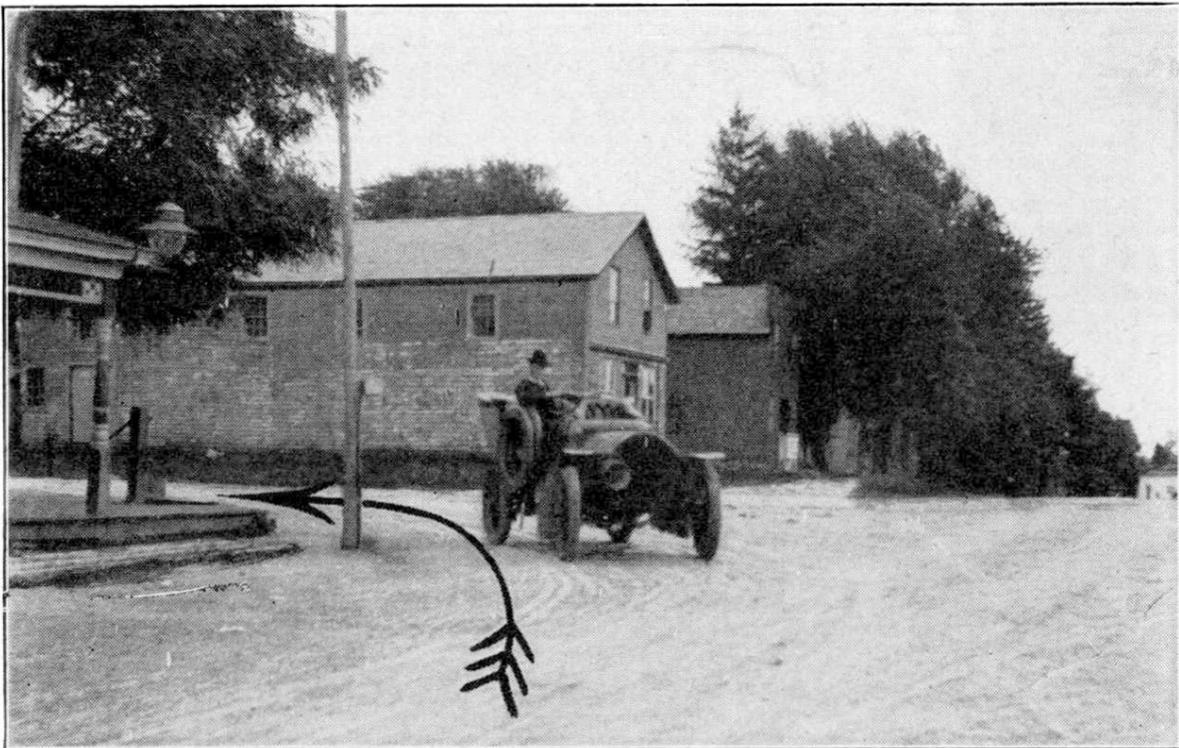


MAPPING BY OURSELVES: TOWARDS A MEDIA HISTORY OF GEOMOBILITY

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Using the example of three different augmented reality and social media navigation applications, this paper demonstrates the importance of choosing the genuine mobile, rather than the stationary, as the starting point of media historical examination.



TO LEFT, EAST

Half Day. Next turn C. & N. W. tracks. Highwood, six and one-half miles.

Fig. 1. Photo no. 18 of The Rand McNally Photo-auto Guide: Lake Geneva to Chicago (Chicago, New York: Rand McNally & Company, 1909).

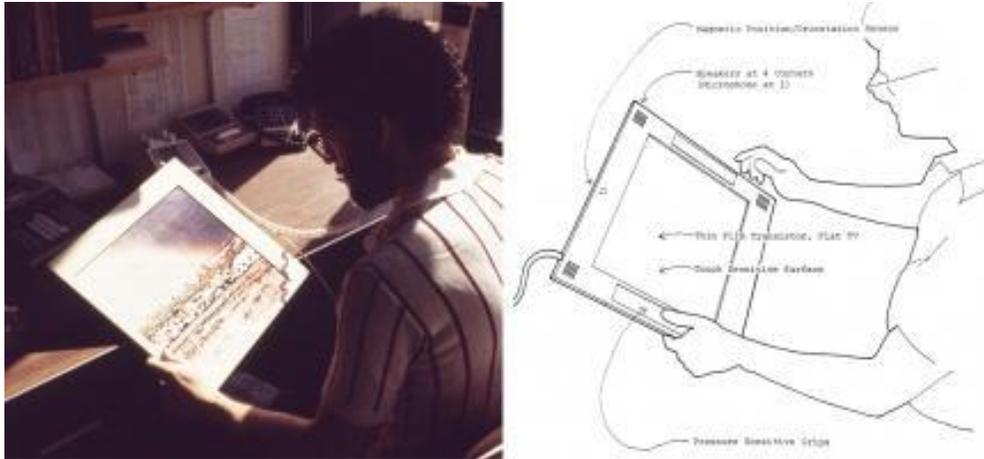


Fig. 2. Dummy (left) and conceptual diagram (right) of equipment for hand-held mapping window.



Fig. 3. (No) live map of Waze in the area around Munich (<http://world.waze.com>).

0. Introduction

In general, there is an understanding in media theory (for instance, in the interpretation of Paul Virilio and others) that implies a logical continuance in a sustained acceleration from the immobile to the mobile, from the stationary PC to the laptop, to the mobile smartphone, to some nanotechnical device in our brains, and so and forth. This paper aims to show that it is worthwhile to take the opposite view: to take the mobility of media as an antecedent, and the stationary as a transitional stage, because these heuristics return data (Latin 'dare': as something given) to their ontological status.

Although augmented reality navigation apps like 'Wikitude Drive' (www.wikitude.com/en/drive), which can be downloaded from the Apple App Store or the Android Market, appear at first glance to be something completely new, they are in fact based on a very old cultural technique.

1. Navigation in 1907: Photo-auto guides

Virtual travel through pre-recorded spaces can look back at least to the year 1907, when the first attempt at capturing residential streets of select routes in photographs took place. The idea was to make them available as ‘photo-auto guides,’ with textual and pictographical route instructions superimposed.

Photo-auto guides lasted for only a couple of years before they were displaced by route books and, later, by road maps. But photo-auto guides existed before road maps were publicly available, and they were widely distributed. [1] Why did they fail? Why couldn't they accumulate collective knowledge? This is, to use a term of Bruno Latour's, a question of “optical consistency.” [2]

Part of the answer lies in the fact that, while photo-auto guides placed a great deal of emphasis on establishing a kind of navigational first-person experience, this was not sustained, not standardized, and could lead to frictions. Figure 1 makes clear that the visual language was not maintained. While the navigation instructions were layered within a series of photographs as if arrows had been drawn in the dust of the streets, some photographs showed ghost drivers who were driving in the opposite direction to that indicated.

In addition to this, there was a problem with the medium itself, and its mimetic qualities, which also caused disadvantages. In Europe, where nearly all roads had macadam and had been surfaced for years, it was possible to issue maps that did not go out of date. But in the U.S., people were only just beginning to realize the value of good roads at the beginning of the 20th century.

“Often one notices a new highway where a year before another one has been used to get to the same point. This shows the uncertainty of routing,” stated John P. Dods in his article “Advancement in Art of Pathfinding” (1911). The roads themselves were constantly changing, so there was uncertainty about the accepted routes.

As the infrastructure as well as the tracers/vehicles moving about on it were mobile at that point in time, the use of photographs or maps could not result in the creation of “immutable mobiles,” a constancy in form across variation, that allows organizations to collect information and to exert control over spatial distances. In order to understand the relevance of these mobile fixations, we initially need to take a step back and look at the big picture.

In his studies in media ethnology and the sociology of technology, Bruno Latour traces the transmission of signs and the linking of people, artifacts and signs via mediators, delineating the logistics that make changes of scale possible. Seen from a media studies perspective, this enables the writing of a media history founded on the concept of mediation and drawing on the comparative analysis of multiple short chains of media translations, as well as on the tracing of cumulative technological developments.

For the history of inscription devices, this means that you have to focus on the invention of “objects which have the properties of being *mobile* but also *immutable*, *presentable*, *readable* and *combinable* with one another,” [3] because the more artificial and abstract the inscriptions, the greater their capacity to be associated with others and thus to approach reality more closely. The degree of similarity serves as an index in a chain of association, which leads, seemingly unavoidably, to standardization and institutionalization within “centres of calculation.” [4]

Coming back to our case study: As the roads as well as the vehicles moving about on it were mobile, and therefore no 'immutable mobiles' could be generated, how could knowledge be gained? It was difficult with established epistemic methods, and so the publishers took up a new idea: they would produce maps that contradicted the scientific geodesy and cartography of the time – just as neogeography and other grassroots movements do today.

To produce these maps, cars were sent out to gather the information for route directions. In each car was a sketch maker who had to be able:

1. to record "all route matter in the form of a sketch showing their proper relations in the road being traveled all intersecting roads, landmarks, schools, churches, railroad crossings, telephone poles, etc." while driving in a moving car on rough roads; and
2. "to imagine himself traveling above the road in a flying machine as it were, looking down, in order to get an accurate idea of the angle at which two roads intersect." [5]

So there was already a combination of real-time recording and a planimetric a-perspectival view, something digital mapping companies are trying to accomplish with GPS survey cars today.

To make the sketches usable for navigation, they were first transformed into texts, then diluted and reduced into the essential information on the route. The factors that emerged as essential were: how great is the distance to where I need to turn off and what landmarks tell me that I should not turn off (in other words, that I am on the correct route)? In this way, the topological structure was georeferenced through a human actor.

Photo-auto guides therefore thwart Latour's media historical observation: The more artificial and abstract the inscriptions, the greater their capacity to be associated with others and thus to approach reality more closely. In place of photo-auto guides, a standard without layering techniques developed that used photographs simply as illustrations, or was purely textual. It was constructed in such a way that for each change in route, all the navigator needed to read out was: 'After ... miles at ... turn'

The intermediate result of this observation is that the problem with photo-auto guides was, among other things (e.g. the absence of scalability), their lack of optical consistency, as they were not in a position to follow an abstraction process and create 'immutable mobiles.'

2. Navigation in 1977: Mapping by Yourself

'Mapping by Yourself' was the MIT Architecture Machine Group's forerunner to the 'Aspen Movie Map,' which is acknowledged as "the first publicly shown interactive virtual navigable space." [6] The 'Aspen Movie Map' offered virtual travel through pre-recorded spaces. A videodisc-driven program, it allowed the user to navigate on-screen through the streets of Aspen by choosing new directions at each displayed crossroad. To do this, the user touched left/right arrows that were graphically overlaid on a touch-sensitive screen. It was also possible to stop, view houses, meet people, or even to change the season.

However, the original project, 'Mapping by Yourself,' was even more ambitious. The first DARPA-funded project of the Architecture Machine Group was designed in 1977 as a flat, hand-held PC with a touch-sensitive display that knew its own perspective and position and worked with a 6" x 6" Westinghouse

display (Fig. 2). The technique for sensing the panel's orientation and position was initially based on ultra-sonic sound ranging, but later switched to a position/orientation sensing system produced by Polhemus Navigation Sciences and based on measurements made of a neutating magnetic field. This system was implemented within MIT's media room.

There are, of course, many similarities between this device and tablet computers. However, the initial idea of 'Mapping by Yourself' went far beyond what an Apple iPad, for example, is able to do nowadays: "The resultant display would give a user the sense of holding a 'magic window' through which he could observe an otherwise invisible world about which he could move in 'real' world fashion." [7] One idea for an application was "to move the window to any vantage point for 3-D views onto a 3-D geographical model. This will permit the user to look down on an environment in conventional map format, then to move the window for an aerial perspective or even to position the screen vertically, so as to see surface features in elevation and subsurface strata in section." [8] A guided tour application that could be used by soldiers in unfamiliar territory was also envisaged.

'Mapping by Yourself' should be seen as part of a series of 1970s technological inventions at MIT that had new graphical user interfaces specially developed for laymen, such as 'Architecture by Yourself' or 'Camouflage by Yourself.' However, the objective of 'Mapping by Yourself,' "to make map reading at one with map making," was not accomplished [9]. Why was this the case? The reason lay not so much in the technical difficulties experienced within the Architecture Machine Group as in the lack of consideration that was given to incorporating the accumulated information into a center of calculation. There was no immutability.

We have a similar problem today: It is a misunderstanding to think that it is the locality itself that matters, if we talk about 'locative media' or 'netlocality.' Instead, it is the form, the inscription into a grid, that makes the difference. And this is what was not considered in 'Mapping by Yourself.'

Considering the two examples presented in this paper, we have now seen:

1. centers of calculation without optical consistency in the layering process, and
2. optically consistent layering without immutability, without centers of calculation, without inscription into a social structure.

3. Navigation in 2011: Waze

The final example is the social mobile app 'Waze,' which relies on crowdsourcing to build and update road maps. The basic idea of Waze is that in order to get wherever they need to go to as quickly as possible, people can download the application onto any smart phone with GPS functionality, and it will provide a driving service including real-time traffic and accident alerts, as well as free turn-by-turn navigation.

However, the specific is not the media product itself, but the embedding of its form of production. "The live maps, updated in real-time, are the heart of the system." [10] The company generates these maps by tracking GPS on users' phones. In the beginning, there is most often no map at all (Fig. 3). When there are at least three users driving along the same route, the platform takes this data and uses it to create a road map and traffic information. A one-way street, for example, is recognized as long as there is no one driving the other way.

Di-Ann Eisnor, community geographer of Waze, describes the system as follows: “Just by turning it on and driving, we are able to collect information on the GPS traces, the time stamps, the road directions – essentially to create a fairly accurate grid of information, and we are turning it into a navigable base map that has traffic as well as social layers and special driving attributes on the top of it, all from the mobile device.” [11]

Thus far, Waze resembles the geodetic knowledge gaining outlined by Latour: The medium gains in accuracy by maximizing mobilization and immutability. The more drivers use the application, the more up-to-date and accurate the maps and the associated data become. “The many places where these texts are synoptically assembled offer many counterexamples [...] These counterexamples can be added to the old texts and, in turn, are spread without modification to all the other settings where this process of comparison may be resumed. [...] So, at the end, the accuracy *shifts from the medium to the message* [...]” [12]

Therefore, Latour’s mediation theory not only has the potential to explain the phenomenon of the time-lag between the introduction of a medium and the point at which visual representations within this medium become precise, it also contains a media-historical narrative that passes right across analogue and digital media, right across human and non-human beings.

However, there is one difference in the accumulation process, and this has a lot to do with the difference between analogue and digital media: If you read Latour carefully, you will recognize a shift from media as “centres of calculation” to media as “platforms of calculation interfaces.” This indicates a general shift in Latour’s thinking from BC to AC, ‘before the computer’ to ‘after the computer’ – a shift that can be very well explained by looking at the evolution of digital cartography, as Latour does in his paper “Entering a Risky Territory.” [13]

The difference lies in a fundamental ontological distinction between “looking at a medium” and “logging into a media platform,” e.g., a databank inquiry, a Web search, etc. It is in fact making a distinction between parasitic mimetic media usage and practical navigational usage. Latour asserts that digital technologies have reconfigured our understanding of mapping, such that navigational interpretation of digital maps is increasingly taking precedence over their mimetic interpretation.

Media are thus no longer just mediators, but platforms that permit both mimetic and navigational usage, platforms that create a bridge between the different oligoptica. Even if Latour takes a stance against a mimetic interpretation, his understanding of the option of a retrospective distinction between mimetic and navigational use of digital mapping assumes that both conditions can always also exist in action. This understanding is, indeed, substantially different from that of Latour’s early papers.

The term ‘platform’ thus represents a modification of Latour’s media understanding, a turning away from “centres of calculation” towards “platforms of calculation interface” that rely on different closely neighboring “stepping stones in order to achieve the miracle of reference.” [14] This interpretation allow us not only to call for a theoretical conception of interfaces as Latourian quasi-things (inscribed with programs of action) that are dealing via Facebook and other social media platforms with quasi-people (prototypically demographic types), but also to mark a general conceptual shift in perspective.

So far, media have been seen as something immobile and ‘still framing’ in media history and media theory, as processing immutable mobiles (data) and retaining (storing) them. Even the notion that today’s

media practices are the apparent logical continuance of a sustained acceleration only supports the assumption that an alleged deceleration would lead us back to the basis of the statical. Rather, the establishment of mobile media allows seeing data (software) as something given to mobilize media. This heuristic returns data to their ontological status. Even more: If it is not the stationary (PC, TV, etc.) that is chosen as the starting point of examination, but rather the genuine mobile (hand-held devices, paper, etc.), a new disciplinary field of Software Studies opens up, and media history realigns. From that perspective, the mobility of media consequently appears as an antecedent, and the stationary as a transitional stage.

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