Code, Content, and Control in Spatial Search

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Organizations that facilitate practices of spatial search are playing an ever more central role in the lives of billions of people. This is because they are making editorial, economic, and ethical decisions that shape our lives (Kitchin and Dodge 2011; Graham et. al. 2013). Organizations like Google and Apple, and platforms like Wikipedia and Facebook are arbiters of not just what we see and read, but what we know about our world, and how we navigate through our world.

Because of that, and as they become ever more integral to our lives, it is instructive to turn to some provocations of the late Tony Benn, a British Labor party politician. He famously had a set of five questions that he said that we should always ask any powerful person: “What power have you got? Where did you get it from? In whose interests do you exercise it? To whom are you accountable? And how can we get rid of you?” This paper is organized around those questions, directing them to dominant practices of spatial search:

What power have you got?
Entities that facilitate practices of search are curators and mediators of information (Graham, Schroeder, and Taylor 2014). Searches are usually many-to-one interactions that can lead us to different: representations or truths; voices or controllers of information; places (Graham et al. 2013).

Where did you get it from?
Entities that facilitate practices of search are able to exert power in five primary ways:

Through algorithms. Much of the curation and mediating is carried out through opaque algorithms that are able to respond to a query with targeted lists, layers, or maps of information. These algorithms are often opaque to end users and undoubtedly privilege some content over others. Google, for instance, has long since abandoned a reliance on its PageRank system to determine what content to make visible or invisible in response to any particular query. Instead, it employs a much complex array of code that accounts for a diverse range of locally, temporally, and individually contextual information. While this algorithmic targeting of information undoubtedly has benefits to end-users (e.g., a user in Delhi receiving locally-relevant content if searching for “what time is it?”), it can also create “filter bubbles” that can prevent users from encountering representations of the world that clash with their own perspectives (Graham and Zook 2013). A Chinese and an American search engine user will receive very different imagery if conducting a search for “Tiananmen Square.”

Through data/system architectures. The design and structuring of the tools that we use to conduct searches can exert important influences on how we obtain spatial knowledge. One well-referenced example is the fact that only a small percentage of search engine users ever click...
through to a second page of search results. This means that for all but a minority of people, a search engine’s decision to place something on the first page is a decision to effectively make that thing visible or invisible.

**Through data presences and absences.** It is crucial to remember that even in our era of “big data,” there remain stark differences in the amount of digital content created and indexed about different places and processes (Graham 2014). The “data shadows” of global cities and high-income countries are thick and dense: with many indexed photographs, descriptions, tags, encyclopedia entries, and other geographically grounded content. Yet much of the world remains characterized by thin and sparse “data shadows”—businesses with no digital presence, potential tourist attractions and sites of interest invisible on maps, and important narratives of places either missing or created by people and organizations from the world’s informational cores.

**Through the systems of governance.** The ways that platforms, organizations, and systems of information are governed have a tremendous effect on practices of spatial search. The move toward structured data and the semantic web is, for instance, allowing for the creation of shared meaning across digital contexts (i.e., allowing content to be more easily separated from its containers and contexts). While shared meaning is useful and productive, it can also work to eliminate shared meaning. Returning to the earlier example, while different populations of Jerusalem exist in different language versions of Wikipedia, search engines harvest answers to queries such as “what is the population of Jerusalem” from structured databases like Freebase or Wikidata. These central databases necessitate agreement where disagreement exists (which rarely favors people or groups with minority perspectives).

Furthermore, large entities that facilitate search are able to exert power in one additional way: *through centrality in an attention economy*. Network effects exist that make it difficult to dislodge dominant platforms and services. For instance, if a search engine has a dominant share of human attention, it is better able to test, target, and respond to human behavior. This allows it to retain users, which creates a virtuous cycle for the company. The same can be said for spatial searches conducted via social networks or user-generated encyclopedias.

Practices that are mediated by spatial search are usually influenced by the confluence of many (if not all) of these factors. Microsoft, for instance, registered a patent dubbed by commentators as its “avoid ghetto” feature (Tashev et al. 2007). The patent allows users to be routed from one place to another based not just on time or cost distances, but also socioeconomic variables (like crime statistics). Poor neighborhoods with high crime statistics would then become digitally blacklisted. In this example, it is the confluence of algorithms (the routing system), data and system architectures (e.g., the design of a user-interface to encourage users to use the feature), data presences and absences (e.g., the presence or lack of data that allows a measure of risk to be calculated), systems of governance (choices made by engineers or executives to include that particular feature), and centrality (the propensity of users to avoid trying new and unknown services) that would allow people, their attention, and their economic activity to be channeled in some directions over others.

**In whose interests do you exercise it? To whom are you accountable?**

The full version of the paper (available at [geospace.co.uk](http://geospace.co.uk)) addresses this question in much more detail. But the short answer is that almost all large organizations involved in spatial search are accountable to only their owners and shareholders.

**How can we get rid of you?**
Practices of search are always imbued with knowledge politics. Because there is rarely a singular correct answer or response to any query, mediators of search are always making inherently powerful decisions to make knowledge visible or invisible, to promote or demote certain perspectives, and to represent or hide particular places and processes. Furthermore, spatial search, even more than other types of search, highlights some of the power that information mediators have. The opportunity cost of performing a spatial search and then using those results to navigate to more than one place is comparatively high. This gives mediators of spatial search a tremendous amount of power to influence not just what we know, but also what we do and where we go. Because mediators of spatial search are rarely managed with the wellbeing of their users or the wellbeing of society as a priority, we should be asking what alternatives might look like.

Despite the litany of abuses perpetuated by the nation-state with respect to the mediation of information (e.g., excessive censorship or intrusions of privacy), it remains the only mechanism of governance that we have in which each person has one (and only one) vote. As such, it remains a potentially powerful force to ensure that minimum standards or best practices are adhered to. We might, for instance, imagine anti-discrimination laws being more cleverly applied and enforced in the contexts of spatial search. We might also see a need for explicit manipulations of the mediation process (e.g., paid advertising) being more clearly labeled as such. The state’s role in education could also be harnessed to make “critical code studies” and “critical data studies” a much more prominent component of universal education. However, the risks of heavy state involvement are significant, and it remains that much can be done through horizontal rather than top-down initiatives.

Search engines survive in an attention economy. Thus, if any organized re-direction of attention occurs (such as through boycotts or the construction of alternatives), the organizers of that change have the power to enact important change in the world: either by shifting attention to other mediators or by encouraging existing mediators to change their practices. Some priorities are: the need for more serendipity to avoid people being trapped in informational filter bubbles, the need to make not just the “known knowns” visible as search results, but also the “known unknowns,” the need for much more visible debate about who benefits and who loses out from any particular act of mediation, and the need for more transparency about some of the key logics used to make some information, processes, and places visible, and others invisible.

Benn’s five questions offer a useful lens to guide inquiry into who benefits and who doesn’t from particular modes of the capture, storage, flows, and presentations of information. But they also lead us to create alternate visions and ask how the regulation, manipulation, and mediation of information might be carried out in very different ways. There are many indications that currently dominant entities that facilitate practices of search are amplifying rather than circumventing the power of the already most visible, most wealthy, and most dominant; that predominant practices of search do nothing to reconfigure virtuous and vicious cycles. Benn’s provocations, as well as conversations such as the one that this paper is a part of, give us an opportunity to hold entities that facilitate practices of search accountable for the power that they wield and re-imagine what more ethical or socially just practices might look like.