Bottom-Up Organizing with Tools from On High: Understanding the Data Practices of Labor Organizers

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ABSTRACT
This paper provides insight into the use of data tools in the American labor movement by analyzing the practices of staff employed by unions to organize alongside union members. We interviewed 23 field-level staff organizers about how they use data tools to evaluate membership. We find that organizers work around and outside of these tools to develop access to data for union members and calibrate data representations to meet local needs. Organizers mediate between local and central versions of the data, and draw on their contextual knowledge to challenge campaign strategy. We argue that networked data tools can compound field organizers' lack of discretion, making it more difficult for unions to assess and act on the will of union membership. We show how the use of networked data tools can lead to less accurate data, and discuss how bottom-up approaches to data gathering can support more accurate membership assessments.

Author Keywords
data-driven workplace; unions; activism; critical data studies

CCS Concepts
•**Human-centered computing** → **Collaborative and social computing;**

INTRODUCTION
As it becomes feasible to render more aspects of life into data, collective organizations find themselves looking toward new data practices to better understand and respond to their members. Proponents of "data-driven" organizational strategies claim data collection and analysis will create actionable insights that will make organizations more effective, efficient, and resilient [52]. Yet this abstract vision of data obscures the necessary role of the human actors in data-driven processes. Research in HCI and CSCW has counteracted this narrative by centering the human experience of making the data work [31, 48, 49] and critically engaging with the implications of data-driven decision-making in light of the inherent decontextualization that comes with large datasets [16, 10, 59].

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In this research, we examine data practices and data-driven decision-making within labor unions in the United States. Unions are a useful case study for exploring challenges in data-driven organizations because they have a long-standing commitment to understanding and responding to their membership. They have always been "data driven," in that a core component of the labor movement's organizing model is to identify, map, and systematically evaluate every worker in the workplace in terms of their support for and propensity to become active in the union [34].

When the labor movement first entered cyberspace at the turn of the 21st century, unionists pondered the degree to which networked computing technologies could support more meaningful communication between union leaders and the will of rank-and-file union members [20]. In support of the "CyberUnion," labor scholar Arthur Shostak argued that networked tools would "empower the rank-and-file as never before" by connecting union members through shared issues, helping them come together to push back against undemocratic practices, both in the workplace and in the union [56]. Gary Chaison countered this enthusiastic support with his concern that such technologies would instead function as an impersonal communication tool for union leadership [21]. He also predicted that the labor movement's technology use would be effective for mobilizing only "supportive participation" ("relatively passive activities that require little time and effort, for example reading the union's web page and discussing union issues with co-workers") among members instead of the more effortful bottom-up leadership envisioned by Shostak [21].

As unions embrace networked computing tools for outreach and membership assessment, it is clear there are still serious communication barriers in the labor movement. These barriers are well illustrated by a recent attempt by the United Auto Workers (UAW) to unionize a Volkswagen plant in Chattanooga, Tennessee. In the US, elections to certify a union are decided by a majority of votes cast by eligible workers [12]. Prior to the vote, the UAW's data showed a clear majority of workers supporting unionization. However, those assessments did not translate into majority "yes" votes on the ballot. Post-campaign analysis [18] attributed the loss to several factors, including an effective anti-union campaign by the employer. However, the mistaken assessment of member support was specifically attributed to "shallow organizing" or a failure by UAW to build a strong organization through member participation [18]. Basing most of their assessments on conversations with workers conducted by union staff, instead of on workers'

participation in organized collective action leading up to the election, may have led UAW to calculate their levels of support on inaccurate or misleading data [19].

This critique of UAW's strategy resonates with Chaison's concerns about "supportive participation" in that both underscore a concern for the lack of bottom-up, member-led participation in union action. But the role for networked data technology in fostering member-led participation, and what it has the potential to enable, is less straightforward. In the forecasts of the Cyberunion, enthusiastic and anxious alike, it was envisioned that membership would be able to directly communicate with the union in cyberspace (*e.g.* through websites, chatrooms, and email listservs)[55]. In Chattanooga, the "cyberunion" had a different structure: while information about members almost certainly went into cyberspace via networked data tools, the interactions that data represented occurred in real life, in the Volkswagen plant and its surrounding parking-lots, and in the houses and front doorsteps of the people who worked there. The interactions were then rendered into data by activists and union staff organizers.

Our research responds to older debates on the role of networked computing technology in the labor movement by examining how data tools are currently being used by unions to understand their membership. In order to understand how data collection is being conducted across levels of the organization and how data practices could support effective organizing, we look at the data practices of field-level staff organizers. These organizers work alongside workplace member activists and report to union leadership, functioning as necessary intermediaries between union strategy and resources and the will of the rank-and-file. We focus specifically on their use of technology to track membership and membership support as a mechanism for communicating local contexts. Our results unpack the relationship between data tools and organizing strategy to show how networked data management systems impact the on-the-ground experiences of staff organizers, and what work they must do to make the data useful for the union and for themselves. We argue that data degradation–a decreased accuracy of the unions' assessments of member support–arises from a combination of the properties of networked data tools with the precarious position of field organizers in top-down organizing campaigns. We propose alternative approaches to tool use that may better coordinate members' needs with union strategy by assessing different aspects of member participation on the ground.

RELATED WORK

Workers, Data, and Organizations

Our work is informed by research into the impacts of information technology in organizations [46, 47, 45]. Prior work has shown how "informating systems" (tools that transform descriptions of activities into information) reconfigure power relations at different levels of an organization [65]. This continues to be a topic of interest for CSCW because the impacts of making information visible in complex organizational contexts are not always straightforward.

Making work visible both reveals and impacts power relations in the workplace [58, 24]. For example, including nursing work as part of permanent medical records can have the effect of legitimating the work of nurses which has previously been rendered functionally invisible [15]. On the other hand, the same visibility can confer greater administrative burden [62] and diminish nurses' ability to exercise discretion [57]. The impact of digital data management tools has been studied in healthcare systems, where the digitization of medical records impacts the discretion and accountability of medical and data workers [14, 51]. But, at the same time, design choices which lower the discretion of the medical professionals can draw attention to and legitimate the work of medical administrative staff [54]. Our research speaks to this discussion as an empirical moment to see how informating systems shape the experience of work for entry-level professional workers in the labor movement, as the systems serve to make field organizers' work immediately visible to different levels of the organization, while at the same time, sometimes hinder the communication of organizers' contextual knowledge.

Data-driven Activism

Prior research in HCI has identified how activists collect and analyze data to produce "actionable" outcomes (informing and persuading stakeholders, securing project resources) in resource-constrained contexts with limited access to data and technical expertise [5], and while upholding commitments to democratic and participatory data processes [38]. Beyond the creation of data, activist-driven data practices support civic engagement by bringing members of the community into spaces of collective negotiation and planning [39]. They also have the potential to reveal competing needs and commitments of different stakeholders [7]. The study of data practices in the labor movement speak to this work because unions consist of mutually accountable stakeholders (described below) working toward shared goals with different accountabilities.

Research in CHI and CSCW has also looked into how civic and community activist groups use data technologies [27, 29, 28, 33]. Research into how activist groups use "illegitimate" [8] technology to mobilize, particularly during times of crisis, reveals that most activists groups organize and maintain their organizations using free tools offered by companies like Google and Facebook, while a technically savvy minority design and actively use alternative technologies (*e.g.* ones that prioritize security)[6]. The data practices of labor unions explores how the use of off-the-shelf data tools complements the use of bespoke systems to mobilize participation, in-person and in the data work, in the context of long-term organizing projects.

Our study of the data practices in labor unions is also informed by prior work studying the role of data tools, and the imperative to become "data-driven," in electoral and non-profit work contexts. The uneasy discrepancy between the promises of becoming data-driven and the practical reality has been illustrated in electoral work [42, 9], where researchers have explored the extent to which data practices actually support effective strategy in political campaigns. Prior work studying the data practices in non-profit organizations has identified

the benefits and challenges to applying business-driven analytic data systems in mission-driven contexts [60, 61], arguing that data-driven evaluation [11] and monitoring practices can disempower nonprofit organizations [13]. Like political campaigns and other nonprofit organizations, unions look to data to inform their use of material resources and rely on a combination of paid and volunteer labor. Union data practices shed light on what happens when the data needs to be accountable not only to leadership and external funding bodies, but also to the people it describes.

BACKGROUND: UNION ORGANIZING

There are several approaches to union organizing that have been put into practice throughout the history of the labor movement. Our case study explores how labor unions gather data about their membership. This section describes practices that are generally consistent across our interviews, addressing the thinking behind data practices leading up to, and after, a unionization campaign. We describe the role of a staff organizer in a union campaign, both in relationship to member activists, and within the context of a union at the state and national levels. Finally, we situate the use of contemporary data tools against older practices to give the context of their use in modern campaigns.

Member Assessment

A key data practice for labor unions is member assessment, *i.e.* collecting up-to-date data about the degree to which individual workers support the union. Labor unions typically assess support for unionization among prospective members to guide strategy during organizing campaigns. Before a union is recognized as the exclusive bargaining agent for employees in a unit, membership is assessed to gauge whether the union has enough support to guarantee recognition by a majority of votes cast for the union in a recognition election (or through majority support by authorization cards in the case of a voluntary recognition [12]). After recognition, unions continue to assess member support, especially leading up to contract negotiations, to calculate whether it is realistic for the union to call a strike (the decision to strike is also decided by majority vote). Worker support for the union is measured using a series of "tests" (sometimes called "asks") such as signing a public petition in support of the union, wearing a union sticker or shirt to work, or posing for individual or group photos for a public poster. These tests are planned by union staff and member activists on the organizing committee, and then distributed to the membership through a system of staff organizers and member activists. The structured conversations with workers leading up to the test form the basis for the assessment along with the outcome of the test (*e.g.* 'did they sign the petition?').

The mechanics of assessing member support vary across union campaigns. For example, in the The American Federation of State, County and Municipal Employees Organizer (AFSCME) Organizer handbook, the assessment system uses a system where "1" corresponds to active support and leadership, "2" is a "solid union supporter" ("passed every test... If the election were today 2s would vote yes"), "3" is "undecided or moveable" and "4" is not supportive of the union, with "no clear path to move them to support" [1]. Other numerical schemes are also used, for example Rogers et al. describe assessment categories used in the 2010 representation election at Delta Air Lines, where Association of Flight Attendants-Communication Workers of America (AFA-CWA) flight attendants were rated a "1" if they would vote "yes" for the AFA-CWA , "2" if "undecided", "3" if "no", and "4" if they were a "strong no" and "expected to work against unionization" [53].

The data collected through assessments guides union strategy in several ways. Most immediately, assessments help organizers track changes in support for the union ("movement"). Assessments are used to allocate campaign resources [43] and gauge whether the union is ready to go to a recognition vote or strike, which is why it is important for the assessment to accurately reflect workers' stances. Organizers and activists are trained on how to assess workers, and–ideally–discuss assessments in debriefs with central union staff (one on one or in groups) to review and calibrate their evaluations. Typically, the organizing committee and union staff will work together to establish benchmarks for assessments to track the level of support and set thresholds for moving forward with stages of the campaign (*e.g.* when to make contact, when to go public, when to file a petition for a union election). For example, a union could wait to file a petition for a recognition election until at least 60 percent of the unit signed authorization cards [17].

The Professional Organizer

Professional field organizers employed by the union are an important intermediary in union data collection. Prior work traces the development of professional union workers [22, 22, 23, 36, 64] and specifically field-level staff [37]. The results of a recent longitudinal study [63] on labor unions' hiring practices indicate that unions increasingly hire staff with higher levels of education levels and experience working for other unions and progressive organizations outside the labor movement. Drawing on prior work, our interviews, and online union job postings [3], we categorize field organizers (sometimes "staff organizers") as union staff who work directly with membership to identify attitudes of individual workers and recruit member activists. Activists (sometimes "activist organizers" or "activist leaders") are either union members or workers seeking unionization who have demonstrated commitment to the union (*e.g.* by attending meetings or completing assigned tasks).

Field organizers travel to job sites, conduct house visits to communicate with workers, and maintain lists of employee information. Field organizers report to lead organizers, who, in addition to being responsible for leading field organizers and activist leaders, may also conduct house and worksite visits. The next level of union staffers includes campaign directors, national representatives, and regional and area directors. Unions also employ professionals at the state and national levels. While different organizing models outline different roles for staff in union campaign decision-making [41], prior research on the role of staff in unionization campaigns suggests that they are a consistent variable in union organizing success [35].

Data Collection

American labor unions have relied on analog information tools such as member lists and "chains" (a networked systems of leads and their followers) for building networks of union supporters since at least the 1930s [30, 41, 50], long before the use of digital technology. Before the introduction of databases, membership data was organized into binders containing individual worker files and charts for groups of workers organized by building, shift, or unit. While union records are now stored digitally, contemporary data practices may still involve paper for membership cards, recording notes about conversations, and circulating lists for organizers and activists to use in the field. Domain specific (and general) data tools discussed in our interviews are described in our results, but unions also collect data from third parties, employers, public records, and political organizations, notably NGP VAN (formerly "Voter Activation Network") a voter database and associated mobile canvassing app–miniVAN–used by the American Democratic Party and other non-profit organizations authorized by the Democratic Party [32, 26].

APPROACH

The key question we ask in this study is how data collection tools and the work practices surrounding them are shaping, and could shape, communication between rank-and-file members and union decision-making. We investigate this question by examining the data practices of field organizers, important intermediaries in collecting data about members and communicating this data to higher-level union staff. We look at how networked data management systems impact field-level staffers' organizational relationships, and what work they must do to make this data useful for the union and for their own everyday work as organizers.

Our investigation is rooted in an interview study focused on people who had, at some point, been paid by a labor union to organize workers. We found participants via snowball sampling from personal contacts and through a local workers' center. We conducted a qualitative, semi-structured interview study using a protocol exploring the following areas of interest:

- The organizing background of the interviewee, what kinds of campaigns they had worked on, and whether they had organizing experience in other contexts (*e.g.* community, non-profit, political/electoral)
- The day-to-day context of their organizing work (either on a specific campaign, or across different projects) and who they interacted with (*e.g.* unionized or unionizing workers or already committed activists)
- Documentation practices, including how they recorded conversations they had or debriefed about with an activist, and how assessments were conducted
- The role of digital and analog tools in their work, including the degree of access different people had to the tool, and who made decisions regarding the use of digital tools
- How their work was evaluated, and the role of data work in organizer evaluation.

Because some of the questions we asked had the potential to encourage negative assessments of interviewees' past, present, and future employers, we report on our results in ways that protect the identities of our interviewees through pseudonymous descriptions of their work context. Participants were informed before the interview about the goals of the research, *i.e.* to expose technical research audiences to the opportunities and constraints of using organizing tools in union settings, in order to improve the design of future tools and data strategy in the labor movement. Participants were not compensated for participating in the interview. Our study was vetted and approved by our institution's IRB.

We interviewed 23 people, conducting 24 interviews that lasted about an hour (63 minutes on average). Everyone we interviewed had, at some point, been employed by a labor union to work with membership data. All but two of the people we interviewed had worked as field-level organizers (one had been hired starting as a lead organizer, and one had no formal union organizing experience). All but three of the people we interviewed were still working in the labor movement at the time of the interview. For the people who gave a starting year, the average date that people began working for a union was 2013.

The interviewees had experience organizing in the following sectors: higher education (graduate, faculty, adjunct, administrative) (17), teachers (K-12, charter, paraprofessional) (5), health care (nurses, lab technicians) (6), home health care workers (2), hotel (2), public employees (accountants, actuaries, analysts, elevator technicians) (2), retail workers (1), custodial workers (1), and airport workers (1). Our results could potentially be shaped by the lack of building trades union staffers in our interview pool; these unions hire from within their own membership at a higher rate than professional and service unions [63] and thus were less reachable through snowball sampling from other sectors. It is possible that building trade unions may have different organizational practices because the staff organizers are hired from within the unions' membership.

Interviews addressed tools that union staff were using to track and store membership data: union-specific software (*e.g.* Broadstripes[2] and Unionware[4]); Customer Relationship Management (CRM) tools (*e.g.* Everyaction); cloud-based database tools (Airtable, KNACK); desktop database tools (Microsoft access); Excel and Google Sheets; and other tools.

The research team met to discuss initial trends arising from the interviews as a preparation for analysis. The primary author then conducted an inductive analysis of our interview data, including notes and transcripts, using standard processes of iterative coding, memoing, and refinement of categories [25]. Initial codes included data anxieties, data aspirations, forms of work required to make the systems "work", and organizational pressures and constraints of data work. Subsequent analysis grouped related pressures and constraints, categorized forms of work, refined the sources of pressures and constraints, and identified the role of technical expertise and worker discretion in making and implementing decisions about how data tools were used.

RESULTS

In our study, we found that field organizers continually navigate two aspects of membership data in their use of networked data tools: 1) how to negotiate varying levels of access to member data and 2) how to calibrate the structure of data to usefully represent locally relevant aspects while still creating reusable and interoperable data. Union organizers did face other recurring challenges in getting the data to work, including usability issues and interoperability between different systems that collect the same kinds of data; such issues implied a clear fix based on a shared idea of what it means for the system(s) to work correctly. In contrast, negotiating access and calibrating structure required making trade-offs for which there is no consensus among organizers for what constitutes normal practice, or even best practice under ideal conditions. Organizers described stances on member access and data representation that reflected different–and sometimes contradictory–ideas about what it means to be a good organizer. Negotiations around access to and structuring data to enact these conceptions of 'good organizing' happened outside of the system, necessitated workarounds, and required action at different levels of the organization (activist, organizer, lead organizer, regional union leadership, and national leadership). We found that the temporal qualities of using networked data tools interfered in specific ways with field organizers' ability to effectively negotiate access and structure. In this section, we first describe the reasons for and nature of the work involved in managing data access and calibrating data structure. We then describe how temporal aspects of using networked data tools get in the way of organizers' ability to do this work.

Managing Data Access

> "In a way, it was easier before we had it all in the cloud because it wasn't technically feasible for lots of people to have access. It had to be really locked down... The database lived on one laptop and you had to take turns using it... I think access issues became more [of an issue] when technical feasibility became less of a barrier. Most people would never think, 'oh I should have access to that room where the filing cabinets are' but when you see a database you see people having it on their phones and you think, 'I could have that."' (P18)

In this section, we discuss how networked data access, or who can see and add union membership information, impacts work practices and sociotechnical norms in field organization. Membership data is critical to unions' missions because it shapes union strategy and bargaining power. Therefore, workers focus on keeping such data up-to-date and reflective of on-the-ground situations (e.g., current, active membership; workplace complaints; working conditions; possible new member leads, etc.). The data is sensitive for both individuals (e.g., personal information, workplace complaints) and the organization (e.g., assessment of membership support, notes on individual workers). By networking membership data, this data can be accessed and updated remotely anywhere at any time by people with access to the database. While this supports the goal of keeping union strategy aligned with conditions on the ground, networked data access also creates key concerns focused on data access control, privacy, and security. These issues arise because of the data's inherent sensitivity and because it can be harder to constrain and control access to networked data. With networked access adoption, organizers were also concerned with how different access policies to networked data did or did not align with core union values. Our interviews demonstrate that there is no consensus about how to negotiate access to union membership data, but that the work of negotiating differential access is central for efficient data gathering and effective organizing.

Standard organizing practice includes field organizers training member activists on how to accurately assess their co-workers' levels of support for the union (*e.g.* [44]). Most of the organizers we interviewed agreed that it was important for member activists to record their assessments in some way. They did not agree, however, on whether activists ought to directly access and input the assessments into the union's data system. We use differential access to describe the varying degrees to which member organizers can access membership data (*e.g.* who can see it, under what conditions, how much they can see, how they input data).

The argument for more data access for member activists to gather and directly report data member assessments is that it empowers them to take ownership of their campaign by giving them more immediate feedback on their progress toward their benchmarks (P8, P12), develops activist leadership (P13), and decreases the amount of time a staff organizer has to spend entering data (P8, P6). The arguments for more restricted data are motivated by concerns that the assessments logged by activist organizers have the potential to be inaccurate:

> "[T]here is a specific level of training and seriousness that comes with assessments and elections... I've been in situations where they thought they had so many 2's [union supporters]... And I had to go sit down with every single organizing committee member and have them walk me through every single assessment, and I redid the numbers and we didn't have it, and had to do an entire new campaign right before the election." (P6)

> "I think the biggest issue throughout the campaign is that our assessments were pretty soft. And I think that one of the lesser commented-upon problems of disseminating data access to the rank and file [union members during the campaign] was that... quite frankly there were a bunch of people who did not make good assessments. And I think that was the point of the organizer one-on-ones, was to actually review conversations." (P5)

Both of these quotes highlight that the work of assessing member support required not only training, but also a dialogue between activists and staff organizers. Having the members input their assessments directly meant that the data could be 'soft', potentially leading to errors in strategy or more work for the organizer in the future.

How union-related data is accessed connects to questions of union strategy by, for example, articulating the correct level of commitment and training member activists need to have in order to gain access to the database. Minimum barriers are sometimes decided by union staff and the organizing commit-

tee and involve completing some amount of organizer training, and maintaining some level of activism (by taking assignments and doing them). These are organizational norms that need to be enforced to protect against malfeasance:

> "The key to making that work was also having really clear and transparent criteria for when someone gets access, when it gets revoked, and why they have the level of access that they do. And then you've got to be rigorous and fair about cutting people off when they don't meet that criteria. Because otherwise, you're going to run into the one person who needs to be cut off for a reason and even though they don't meet the criteria... if they see all these other people that haven't been cut off, it just triggers resentment." (P18)

Field-level organizers, who often mediate data access to activist organizers and other union members, were frequently in charge of developing and maintaining differential levels of data access. Though only some organizers reported problems with negotiating differential access to union data, those that did connected these problems to issues of campaign trust, rank-and-file pushback, and activist participation in union strategy: "access to data is implicit trust. So a restriction of access signaled the breakdown of trust, or a lack of trust" (P3). Organizers also faced administrative burdens in facilitating differential access. Even bespoke systems (in this case, Voter Action Network's mobile application, miniVAN) that in theory support partial and restricted access to union data introduce administrative burdens in practice for organizers to manage and restrict centralized data:

> "Say you're [an activist] on campus in the early part of the afternoon. You're walking and you talk to this woman that you didn't even know, and she's a new [employee] and you find out her name is Kristin something, ok, so to [enter data about Kristin onto your list of contacts] you have to... insert your list number into your [Voter Action Network] app.. so the [field organizer] on the backend produces [a new list including Kristin] and sends them the list number. So if I were to find a new contact, I'd have to log out of that list, log into a new list number, and then assess her." (P6)

In this quote, the staff organizer has to 'cut' a new limited view of the organizing data for the activist she is working with in order for the activist to assess someone that was not on their delegated contact list. This work is considered necessary for maintaining data integrity, but creates an annoying administrative burden on the activist and on P6, who has to, in that moment, create the new list and list number. Organizers can work around this by printing paper lists that are modifiable by hand or work with activists in alternative systems like Google Sheets. Both of these strategies require the organizer to do data entry later. Ironically, whatever benefits a flexible system like Google Sheets confers are diminished by organizers' efforts to create manageable data. For example, one organizer imposed limits on what fields members can access and edit in an effort to limit the amount of data cleaning and coordination that will need to happen in the future: "I don't want them to go 'John's not on my list but I know John. I'll just talk to John' you know, and want to add a new person and a new ask. It doesn't really let you do that. You can click on a new cell and try to add things and it won't let you" (P19). By limiting access, P19 avoids incurring the future work of moving John's assessment from the new ask to the correct list and communicating it to the person who was originally delegated to contact John.

Calibrating Data Structure

> "When I first started here, and I first got into the database that they had, you can kind of customize the header bar they have, and people usually put something that's 'ha ha tongue-in-cheek funny' and there was a cartoon in there of somebody holding a giant pile of paper and things and they're just standing there and it's obviously clutter – it's very obviously clutter – and then the dialog box says 'just collect everything, we'll sort out what we need later."' (P19)

> "It's like some people said 'I want to create a database that could effectively stand in for the actual world' and that, to me, is just chaos. Sometimes the ask is just collecting something that never ends up being useful but it needs to be there because someone wants it in there because, you know, we're trying to recreate society so I can click on it." (P19)

In this section, we examine the work involved in negotiating practices around data structure, or how to decide, and who decides, how membership data is represented. This includes what data is collected and kept and what is gathered systematically versus what ought to be recorded in unstructured notes. Databases allow data to be gathered in structured ways that can be adapted to meet the needs of the local organizing context, but also cultivate capacity to collect too much. Our interviews demonstrate that union organizers have no consensus about how to approach the structuring of union data because of the trade-offs between these approaches.

Collecting more, but also more messy, data allows a field organizer to potentially have more insights about the workplace, facilitating more meaningful interactions with union members:

> "[A]t the end of the day I could have one conversation and it was amazing, and while I set certain qualitative goals like 'have a really great organizing conversation with people who work front desk' if I don't have numbers, if I'm not able to track over time like 'oh I'm always able to speak with people at this hour in the day'–without neat data practices it became more about presence, showing [workers] that 'oh the union's here' but I'm not the union, the [workers] are the union." (P23)

In this example, the organizer compares her experiences working for two unions, one with more rigorous data practices than the other. She connects the practice of consistently logging worker locations and time to her ability to have targeted organizing conversations, where she could check in and motivate members to take assignments, with empowering the members to participate in union organizing. Taking rigorous notes is also sometimes framed as a way to help future organizers, acknowledging both the potential for activist burnout and or-

ganizer turnover (*e.g.* "What does the person coming after you need to know?" (P21)):

> "Something that my first bosses that I had used to say, which is a little morbid, but I remember it fondly now, he used to say 'your notes should be so good that if you were in a ditch, and couldn't come back to work, if you were run off the road and were in a ditch, somebody else could pick up your turf and run with it.'" (P23)

Yet other organizers saw the same rigorous data that could be used to empower members and assist future organizers as information that may not be relevant, or potentially harmful. Organizers worried that detailed notes could unduly bias an organizer and hinder the forming of an authentic connection with the person they were organizing (P18). Additionally, taking more limited and strategic data could protect the privacy of the union members and avoid awkward situations if members saw data about themselves in the future:

> "I'm very judicious with what I decide to write in the notes sections of any data thing. I usually say 'may not support' or 'may' because ultimately I've had people who were anti-union that have really come around. We had someone who was circulating a [union] de-certification petition... who is on the bargaining committee now... So I could have put 'scab' and 'do not talk to' but eventually she's going to see it." (P7)

Organizers were also aware of how robust data gathering increased the liability of sharing data with union membership. The systems preserved data over time (some systems deliberately make it difficult to fully remove prior assessments to protect data integrity) so data access required union staff to trust activists not to "go look everything up" (P17).

Aside from negotiating the quantity of data collected, organizers also must negotiate the types of data being collected and how they are represented in the database. These questions were deeply tied to union strategy and what would guide work effectively on the ground. For example, when data structures change frequently, it makes it difficult to compare data collected longitudinally. Therefore, organizers felt every change in data structure should be made only with respect to larger strategy. For example, making a reoccurring information that is only documented in a miscellaneous "notes" into a structured category in the database becomes a question of whether you want to systematically organize people by that issue (*e.g.* are they parents? do they go to a certain church?).

Field organizers also expressed concern that particular representations of member data poorly capture the levels of support they were seeing on the ground. Each "ask" or data-gathering event is a way to test members' support for the union. If the ask is poorly suited to the local context, the assessment is not going to reflect potential members' realistic support and interest:

> "[W]hen we were going into the strike last year, [my manager] was really obsessing about my ability to assess each member, signatures on petitions and things like that. We had 90% participation in the last strike and they wanted to go on strike again, but this petition did not get to like, 80%. So [my manager asked], 'how can we go on strike again if the petition doesn't even get 80%?' and I said, 'well, we do what we just did. We organize a strike.' These [workers] just marched around the whole town. They wanted a rally or an event, and we came at them with this petition, and I don't think that was what they wanted." (P7)

Here the organizer communicates that the form of data that his supervisor was using to represent the members' support for the strike–whether or not they signed the petition–did not accurately capture their true support for the strike because it was mismatched to the action that the members wanted to do (a petition instead of a rally or event to publicize their intent to strike).

Because data collection and organization was central to organizers' efforts to mobilize on the ground, they had a stake in how data was structured. However, as we will see in the next section, they were not always empowered to change the structure of data in union data tools. When it was not possible to change the representation of the data, organizers created workarounds in the systems they used. Sometimes they made use of what they were allowed to change in the database (*e.g.* making an "event" column in the database to collect something that was not attending event) or, more often relying on their own records (e.g., "a proliferation of Google sheets") to create more useful versions of the central database. The organizer would then have to maintain multiple records, manually mediating the import and export of union data. Organizers who used Google sheets as a central database found this creates additional work of maintaining consistency:

> "At first the main reasons we were worried about it were security, which obviously we were concerned but over time the issue has just become consistency... week to week you can check in with the other organizers to see what did we do this week, and is it recorded, and the different places it would need to be recorded so we don't have data loss." (P14)

Again, the initially appealing flexibility of the workaround system was functionally constrained by the need to maintain organizational accountability:

> "[B]ut the other thing, when you change the way that the data is recorded and viewed, it also changes your expectations. Not so much for me, but for my supervisor, our regional director, who has become accustomed to now being able to look at these different places to see similar types of information. So for example, she may want to pull something up and see it at the bird's eye level on a spreadsheet that covers a summative analysis of the different leads and perspective campaigns, and then drill down by clicking on a link to see it at a [workplace] level. so you become used to looking at things.. so even though it's a mess right now, it's a mess you know your way around." (P14)

Since the workaround had become a means for sharing data across different levels of the union, P14 not only shoulders

the burden of preventing data loss, but is also accountable to produce data in the way it was anticipated by his supervisor. Preserving the dysfunctional but familiar structure in turn limits how much further calibration can be done.

Data Temporality and Discretion

> "As an organizer myself, I don't have backend access so I can't even restructure the [database] to make it a better data collection tool. It has to be sent up through a chain to tech people on high, who are seriously overwhelmed by the amount of stuff they have to do so it's hit or miss what help you get." (P13)

> "There is a way in [the database] to have the main screen open as the assessments came in, it just refreshes, and you can see them live and so you can keep checking." (P3)

As described in the previous two sections, field organizers engage in significant work negotiating and working around issues with data access and data structure. Their work to make data work in organizing was complicated by the unique temporality of networked data tools: field-level organizers found the tools "slow" in their functioning and their ability to adapt to local context, and simultaneously "fast" in their ability to report data to different levels of the organization.

Working with data tools was slow in the sense that in order for data to reflect realities on the ground, organizers sometimes needed changes in the structure of a common database. Encoding data structure digitally *i.e.* as a set of columns in the database, introduces implementation lag and administrative work. The lag issue was a major issue in our interviews, as most organizers relayed stories about wanting something changed in the customized the database. The organizers' requests would go through the union's organizational structure to be implemented–or not implemented–by a technician:

> "There was a guy... who was national level [data technician]. Normally what would happen is that anything that had to be bulk uploaded or any changes to the data architecture, I would be consulted, most of the time, and I would often produce things but then the file would leave my hands." (P5)

Sometimes the "data guy" would travel to the local union to understand how data was being used by the field organizers. Other times, the organizers were given a database created from a template and the local calibration occurred through a series of phone calls and email exchanges. Whether the changes were implemented in a timely way, or at all, had to do with how local needs were prioritized at state or national level. Necessary decisions about how to allocate technical expertise meant that sometimes organizers had to "fend for themselves" (P14).

Organizers who experienced implementation lag were very aware of the lack of on-site technical expertise, sometimes wondering whether there ought to be someone more local with permissions to reconfigure data:

> "I get that you wouldn't want to have just anyone in the database to be able to change or add any fields because it becomes kinda meaningless and you can't compare across different organizers' turfs if everyone is using different fields. So you need someone mediating and ensuring that there's consistency. I always thought that should be someone a little bit closer to the campaign. Either in my position, or immediately above me. Because the way it did work was that the people who had access to do that were data people, who didn't necessarily know what was going on in the campaign. So it was always kind of a struggle to get them to understand why we needed this or that." (P18)

As the data tools lagged in capturing the local contexts, networked data entry allowed apparently instantaneous monitoring of the activity of field organizers by their supervisors:

> "We'd be given a lot of flexibility and autonomy in terms of, here's your map, here's your turf list, come back tomorrow morning at debrief. So we had the rest of the day and the evening without any other tracking except that we'd be putting assessments into the database, sort of somewhat-regularly.... We'd have to track if someone wasn't home. Enter in assessment 'not home' and then the lead organizer can see that you made 30 attempts that night. and I would sometimes get calls like, I would be on the doors, and I would write a note into the database, and then I'd be driving and then I'd get a call from the lead organizer and they'd be like '[P12], that note you just put in, tell me about that conversation.'" (P12)

While this organizer felt uncomfortable about how his lead organizer was "clearly sit[ting] over the database, behind his laptop, while we were at field, and watch[ing] the assessments pour in," he also noted that his supervisor was calling to consult with him meaningfully about what he just saw ("it was more like, a supportive or inquisitive call"). This was not always the case. For another organizer, the same in-the-moment logging of organizing details that are available to management contributed to a feeling of being both watched and disregarded:

> "They want to know that they could highly monitor me but they don't monitor me. They track everything that I do, but nothing is actually looked at, that I write." (P7)

These two aspects of temporality interact. While field-level organizers (and lead organizers, if their work also involved going in the field) who worked closely with the membership experienced implementation lag in getting the data representations to align with what they were seeing on the ground, their supervisors, who operated a at a distance, interacted with the same data as an apparently in-the-moment reflection of the organizer's work:

> "[I]t's the only hard metric, so my bosses will frequently check my data entry to see if I've been working. And they'll like, watch the dashboard to see how it's changed... one of my bosses is obsessed with the percent on member cards, and they really dig in to that."(P7)

The descriptions of organizers' experience highlights how the tools are apparently slow—slow to change, slow to navigate and work around—and, simultaneously, almost instant

in their ability to communicate detailed information from the field to people looking on from a distance. One consequence of this networked representation, compared to paper or non-networked representation, is that the most current data being gathered ceases to be in the sole purview of the organizer from the moment that it is entered into the system.

This shift in data temporality has the potential to reshape the union's relationship to data at different stages of organizing. Earlier we described the role of one-on-one debriefs between organizers and activists as a means to negotiate assessments of membership support. Similar debriefs also occur between field organizers and lead organizers. These meetings provide an opportunity to get the context for an assessment, or in the words of an organizer who also worked as a lead, to "mediat[e] between cold hard data and the experiences of the organizers and the people who it needs to be reported to" (P18). In situations when the most up-to-date numbers needed to be shared with leads, the debrief meeting potentially consists of both "reporting" (*e.g.* sharing one's numbers) and discussions about strategy and planning that emerge out of the field organizers' reporting the data.

However, since networked data collection removes the need for reporting (since the tool allows the supervisor to monitor incoming data without debriefing with the field organizer), the functional purpose of debriefing may change, since it reduces the chances that the field organizer will be understood as communicating organizationally-valuable, unique knowledge. At the same time, from our interviews, we learned that debriefs can take very different stances on the value of an organizer's perspective, regardless of the data systems being used. Even when one organizer was reporting numbers from paper, her corresponding perspectives on strategy were dismissed as "overintellectualizing her job"(P13). Conversely, it is possible to have the lead organizer "pull reports from the database and do personal check-ins" (P6) (*i.e.* to debrief with field organizers even while having the most current numbers). This suggests that the use of networked tools does not in itself decrease the field organizer's ability to affect strategy. But in situations where the field organizer's perspective is already being disregarded, the tool potentially compound the lack of discretion by diminishing the opportunity for the organizer to communicate the data's context while giving the supervisor immediate, remote access to apparently robust data logged by the organizer in the field.

DISCUSSION

Our results make clear that underneath questions around data collection, access, structure, accuracy, and use lurk bigger questions about the role that field organizers play in informing and shaping union strategy. The answers to these questions are based not simply on the properties of networked data tools but on how they refract with organizational hierarchies and power dynamics that characterize organizing work. As our results suggest, the affordances of networked data tools can decrease discretion in campaign decision-making at the level of the field-organizer. In our discussion, we return to the distinction between 'top-down' and 'bottom-up models' of union organization mentioned in the introduction: in the top-down model, central union staff set strategy and mobilize union membership; in the bottom-up model, union members mobilize themselves with the support of union staff [40, 41]. First, we discuss how top-down organizational approaches can systematically degrade the quality of data collected. Next, we describe an approach for using data tools in a more bottom-up manner.

Data-driven from the top down

Field-level organizers are on the boundary between the union membership at the "bottom" and union's strategy and resources at the "top", sometimes finding themselves in situations where they have to choose between "achiev[ing] the goals" and "alienat[ing] the turf" (P17). This puts them in a unique position to see mismatches between the data being gathered and situation on the ground. But their ability to account for mismatches is limited not only by the data tools, but also by their role in the organization. Our results indicate that the degree to which local union leadership value feedback from field-level organizers varies across different campaigns. Structurally, however, the tools have the potential to diminish opportunities for feedback to take place at all by centralizing immediate, robust representations of the field. Especially if the field organizer is including detailed notes, the supervisor may believe that they already understand the context of the data without discussing it with the organizer.

Organizers saw these tools as having real potential to reveal patterns and new opportunities to organize the workers. This potential was not always realized, because, as detailed in our results, changes to system access permissions or data structure had to be be funneled through the top: the "data guy," a technical resource operating from afar. In one situation, an organizer pushed the lead to include a dedicated column in the database to track worker issues in a systematic way with the goal of organizing workers around those issues, but the change was never implemented. It had to go up the hierarchy to get to the data experts, but to get there, it first had to get to the campaign director, which was risky given organizational tensions in that campaign. According to her account, pushing for this change got the organizer in trouble with her supervisor and the only reason she was not fired from her job was because she had made herself "indispensable" to the campaign.

This story highlights a double bind for field organizers in producing accurate data. In order to improve data (*e.g.* by recommending new categories, or removing ones that alienate membership), organizers must risk pushing against organizational hierarchies to contribute their contextual knowledge. But the more they generate accurate, immediate representations of their context, the more dispensable they become and the riskier it becomes to push back. As a result, more "robust" data gathering may actually create fewer opportunities for the data or strategy to be corrected and thus result in poorer understanding of members.

Data-driven from the bottom up

The question this dilemma raises is whether it is possible to shift sensibilities in using networked data tools to a more bottom-up approach. The perspectives of field organizers

suggests first that data tools play an important role in union organizing. While organizers described ways that the data they gathered failed to tell the whole story, or expressed skepticism about the impact of data tools, the organizers we interviewed overwhelmingly thought the tools were necessary. They believed that the ones they had were usually, but not always, better than experienced or imagined past alternatives. Even with their administrative burdens and imperfect implementation, the tools "worked" because they consolidated data. This data helped organizers and member activists track their progress toward a campaign, which is necessary for them as an organization that needs to reach a majority to accomplish their goals.

The question then is what needs to shift for these tools to better support bottom-up organizing between member activists and field organizers. Our results suggest that issues of access and structure, compounded by implementation lag and organizational scrutiny, made it difficult for staff organizers to confer the same level of organizational knowledge to the member activists they worked alongside. But another barrier was simply that the data tools were not being used to develop or assess activist leadership. Because the priority of the campaign was to assess individual worker support, the organizers we interviewed were being sent out to assess, or delegate the assessment of individuals. These assessments of support were based on specific actions – wearing a sticker, signing a petition, posing for a photo; in contrast, there was little emphasis on assessing a member's leadership based on their efficacy in organizing their colleagues. An alternative approach to assessing membership could be to evaluate worker "structure," *i.e.* the ability of individual workers to convince their co-workers to participate in actions [41]. Mapping these chains of member participation could be accomplished using tools similar the the ones currently in use. The meaningful difference is in the organizational practices needed to support this kind of data gathering. The task of assessing individual union support can be implemented by staff organizers, but structure test relies more substantially on developing activist leaders and meaningful member participation.

IMPLICATIONS AND FUTURE WORK

Our results suggest one possible direction for future technical system design, which is to design data tools that anticipate workaround data practices. Such tools should support the exporting and importing of structured data and put design effort toward supporting cases where local versions of the data may not be in the exact same format as the central database. More generally, this means that in addition to facilitating normal client-side data entry, user experience resources could support structured data migration (*e.g.* excel or csv files) on the 'front end.' Aside from this, our results signal that that there are few easy technical solutions to solving problems of union strategy. In part this is because members of the union's organization must negotiate these decisions together. Our results also caution about the costs of replacing data systems with versions hoped to be better, because replacing data tools places additional administrative burdens on union staff. Especially in situations where there is no clear design fix, it may be more practical to strain out the smaller usability issues in the existing tools than to replace them with newly conceived ones.

A broader implication of our research is that labor unions may be more effective in understanding their membership by reorganizing their technical resources. While it is necessary for many questions of data access and structure to be resolved in groups involving levels of the unions' organization, it is possible that some of the technical implementation could happen not in national and state offices, but in union locals. The need for technical expertise to calibrate data access and structures could also be addressed by training field and lead organizers in basic data systems modification.

Finally, if the way forward for improved data practices is reconsidering how data decision-making happens, then more research is needed to understand the organizational relationships described in our interviews. What factors, outside of having organizationally-valuable knowledge, shape the experience of field-level organizers? Here, it could be useful to revisit the question of building trades unions, and the organizational differences between staffers in building trades and service and professional workers unions. Our results show how organizational dynamics, combined with the temporal affordances of data tools, can distort data by systematically preventing opportunities for feedback and calibration. This suggests that further research into the experience of field-level organizers can inform our understanding of data practices in forms of organizationally-complex work in other domains.

CONCLUSION

In this paper we describe how networked data management systems impact the on-the-ground experiences of organizers and what work they must do to actually make the data useful for the union and their own work as organizers. We have described how field organizers negotiate differential levels of data access and calibrate representations of the data to different levels of the union's organization. We have also shown how organizer's ability to do these things is potentially impacted by the use of networked data tools, because the tools introduce implementation lag and change the way knowledge is exchanged within the organization, limiting the unique knowledge the field level organizer can leverage in making recommendations. We discuss how the use of these tools constrains the organizer's ability to efficiently share membership data with activists, potentially hindering data gathering and member activist leadership development. We make recommendations for improvements to the design of systems–to anticipate and support data workarounds through better front-end data migration–and to the role and distribution of technical expertise within the labor union's organization structure.

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