city in real-time by directing four camera-and-microphone outfitted 'tourists' to various locations they wanted to see - and consume - via Facebook and Twitter requests. The final Remote Control Tourist Google Map of Melbourne made available for public use at the campaign's end now features an online 'interactive city guide' that only partially represents the restaurants, bars, cafes and attractions originally crowdsourced from participants.

It should be noted that Google's spatial conquest has not been met without some resistance from global communities that have refused to cooperate with Google's street mapping initiatives. For example, in 2011 the city of Bangalore, India, shut down Google's attempt to map the city with its Street View car on the grounds of 'security concerns', although Google would eventually convince the Indian government to allow the Trekker programme to photograph the country's cultural monuments (Anwer 2014).

As the relationship with Google folds non-profit and tourist organisations into a public-private partnership, it thus raises questions about the extent to which the imagery becomes a public or private good. Google maintains all rights over images collected. In exchange, the public organisation gains 'exposure' and PR even as they perform the physical digital labour. This form of labour is, as Andrejevic notes, 'free' in dual form: it is 'both unpaid (outside established labor markets) and freely given, endowed with a sense of autonomy' (2009, 416). Google, on the other hand, provides the means of production while retaining the rights to imagery and control over the structure and shape of what information does or does not appear. As such, these organisations and other institutions in the global market become dependent upon Google, as it retains the 'intellectual property' produced by Trekkers for as long as it remains on company servers.

Conclusion

Local tourism boards and non-profits have been incentivised to develop panoramic interiorisations of important or unique cultural sites, making digital replications of global spaces virtually accessible for both commercial and cultural imperatives. Trekker facilitates crowdsourced digital preservation and archiving of historical or natural landmarks in a way that traditional means could not; the virtual capture of aging or fragile structures preserves sites prone to deterioration, eruption or disappearance by natural or man-made causes (for example, the eventual eruption of Mt. Fuji will render its existing trails and peaks inaccessible).

That Google relies upon public institutions for this process resonates with the post-industrial, post-Fordist system Google itself is a product of but has also ushered in; that is, an era in which institutions or organisations are forced to respond to an era of systematic defunding by finding ways to monetise cultural commodities to compensate for larger structural changes (e.g., the decline of industrial modes of manufacturing, the global restructuring of the labour market and so forth). Google's reliance upon public

institutions and everyday people to perform the physical labour of digital mapping is thus a rational means of production in the contemporary political economy. However, scholarly literature on the immaterial labour upon which the information economy is based is only beginning to attend to its material and physical aspects (see Miller and Maxwell 2012; Sandoval 2013; Taffel 2012). Moreover, what little research does exist examines the labour of individuals involved in the tasks of material abstraction, not the physicality of labour engaged by volunteers and/or digital prosumers. In this case study, physical digital labour results in a product controlled by Google, harkening back to Innis' concept of monopolies of knowledge and expansion of empire. Here, however, that expansion of empire is in pursuit of commercial rather than public/government interests, which works to reinforce Google's role within the global information economy.

With a focus on sites of tourism and consumption, the Trekker project is not, in actuality, a representation of ubiquitous mapping despite presenting itself as such. Instead, it privileges commercially viable spaces while masking that goal by relying on the immediacy and perceived objectivity of computer-generated cartography, photographs and code to present itself as a 'real' representation of the world. As such, Google Maps and the Trekker project represent a modern, digital manifestation of the ideological nature of maps and mapmaking.

Notes

¹ Accessible via <http://maps.google.com>

² The collection of images from Mt. Fuji, for example, include more 14,000 panoramic views of everything from the Yoshida trail, mountain way stations that one journalist describes as offering 'hikers a chance to take a rest and look out at the clouds from a view normally only available from an airplane' (Strange, 2014).

³ The wearer can also control the cameras from his or her Android phone (the mobile operating system developed by Google).

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