SOCIAL MEDIA AS A VISUALIZATION TOOL: MAPPING THE URBAN LANDSCAPE

ACKERMAN, AIDAN
School of Landscape Architecture & Director of Digital Media, Boston Architectural College, Boston, MA
aidan.ackerman@the-bac.edu

GARVER, BETH LUNDELL
Director of Foundation Instruction in Practice, Boston Architectural College, Boston, MA
beth.lundell-garver@the-bac.edu

1 ABSTRACT

The primary goal of this project was to test the potential of social media as a format for capturing and cataloging information about urban spaces and landscapes. For this project, social media applications were used by groups of students to collect site-specific data such as location coordinates, date and time, and other location information. This data collection and mapping process was presented and analyzed, along with the resulting visualizations. Final output demonstrated that commonly-found digital devices such as smartphones could be used to collect and broadcast data attached to spatial location and experience. This workflow and its results may incite further dialogue into patterns of visitation and usage of urban landscapes, building a deep and diverse knowledge base of information to draw upon as part of the design process.

1.1 Keywords

Social media, site-specific data

2 INTRODUCTION

Cartographic mapping tools have evolved over millennia to reflect the changing picture of the urban landscape. As humans have planned and developed land use and spatial configurations of towns, cities, and regions, the tools used to navigate and understand these spaces have become continually more complex. Mapping platforms have graduated from ancient engraved clay tablets, papyrus, wood, and paper prints using devices such as the compass, quadrant, vernier, telescope, and aerial photography. New digital cartography comprises satellite imagery, global positioning systems (GPS) and geographic information systems (GIS). Mapping tools are used to describe extents, landmarks, and other physical characteristics belonging to the place it represents, allowing people to successfully traverse its spaces; yet, "the map is more than merely a passive representation of the territory." With the introduction of digital technology that can track and aggregate human movement and activity in real time, user-generated maps reveal instantaneous sociological behavior , emphasized by new patterns, relationships, and realities revealed through data visualization. In Network Nations, Ben Schouten and Yuri Engelhardt propose that "Our well-developed visual processing skills – such as the ability to detect patterns, search quickly for specific visual details, or make visual comparisons – are hindered when data is presented in text, tables or databases." They suggest that comparative exploration and abstraction of data is more easily understood when given a 'visual structure' composed of conceptually significant shapes, colors, or spatial relationships.

While the history of cartography and nature of changing mapping tools are widely researched, this project aimed to explore the use of new digital cartography and social media as an educational tool for teaching beginning design students how to represent their collective experience in the urban landscape. Social media comprises technologies which allow individuals and groups to create and share information and ideas using digital technology devices such as WiFi and GPS on a computer or smartphone. As part of a first semester core course at the Boston Architectural College (BAC), new design students participated in an experiment using social media as a mapping tool during a field-based module called CityLab Intensive.

Of importance is the notion that social media is a catalyst for popularizing user-generated content particularly because it promotes equal access to the exchange of ideas upon usage of these devices. With 83% of American adults between ages 18 and 29 owning a smartphone in 2014 over 92% of householders between ages 15 and 44 with a computer in 2013, both of these devices may soon be ubiquitous. One might consider them more common than the aforementioned cartographic tools — and perhaps even a pencil in the 21st century design school.

The CityLab Intensive experiment sought to introduce students to methods of mapping their urban explorations using the digital armature of the smartphone, in conjunction with more traditional pencil sketching assignments. Faculty had observed that those students who entered the program with few digital skills eventually gained these skills as a result of digital media classes during the foundation year, yet continued to exhibit lack of confidence in applying this knowledge. The experiment encouraged mapping as more than mere documentation, but rather, an introduction to the process of site analysis, data collection, and design narrative using a digital device with which students were familiar

During CityLab Intensive, all newly enrolled students at the Boston Architectural College begin their design education with a four-day immersive experience in Boston's urban landscape. In this context, 'the field' is understood as the territory of the City and its application as 'the lab' or classroom for introducing multidisciplinary design inquiry, discovery, and collaboration. Student teams are led by teacher/design practitioners who conduct a series of hands-on and reflective activities centered on developing a critical reading of urban space at a range of scales — from the design of a park bench to the regional expanse of a public transit network. The course situated the City as a foundational tool for staging the conceptual framework of design education and communication.

As a primer to concurrent design education at the BAC and full-time work in the design industry, CityLab Intensive used concepts of mapping — point, line, polygon, and orthographic drawings — that highlight set 'design lenses' or topics including human comfort, mobility, open space, built form, and culture.. The course sought to acknowledge that even digitized maps represent a curated reality reliant upon a set of affected human assumptions or scripts. A primary objective of the course was to allow students to embrace discovery and analysis using familiar digital media, while reminding them that the process of mapping, like design thinking, can be equal parts subjective and objective.

3 OVERVIEW AND GOALS OF THE PROJECT

Using social media as a tool for visualizing collaboration, emergent design intelligence, and human experience of urban space, the hands-on project encompassed several major goals. The project included two pieces, a student assignment and a faculty research project. The larger goal of the faculty research project was to test the potential of social media for mapping urban spaces. The student assignment was focused on having students familiarize themselves with mapping and analysis concepts, with the goal of having students use commonly-found digital tools which did not require a high level of training and expertise.

The first and primary goal of the project was to familiarize students with concepts of data mapping and analysis. CityLab students are a diverse group, including both graduate and undergraduate students, and four degree programs including architecture, interior architecture, landscape architecture, and design studies. The faculty involved in the development of this project wanted to introduce the research and application of created data as a common element across disciplines. Additionally, their aim was to introduce mapping and data analysis as products which have the potential to inform spatial design at a range of scales and hierarchies.

The next project goal was to demonstrate that large-scale information about a site's context has value when juxtaposed with smaller human-centric scales of observation and analysis. During the four days that students spend in CityLab, they traverse the city in groups drawing, sketching, and photographing their experience. Much of the information that is recorded is subjective observation; students are learning to critically read the city with fresh eyes and to observe otherwise inconspicuous details about patterns of use and activity within the city's buildings, open spaces, and infrastructure. Each recorded observation, each sketch is a conscious decision to capture notable information and reflect on it in the moment. Part of this experimental exercise was to request that students also contribute more uniform or possibly more objective data -- like time of day, altitude, or location -- to be analyzed at the end of their trip. The experiment proposed that students would be able to extract meaningful information simply from the visual patterns established from the data itself; wherein, to create new or otherwise unseen realities. This realization was intended to fundamentally introduce students to the validity and purpose of capturing, gathering, and representing spatial data as constructed or uncovered narrative.

An important component of the project was allowing all students to become comfortable with digital workflows from the first day of the semester. In past courses, faculty observed that students entering the program with few digital skills eventually gained them as a result of subsequent digital media classes, yet they continued to exhibit reluctance in applying their knowledge of digital media to their design process. Through participation in this assignment, one goal was that faculty could introduce the concept of digital tools as essential, meaningful, and accessible. One desired outcome was that students would feel comfortable re-using the digital mapping workflow they had learned through this assignment. To help with this, significant time was dedicated to thoroughly documenting the step-by-step process for capturing, downloading, mapping, and outputting the data so that students could apply this exact workflow to future projects throughout their design education.

Of the many intended outcomes of the experiment, the first and most primary was that the students would successfully navigate the many steps of the digital workflow and create a successful final product. CityLab students were new to design school having just entered the program, and faculty knew from prior experience that students entered the program with a range of digital skills from novice to expert. For this reason, it could not be assumed that every group would be able to complete all of the steps of the assignment.

Beyond the primary intended outcome of completing the work, there were several secondary targeted accomplishments of the experiment. One of these targets was for students to embrace data-driven visualization workflows and recognize their value in the design process. Furthermore, as part of this intended outcome it was hoped that the end result would facilitate students' awareness of large-scale patterns of human movement, particularly in dense urban areas. In comparison with a single site visit made by one person, the aggregation of many students' visits over a length of time was hoped to yield more complex and revealing information about the students' activity. A single site visit captures a single moment in time, and largely reflects the observational patterns of the visitor. A single site visit may also be shaped by unrelated elements such as weather, month, day, time of day, other events happening in the city, etc. While a larger data set generated by multiple contributors still reflects these individual

patterns to a degree, recurring patterns of observation, use, movement, and hierarchy should emerge. By using visualization as a tool to show a physical location where an individual student made a decision to stop and photograph their surroundings, and by combining all photographed locations into a large map, it is possible to capture a series of these isolated incidents and present them as a whole. The faculty was hopeful that this would facilitate students' understanding of visualization as a tool which can aid the viewer in deriving meaning from simple data. In allowing participants to view each photograph as one among many, perhaps it might be possible for the participant to comprehend, by observing the visual density of thumbnail images, which locations in the city contained something which a student felt was worth capturing.

The final goal of this experiment was to test the smartphone as an information capture tool. Some proposed strengths of the smartphone included: the ability to quickly capture, geotag, and upload data; the ability of the smartphone to use cellular network data signals to share captured information with other users in real time; and perhaps most significantly, to allow the user to act most naturally throughout the process of capturing their environment over time, in turn producing more authentic results. Because the smartphone is a device which is already used throughout daily activity by the user, it is suggested that the spontaneous information captured by the smartphone's camera is more authentic than with another device such as a digital camera alone. It is assumed that prior to CityLab, most students had already been carrying their smartphones with them to most places, and already were using them to take photographs – and that fewer students regularly carried around digital cameras and used them every day. Because of this, the smartphone had a greater likelihood of being a familiar device which already was used frequently and most easily as part of the student's daily routine. An additional proposed benefit of using the smartphone was that students would be able to use it in future data capture and analysis scenarios beyond the CityLab Intensive and in subsequent courses as Visual Thinking, Design Representation, or disciplinary studios.

4 RESEARCH METHODOLOGY

The framework of this research included two parts. The first part was the digital information-gathering process, where several groups of students individually documented physical areas of the city and uploaded them to social media sites as photographs and written text. The second part was the information aggregation process, which involved sorting through the entire group's photographs and text, creating an image map indicating the location where each photograph was taken. In this specific iteration of the methodology, students spent a total of 4 days traversing the city, using their smartphones to take photographs and upload written observations. Social media apps Instagram and Twitter were used to collect these observations along with site-specific data such as location coordinates, date and time, and other location information. At the end of the 4 days, each group used a workflow which allowed them to overlay their geo-located photographs on a digital map, with each photograph appearing the physical location where it was taken. Students were given complete freedom regarding the location, time, and quantity of their photographs and were not instructed on what to photograph. However, students were given some guidance in terms of how to interact with and observe urban areas throughout the exercise, and faculty section leaders would often prompt students to notice and inspect elements, reflect on experiences, and question assumptions. While students were largely autonomous in deciding what to record, faculty did play a role in supporting and guiding the students' process and in reminding them to actively use their smartphones as tools, in addition to their pencils. Students were not instructed when, where, or what to photograph, as a key assumption was that students would photograph more meaningful or significant elements. Within the CityLab experience, a photograph might be used to capture something visually important, but it may also be used to capture a less significant spot where a significant conversation, interview, or other exchange occurred.

Along with the visual information captured in the photograph, the students' smartphones also recorded the date, time, and approximate location where the photograph was taken. Most smartphones are accurate within approximately 8 meters; while this does not pinpoint the exact location of the user, for the purposes of this project it establishes the approximate location to a satisfactory degree. At the end of the four days, students were instructed on how to upload and digitally organize their photographs. Students did not upload every photograph that they took; because of time constraints they only selected the photographs they judged to be the most significant. Google Drive was used to upload and host the photographs, and Picasa was used to automatically position small thumbnail images of the photographs

on top of an aerial map of Boston. The final image map was printed out on a large scale plotter for a critique, displayed alongside printouts of each selected photograph, as well as the group's sketches, diagrams, and notes from their experience observing the city.

Rather than introduce an unfamiliar digital tool such as a handheld GPS, the students' own smartphone was used, using the phone's built-in settings and camera software. An assumption was that the use of a familiar tool, one that was owned by the student and used frequently, would ensure that the tool was used frequently by the student, and that the student would not greatly alter their patterns of usage. By keeping changes to the student's phone setup minimal, this ensured that the student used it in as close as possible to their usual manner. This was essential for two reasons. First, the overarching goal was for students to remain immersed in the CityLab experience, not focused on using technology. Second, this allowed for more authentic data, since the student was not changing their regular patterns of phone usage. The digital mapping workflow relied on using established tools such as Google Drive, Picasa, and Flickr, tools which were likely familiar to students who were new to design. Advanced, more complex software such as GIS and image editing applications were avoided, since many students voiced apprehension about their ability to utilize such software without prior experience. A key challenge which faculty anticipated was striking a balance between the difficulty of the workflow and the visual quality of the final product. It was important to have students' produce a visually compelling final product, while simultaneously keeping the workflow as simple as possible.

5 FINDINGS AND SUMMARY

At the completion of the experiment, the experiment was evaluated both on the success of the workflow as well as on the success of the visuals produced by the students. Most students were able to complete the mapping workflow successfully, although some did have significant assistance by faculty. These were largely students with little-to-no prior experience in mapping and digital image creation. Since existing web-based tools with user-friendly interfaces were used, students were not required to learn specialized software to map their images. The workflow itself fit seamlessly with the overarching goal of the CityLab Intensive, which was to facilitate students' exploration of Boston. Since students were only required to adjust a single setting on their smartphones the first day of the experiment, once the setting was changed the smartphone collected location and time/date information without any further input from the student. At the end of the experiment, many students used the final image map as a central organizing element with which to locate and anchor their other notes, sketches, and photographs.

Figure 1. CityLab student using photograph map to geographically reference work. Photo by author

This was seen as a positive outcome, since the map allowed students to geographically locate and reference work other than what was captured on their smartphone, building a richer set of imagery with which to tell a story about their experience. Many baseline assumptions were proven correct: commonly-used digital devices can be used to collect spatial and visual data without modifying the device or using special software; early design students can successfully apply a specific digital workflow to create a map which displays information collected over a period of time; and the map which was created indicates patterns of human movement and engagement with urban spaces.

However, while the overall visual impact of the final product was sufficient to communicate the data, it did not create a more refined reading of the data through creation of visual hierarchy. Additionally, since each map represented a range of one or several persons' data from a student team, the experiment resulted in several finalized maps but no one map which included data from all groups. Therefore, all groups' captured images were not able to be read in aggregate, preventing larger-scale evidence from emerging. Since each map relied on the same tools and workflows, each map used the same visual language. While this allowed them to be compared side by side, it detracted from the end product since no team was able to create a distinct visual identity.

With respect to the actual workflow employed, there was concern that students would focus more on satisfying the specific steps of the workflow than on broader concepts regarding the use and value of the mapping exercise. In some student teams, this was the case. Additionally, another more unexpected issue was discovered. Since faculty did not manage or otherwise have control over the set of web-based tools used in the workflow, if any of the tools were to be removed or even slightly altered, the documented workflow instruction ceased to function. Overall, given the aforementioned conditions of the experiment, the final visual product of the mapping was less successful than the students' active engagement in the data creation process.

In constructing this experiment, much of the emphasis was on ensuring that an accessible workflow could be given to the students for both current as well as future use. Both because of the inability to manage web tools, as well as the shift in focus towards the workflow, faculty decided to make some modifications for the next iteration of the project. The focus of the experiment has shifted away from presenting students with a specific data visualization workflow, and it has moved towards emphasizing the process of using social media to create an informative dataset for generation of more graphically sophisticated maps composed after the end of the course. Students will collectively capture, tag, and upload their images using specific hash tags or keywords in Twitter or Instagram. Instead of having each student create a single map of their own data, the faculty will be able to access these hash tags to gather and visualize all CityLab activity by members of the entire group. This is predicted to create a more meaningful final image, one which more accurately represents the behavior of the students as a whole.

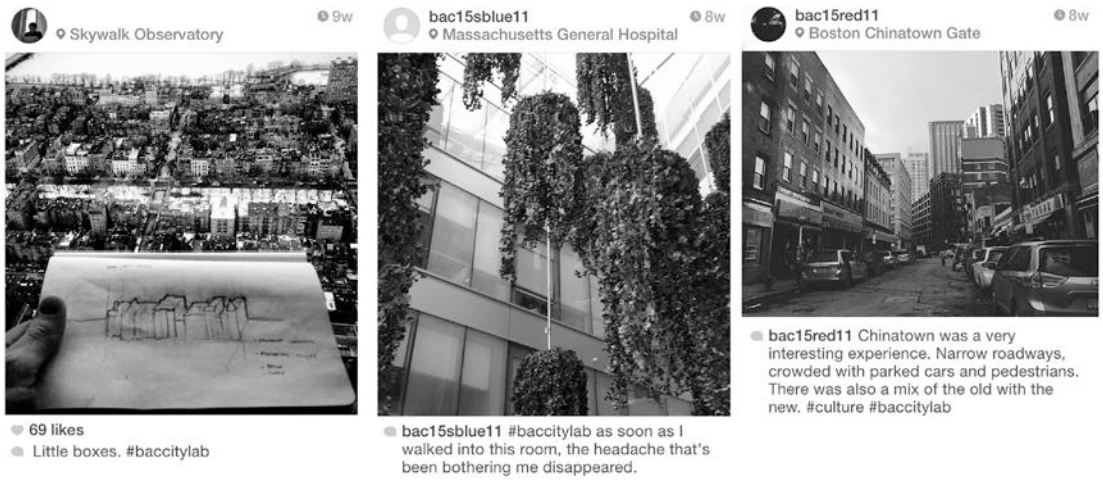

Figure 2. Social media posts created by BAC CityLab students. Photo by author.

Further applications of this workflow and its results would be beneficial to understanding the potential of social media as a mapping tool. Expanding the use of this workflow to cover longer periods of time, a wider range of settings (both urban and otherwise), and broadening its use to include longer investigations such as design studio or research projects will all provide further insight into its effectiveness. Moreover, further dialogue about the use of social media for analysis of urban spaces is critical in understanding how students, faculty, and professionals might use these tools in the design process. It is clear that there is potential for using social media as a mapping tool; information can be quickly and efficiently gathered without much advance preparation, and large amounts of information generated by others already exist and are easily accessible. Yet it is not quite clear how this easily-captured information leads to next steps within analysis and design. Some questions to discuss include: Is the educational experience of seeing, recording, and mapping information the justifiable end goal of the experiment, or should students derive insight from the results? Does the information gathered through this mapping workflow provide information that can be used in the design process? Is there other information embedded in social media posts which can be analyzed, such as geometry, lighting, camera angle, or word usage? How can we generally improve and expand the use of social media as a mapping tool?

Today, the BAC's CityLab Intensive experiment continues to test ways of introducing tools of mapping to beginning design students through use of readily accessible digital technology and user-generated data. As Paul Virilio suggested "Trajectory is identity;" new patterns, identities, and realities continue to be sought by capturing and recording human behavior through use of the smartphone as a discovery device employed throughout Boston's urban landscape. More than simple documentation, the experiment will continue to explore the mapping process and its implications of analysis as design agency.

6 ENDNOTES

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