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RESEARCH-ARTICLE

Integrating Equity in Public Sector Data-Driven Decision Making: Exploring the Desired Futures of Underserved Stakeholders

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Public sector agencies aim to innovate not just for efficiency but also to enhance equity. Despite the growing adoption of data-driven decision-making systems in the public sector, efforts to integrate equity as a primary goal often fall short. This typically arises from inadequate early-stage involvement of underserved stakeholders and prevalent misunderstandings concerning the authentic meaning of equity from these stakeholders' perspectives. Our research seeks to address this gap by actively involving undersevered stakeholders in the process of envisioning the integration of equity within public sector data-driven decisions, particularly in the context of a building department in a Northeastern mid-sized U.S. city. Applying a speed dating method with storyboards, we explore diverse equity-centric futures within the realm of local business development, a domain where small businesses, particularly women-and minority-owned businesses, historically confront inequitable distribution of public services. We explored three essential aspects of equity: monitoring equity, resource allocation prioritization, as well as information and equity. Our findings illuminate the complexities of integrating equity into data-driven decisions, offering nuanced insights about the needs of stakeholders. We found that attempts to monitor and incorporate equity goals into public sector decision-making can unexpectedly backfire, inadvertently sparking community apprehension and potentially exacerbating existing inequities. Small business owners, including those identifying as women-and minority-owned, advocated against the use of demographic-based data in equity-focused data-driven decision-making in the public sector, instead emphasizing factors such as community needs, application complexity, and uncertainties inherent in small businesses. Drawing from these insights, we propose design implications to assist designers of public sector data-driven decision-making systems to better accommodate equity considerations.

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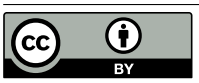

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1 Introduction

When city or state agencies innovate their services, their goals extend beyond service equality and efficiency; they often strive to enhance equity and fairness [9, 80, 152, 165]. Unlike equality, where everyone receives the same resources, equity acknowledges the disparities in starting positions and calls for the distribution of resources based on individual needs [76, 83, 94, 117]. For example, public transit services offer priority seating for seniors and people with disabilities [106], and some services offer reduced fares or even free access for marginalized groups [3]. These services do not generate more profit nor make the transit service more efficient. However, they improve the transit service by making it more accessible to all citizens. This focus on equity differs from commercial innovation, which often evaluates success based on profit or proxies for profit, such as increased sales, usage, efficiency, or cost reductions [111, 150]. Equity as an explicit goal makes public service innovation an interesting space for HCI research on fairness and responsible AI.

The public sector has increasingly begun adopting data-driven decision-making systems to enhance offerings [4, 6, 14, 23, 33, 38, 47, 52, 70, 73, 85, 97, 107, 129, 147, 149, 150, 152]. Data-driven decision-making systems are defined as systems that utilize facts, metrics, and insights to guide strategic decisions that align with an organization's goals, strategies, and initiatives [133]. However, recent research has shown that data-driven decision-making systems in public sector agencies can cause unintended harm to already vulnerable populations. For example, systems meant to create more efficiently distributed child welfare resources treated citizens differently based on race [37, 57]. Other systems took back benefits from under-resourced, working-class citizens [5, 11].

To mitigate such challenges, recent years have witnessed some efforts by the research communities and public sector agencies to incorporate equity as a goal into the design of data-driven decision-making. However, the inadequate early involvement of affected stakeholders and the complexities of real-world challenges have hindered the realization of these goals [38, 92, 131, 140, 169]. For instance, San Francisco's public schools implemented a system to assign students to schools more equitably, deviating from the traditional neighborhood school enrollment approach. Yet, the system was not accepted and embraced by impacted community members it was meant to benefit. The design did not holistically consider the stakeholders' needs and values in integrating equity. For example, the school assignment system prioritized individual students, neglecting the importance of a child's social ties to their neighborhood peers [140]. Another example is the child-welfare screening tool. To address the racial disparity and accuracy in screening rates, researchers made significant efforts to design fairness constraints and developed models that are subject to these constraints [38]. However, a recent workshop study revealed that affected families and social workers question the fundamental assumption of designing and using machine learning-based predictive tools in child welfare. Instead, they advocated for low-tech and no-tech alternatives, as well as policy innovations that prioritize community empowerment and tackle the underlying issues more effectively [158].

Our project explores how we can engage the impacted stakeholders in envisioning the integration of equity prior to designing a data-driven decision making system. We utilized speed dating with

storyboards [42, 177] to explore a wide range of potential futures and probe stakeholders' fears and desires about equity [50, 101, 102, 174]. We delve into the realm of local business development, where small local business owners often encounter inequitable experiences in the distribution of public services [27, 64]. Our specific focus centers on the building department of a Northeastern mid-sized U.S. city, which is responsible for permit issuance, inspections, and ensuring urban development safety. Given that this department is in its initial stages of developing data-driven decision-making systems, it presents an opportune moment to consider the integration of equitable data-driven decisions. Our study concentrates on exploring the perspectives of small business owners, particularly women and minority business owners, as prior literature highlights them as the most vulnerable stakeholders affected by the decisions of building departments across the country [17, 142]. Drawing on existing literature and exploratory discussions with a range of stakeholders - encompassing the building department, small business owners, community representatives, architects, and developers - we constructed forward-looking storyboards. These storyboards investigate three key themes (monitoring equity, prioritization of resource allocation, information and equity) as integral parts of potential future scenarios in integrating equity in the work of the building department.

Our work contributes a deeper understanding of the complexities of integrating equity into data-driven decision-making in the local building department by highlighting the varying desires and needs of small business owners, especially women and minority owners. Our analysis offers the following insights:

- Complexities of Monitoring Equity. Participants argued that attempts to monitor equity and pinpoint unfair practices within the public sector could, paradoxically, intensify existing disparities, especially when such efforts involve the collection of disaggregated data by the public sector. At the same time, participants recognized the value of demographic-based analysis in public service delivery. They held the view that such analysis could validate the struggles encountered by minority business owners, hold the public sector accountable for inequitable public service delivery, and potentially bolster public support for women- and minority-owned businesses.

- Prioritization of Resource Allocation. As business owners, including those who identified their businesses as women- and minority-owned, contemplated future designs for incorporating equity into data-driven decision-making in the public sector, they rejected the notion that their identities should grant them advantages or primarily drive such initiatives. Instead, they pointed to various other factors that should influence equity-driven efforts, such as community and neighborhood needs, the complexity of the application process, and the precarity and uncertainty that small businesses face, wherein unexpected delays could have dire consequences.

- Information and Equity. We probed about public sector providing information to support small business owners. Participants expressed doubts on the usefulness and reliability of the information provided by the public sector, even though it is intended to improve equity. Despite these doubts, participants shared third-party ratings and social network as means for gathering information.

Based on our findings, we offer implications for designers of public sector data-driven decisions to consider when integrating equity in public services. We highlight how lack of trust towards the public sector presents challenges of monitoring equity, especially when collecting demographic-based data is crucial for detailed equity evaluations. In response, we propose third-party auditing

and community-based data sharing practices as means to overcome these barriers of collecting demographic-based data. We explore the complexities of embedding equity in data-driven decision-making and suggest the use of speed dating as a method to navigate such complexities. Finally, we reflect on the role of data-driven decision-making in advancing equity.

2 Related Work

2.1 Fairness, Equality, and Equity

There is a growing literature in the CSCW and HCI community, exploring perceptions of fairness in context-specific scenarios [36, 37, 93, 151], social justice [53, 59, 60] or equity [95, 115, 135, 155]. For the scope of this paper, we focus on two ways of categorizing how fairness is operationalized: equality-based fairness and equity-based fairness [94].

Equality ensures that everyone receives the same resources regardless of differences in circumstances. In the context of machine learning-based or algorithmic systems, the most common approach is to translate equality notions into formal algorithmic constraints and develop algorithms subject to such constraints [91]. For example, group fairness requires parity of some statistical measure (e.g., prediction rates, accuracy, or false positive/negative rates) across a fixed number of protected groups (e.g., different racial, gender groups). However, the equality-based approach has important drawbacks. To illustrate these drawbacks, we use the classic illustration of three children trying to watch a soccer match over a wooden fence — the tallest can see, but the others cannot see. If all three children are given a box to stand on, the tallest child was able to see without a box but now has one regardless, the very shortest still cannot see while standing on a single box, and the child who uses a wheelchair is unable to use a box as it is not an appropriate resource [8].

In contrast, equity recognizes that everyone receives the resources and opportunities they need in order to be successful. There is a recognition that the ground is not level and due to historical patterns of resource inequality, not everyone starts from the same position. Equity helps to consider how to distribute resources across society, and how resources should be distributed to ensure fair treatment [76, 83, 117]. Additionally, equity ensures that those who are disadvantaged receive the most benefits, ensuring that the distribution of resources are balanced [32]. In the illustration of the soccer match, the tallest child does not need an additional resource to see, the smallest child needs two boxes to stand on, and the child who uses a wheelchair requires a ramp and a platform to see over the fence. Prioritizing needs-based allocation, HCI scholars have investigated equity in diverse contexts such as health [67], gender [164], and education [155]. For example, Quinonero et al. investigated equitable algorithmic decision-making in a job application platform, considering the applicants' historical barriers or demographic features [135]. Researchers have developed interventions to advance equity in the form of frameworks [30, 79, 95, 118, 135, 160], technologies [115, 120] or participatory design [75, 99, 159].

The notion of equity has its roots in Greek philosopher Aristotle's conceptualizations of legal justice, in which he articulated that equitable decisions are made when rewards are provided in proportion to merit [18]. Aristotle's concept of equity aligns with *equity theory*, originated from organization and behavioral psychology research, which measures the ratio between an individual's contribution and merit [2, 132, 167]. An equitable decision means that this ratio is equal across different individuals. Scholars have applied *equity theory* in contexts such as shift scheduling systems for healthcare workers [162], and payments for crowd workers [46].

Public administration scholars shared that there is no universal definition of equity, where some scholars attribute equity as access to services and others may assess equity as fair distribution of services across different social groups [32, 144]. This divergence is exemplified by the U.S. National Academy of Public Administration, which defined equity into four dimensions: equal

access to resources, procedural fairness, consistency of the public service quality and the impact across different social groups and individuals [119, 144]. Consequently, advancing equity in public services requires thoughtful considerations as to what factors should be considered when creating equitable outcomes. For example, in the context of public housing allocations, county department considers criteria such as emergency department visits, jail booking frequency, and mental health conditions [40].

Moreover, the influence of public service employees' discretion on uneven service delivery is significant [109], where politics and the desires of elected public officials impact service delivery [64]. For example, in Sweden, town officials discovered a snow-clearing schedule that disproportionately affected women due to unrecognized travel patterns based on gendered roles in society. This incident surfaced the need for gender-specific disaggregated data to re-evaluate public policies and address inequities in public services [128]. Efforts to highlight inequitable distribution of public services have long been a feature of urban studies, whether in transportation [27], public safety [65], or utilities [113]. Our work extends existing literature exploring the integration of equity in a municipal building department from the perspective of small businesses.

2.2 Public Sector Data-Driven Decision-Making

In recent years, CSCW has investigated the growing adoption of data-driven decision-making in diverse public sector domains such as unemployment [152], housing allocation [85], social welfare [23, 73], and child-welfare [129, 149, 150]. Prior CSCW research investigated the impact of both automated [6, 33, 129, 149, 150, 152] and non-automated data practices [23, 47, 52, 73, 85], uncovering themes such as understanding the perceptions of data-driven decision-making tools by caseworkers. For example, Chau et al. explored how algorithmic systems shaped professionals' work practices when interacting with clients [33]. Researchers explored public sector data practices transforming the interactions and relationships between caseworkers and residents [47, 73]. Dickinson et al. investigated that underserved community member perceived data-driven apporaches to civic technologies as transactional.

Researchers have expressed concerns of data-driven decisions' unintended negative consequences that exacerbate existing inequities [5, 11, 19, 37, 54, 57]. Scholars found that risk assessment tools used in the criminal justice system discriminated against black defendants [11, 54]. In child-welfare, critics argued that these systems created discriminatory and inaccurate decisions when predicting whether a child should be removed from their home in the future [57]. In response, a growing body of work has investigated fairness criteria and constraints for these public sector data-driven decisions [5, 25, 26, 37, 78, 166]. More specifically, HCI researchers have been engaging with impacted stakeholders to gain better insights on needs and how to mitigate bias in existing public sector data-driven decisions [37, 88, 93, 140]. For example, Cheng et al. proposed a framework that elicits stakeholders' subjective fairness notions [37]. Lee et al. investigated different perceptions of fairness based on how resources are allocated and donated within the context of non-profit organizations [94].

With such an interest in fairness, scholars have investigated public sector data-driven decisions that specifically consider equity as an embedded value and a goal in the design [22, 92, 125, 140, 153, 169]. Robertson et al. investigated San Francisco school assignment algorithms which failed to consider families' real needs, priorities and goals when considering the modeling assumptions, especially around the perceptions on what is equitable [140]. Within the context of the Housing Allocation Algorithm, researchers found that the system was used to reflect the county's values, not the community members' needs [92].

Despite discussions of engaging with impacted stakeholders, there has been a lack of attention to engagement with those who are most impacted by public sector data-driven decisions in the early

stages of deciding how to integrate equity. Many researchers have investigated such fairness criteria and evaluations engaging with impacted stakeholders in already existing and deployed systems in the public sector. Within such contexts, researchers found that impacted stakeholders' real needs and desires were insufficiently reflected in these decisions [92, 158]. For example, Stapleton et al. found that impacted communities, specifically parents, of child welfare systems suggested low-tech and no-tech alternatives to data-driven decisions to better address the existing problems to the child-welfare systems [158]. Simply removing a deployed algorithm does not fix the challenges; researchers found that it is difficult to undo or mitigate the impact that algorithms have already inflicted upon society and stakeholders [55]. Such findings indicated the need for involving impacted stakeholders in the early stages — *before* systems are deployed and harmful impacts are made [140].

2.3 Engagement with Stakeholders at Early Stages

Prior HCI researchers have studied various methods of direct stakeholder engagement in the early stages of designing technologies, using participatory design [51, 156], Co-Design [24, 87], Value Sensitive Design [61]. Engaging with stakeholders in the early stages of the design process unveils hidden desires that have yet to be surfaced [41, 72, 86, 95, 154]. Delgado et al. outlined five dimensions of participation ("why is participation needed, what is on the table, which stakeholders should be involved, what form should the participation take, how is power distributed among stakeholders") for AI practitioners and researchers to use when involving stakeholders in the AI design process [45]. Similarly, Reynante et al. created an Open Civic Design framework that addresses levels of stakeholder involvement based on different design phases to develop a meaningful and accessible public engagement [139]. Yoo et al. conducted a speed dating study to better understand the intersection of the stakeholders' needs and desires in the design of transit service [174]. Zhu et al. suggested a value-sensitive algorithm design that incorporates stakeholders' implicit knowledge and direct feedback in the initial stages of algorithm development. Such proposal aimed to reduce biases when making design choices and safeguard key stakeholders' values [176].

Within the context of public sector technologies, a call for active participation and citizen engagement has been discussed to address local challenges and provide structured solutions. Katell et al. developed a toolkit aimed to co-create algorithmic accountability interventions with communities with the goal of incorporating racial equities in surveillance technologies [86]. Despite efforts to engage with impacted stakeholders, integrating equity in the public sector still remains a challenge. Researchers found conflicting views among stakeholders on how to prioritize resource allocations and deciding what factors to consider for equitable decision-making. Lee et al. described that impacted stakeholders had challenges deciding which factors to consider when prioritizing resource allocation in the context of donating food [94]. Additionally, public sector technologies are often procured by private companies that lack comprehensive and sophisticated understanding of impacted stakeholders' needs [97, 100].

Our work builds upon these existing efforts to involve impacted stakeholders in the early stages of the design process. The complexities around integrating equity highlight the need to surface implicit desires and fears of those who are impacted by equity-based data-driven decisions. While there already exist methods to negotiate important values among stakeholders when developing technologies [66, 154], our work is situated in a context where the complexity of integrating equity creates a discussion of not knowing which problem is worth addressing and triggering for these impacted stakeholders. To expedite and broaden our understanding of these concerns, we employ a speed dating approach [177]. This technique provides a swift and efficient opportunity to investigate the diverse future of integrating equity and observe stakeholder reactions towards each scenario.

3 Background

This study is part of a larger study that looks at the building department of a Northeastern mid-sized U.S. city (hereafter, the "City") and its many stakeholders as an opportunity to incorporate equity into the department's data-driven decision-making. In this section, we provide details on the building department's role in the City, motivational anecdotes for this study, and the emergence of data-driven decision-making in U.S. building departments, including the City's building department.

3.1 Role and Impact of the Building Department

The City's building department provides a wide range of services, including keeping the built environment safe (enforcing building codes and zoning regulations, issuing permits, and business licenses). For commercial building permits, the user base includes City residents (those attempting to open up commercial enterprises locally) and non-residents (corporations, developers). In addition to ensuring the safety of the built environment, the building department's activities have an impact on social issues such as gentrification and inequitable urban development [126, 143]. Decisions that involve building demolition applications may significantly impact neighborhood qualities, especially those in low-income areas.

Business owners may also potentially contribute to neighborhood quality through economic growth, safety, and maintenance of the City [58, 82]. To open a business, the business must submit permit applications to ensure that building code requirements are met in the construction process. In a typical workflow, the applicant (e.g., business owner, contractor, or architect of the construction) would submit a permit application. Once the department receives the permit, an in-person inspection is conducted by certified inspectors to evaluate whether the built objects comply with the building code. Inspectors determine compliance based on their interpretation of the building code. If an inspection fails, the applicant must revise the construction and schedule another inspection. When all inspections are performed, the permits will close out [123].

3.2 Motivating Anecdotes: The Contributions and Challenges of Small Businesses

In this paper, we focus on small businesses, vital actors in the creation of a livable community environment. We define a small business as an "independent business having fewer than 500 employees" that are not dominant in their field of operations, a definition provided by the U.S. Small Business Administration [121]. Through their contributions, small businesses construct a lively network of resources and relationships, serving as cornerstones of their neighborhoods. Whether it's the convenience of a corner store down the street, the familiar aroma from a local bakery, or the conviviality of neighborhood restaurants and bars, their presence enhances the sense of unity and shared bonds within the community.

However, these crucial community builders are operating within an urbanism landscape that has long grappled with significant challenges. Historical marginalization and inequitable distribution of public services have burdened small businesses and the communities they serve [27, 64]. Jane Jacobs and other proponents of new urbanism have critiqued these challenges, pointing to the disruptive urban revitalization efforts of the 1960s that resulted in displacement, racial segregation, and uneven spatial distribution of municipal services and resources [39, 82]. In addition, challenges such as barriers to entry, fewer resources and accessing necessary capital, competition with larger corporations influence the success of these small businesses [17, 142]. Similarly, women-and minority-owned business owners have struggled due to lack of experiences and resources originated from historical gender and racial discrimination as well as stereotypes that hampered opportunities of growth and education [81, 89].

We observed such challenges in the City manifested in a series of accounts from local residents and small business owners about potential inequitable practices within the building department. For example, in early 2020, a newlywed couple set out to open a coffee shop in *a bit of a forgotten neighborhood.* It took them months to get their occupancy permit approved. A few days before opening their business, they were informed of a mistake in their materials, causing the permit to be denied. Frustrated by their perceived lack of transparency in the application process, they contacted their city council person to intercede [130]. In another story, for a year and a half, a young businesswoman worked to get an occupancy permit for a bakery. She spent her life savings to make several expensive modifications to meet building codes. Eventually, the cost of maintaining the building for a non-functional business and bringing the space up to code caused her business to fail before a single baked goods could be prepared and sold.

In an attempt to deliver more even service delivery to constituents, the City's building department has started to make a major push to advance its data infrastructure and service delivery through data-driven decision-making. Below, we describe the nature of such efforts, and how our research aims to contribute to more equitable data-driven decision-making.

3.3 Building Department Data-Driven Decision-Making

Public sector agencies have been harnessing data through platforms such as e-government websites and census bureau to create data-driven decisions and develop "neutral, scientific and objective techniques for analyzing situations" (Levy et al. p.5) [97]. Such practices create opportunities for evidence-based policies and services that make cities sustainable [43, 90]. Building departments are no exception. With their long history in the U.S. administering building permits since 1889, such data were collected to understand the use of construction materials in urban areas [29]. With the abundance of past data and new data, collected through digital interfaces that interact with citizens, building departments across the U.S. have developed interactive dashboards and analysis that provide insights into cities' built environments. Examples of such analysis include reports of the constructions across cities, and areas that violate safety regulations [122].

In our conversation with the City's building department, we learned that the department has been conducting data analysis to track its performance, and inspect neighborhoods with high inspection fail rates. These early stage efforts to utilize data when making decisions are a opportune moment to understand how public sector departments integrate equity in their work.

4 Method

We wanted to understand people's hopes and fears around how public services might leverage data-driven decision-making to improve equity. We chose to conduct a speed dating study using storyboards [42, 177] to investigate how impacted community stakeholders might feel about data-driven decision-making that behaves in new ways. Speed dating uses provocative scenarios representing various possible futures to expose social boundaries that do not yet exist. Through these scenarios, participants critically reflect on their underlying needs. The method is beneficial when designers are aware of the uncertainty on how a system should behave [42, 50, 101, 174, 177].

4.1 Developing Scenarios

We developed scenarios of service encounters between business owners and building department employees. We wanted to create a set of scenarios that broadly explored interactions with a future building department that attempts to make more equitable data-driven decisions. The goal was to provoke participants to reflect critically on how public service delivery works and how it should or should not work in the future. Our efforts aimed to envision situations that surfaced business owners' fears, anxieties, hopes, and dreams [177].

Scenario Theme	Number	Storyboards
Monitoring Equity	1.1	The building department collects project and personal information such as demographics and financial resources devoted to the project.
	1.2	Applications to the building department are made public. Everyone can see the demographic information, such as race and gender, for every business applicant.
	1.3	The building department sees data on applications' success based on the business owners' demographics.
	1.4	Public sector workers receive feedback on their performance based on applicants' demographics, possibly exposing implicit bias.
Prioritization of Resource Allocation	2.1	Public sector worker receives a financial reward if they prioritize specific applications.
	2.2	Public sector worker has the ability re-prioritize the order of the applications.
	2.3	Public sector workers can prioritize applications that have more positive impacts on a neighborhood.
	2.4	Applicants see large businesses take 2 days to get a response while small businesses take 10 days.
Information and Equity	3.1	Public sector connecting applicants and recommended experts (contractors, architects) in the city
	3.2	Building department recommends contractors and architects that have had many successful interactions with the building office.
	3.3	Building department technology estimates when the next action (inspection) will happen. The duration is long.
	3.4	Building department records and transcribes conversations during inspections. This transcript is available to the business owner, so they have evidence of what the previous inspector said.
	3.5	Interactions between politicians and specific applications in the building department's system are recorded and made public.
	3.6	Building department's system provides onscreen explanations to guide first-time applicants over common problems encountered by earlier applicants.
	3.7	Applicants make a preference whether they want high quality but delayed service or low quality but fast service.

Fig. 1. Overview of the entire set of storyboards used in the speed dating session. The first column indicates the three scenario themes explored in the study. 15 storyboards were initially created for the study.

Our process began by identifying pain points addressed through prior literature, local news articles in the City, and exploratory discussions with City employees and stakeholders who interact with the building department [89]. The stakeholders involved in the exploratory discussion included City employees who work in the building department (n=9), small business owners who had recently interacted with the building department (n=5), architects (n=2), and contractors (n=2) who often function as mediators for businesses and the building department. To help understand the friction points around urban development initiatives, we also spoke with community representatives (n=3) who do advocacy work to address issues such as gentrification. Through engaging in dialogue with these stakeholders, we formulated three scenario themes that each resulted in several storyboards for our speed dating study. Below, we illustrate how our exploratory discussions informed us to focus on the following scenario themes.

4.1.1 Scenario Theme: Monitoring Equity. Our exploratory discussions surfaced issues around identity, the experiences of first-time businesses, and the size of the businesses as important descriptors. Some business owners expressed concerns about receiving unequal services due to their race or gender. For example, some women business owners expressed befriending male experts of the permitting process as a necessary strategy to cope with perceived inequitable building department services against women-and minority-owned business owners. Moreover, public sector employees and business owners spoke of "first-time applicants" as a distinct group. They shared that a lack of experience with the City processes and limited opportunities of social

connections with permitting application experts put "first-time applicants" at a disadvantage. They also noted a distinct difference between large enterprises and small, local businesses. The business owners believed that small businesses could not easily absorb unanticipated delays which require changes to plans. They felt large businesses had enough resources to redistribute construction efforts, while a delay for small businesses might cause their construction crews to move on to other projects.

However, it was unclear whether these issues were systematic or isolated incidents, and how to effectively monitor the building department for potentially inequitable practices. In our conversation with a City councilwoman, who also expressed concerns about these challenges, one possible solution discussed was conducting an equity audit regarding the building department's practices. However, when we initiated this audit using the publicly available permitting application dataset, we found limitations of conducting such an audit. The dataset lacked necessary variables, such as applicants' demographic information and details of delays, which are necessary to determine if the building department discriminated against a specific group of applicants. This raised a broader question: *How can public sector practices be monitored for equity?*

To understand the presence and impact of potentially inequitable practices, the public sector agencies in the United States have been discussing ways to monitor equity and efforts to collect necessary data as means to achieve such goal [77]. Such efforts include the collection of disaggregated data which is data that is divided into smaller groups by identity such as race, gender, and sexuality [78, 161]. Data divided into subgroups provide opportunities to conduct deeper analysis which may lead to greater insights on resource allocation and performance level [128]; therefore, making it possible to monitor equity. Hence, our storyboards were generated on whether and how disaggregated data could be used and collected to monitor equity.

We developed four storyboards that reflect on this theme. We explored the important elements of data collection which involves what, when and where data is necessary to monitor equity (Figure 1, Number 1.1). We conducted an investigation on the specific data requirements for monitoring and evaluating equity in data-driven decision-making, while also identifying acceptable methods for conducting such monitoring. For acceptable methods, we probed on business owners' personal data revealed to the public (Figure 1, Number 1.2), the building department analyzing trends of the success and failures of permit applicants (Figure 1, Number 1.3) and building department employees receiving feedback on their potential unconscious bias while reviewing applications (Figure 1, Number 1.4). As an example of our storyboards (Figure 2), Taylor, a public sector employee in the building department, sees an analysis of the metrics for the permitting application success rates based on the identity and size of the business. The goal of this storyboard is to surface whether data monitoring based on demographic data is acceptable for business owners.

4.1.2 Scenario Theme: Prioritization of Resource Allocation. Our exploratory discussions revealed that challenges experienced by business owners and other stakeholders were significantly related to the speed of service delivery and to the amount of individual attention and flexibility applied to making the launch of a new business successful. When businesses submitted plans, these had to be approved before an inspection would be arranged. Any issues with a plan instigated delays in its correction, re-submission, and eventual approval by the business department, forming a drawn-out cycle that also echoed in inspections [130]. This system inadvertently puts small businesses in a precarious position, facing uncertainty and potential dire consequences from these unexpected delays [89].

Given these challenges, the scarcity of resources, and the fact that those who need the most assistance, such as first-time applicants and women-and minority-owned businesses, often receive

inadequate support, these businesses argued for additional support from the building department [89]. Such call for prioritization of resources for underserved stakeholders aligns with the equity-based definition of fairness, which recognizes that everyone receives the resources and opportunities they need in order to be successful (rather than everyone receiving the same resources). However, our exploratory discussions with the building department's employees revealed a different perspective– that the building departments' priorities in employing data-driven decision making lie in standardizing the permitting processes, making it the same for all businesses [89]. This raises the question of *whether and how the public sector should prioritize resource allocation to advance equity?*

To answer this question, we aimed to understand acceptance around prioritization of resource allocation, essentially how different actions to advance equity create different perceptions of fairness among community stakeholders. Therefore, we devised scenarios around prioritization of resource allocation to equip businesses with what they require most to succeed: whether and how applications should be prioritized, and who should make the decision to prioritize an application. Scenarios were oriented towards whether public sector employees should have the authority to prioritize (Figure 1, Number 2.1 and 2.2) as well as factors such as business owners' identities, neighborhood needs, and efficiency to consider when prioritizing applications (Figure 1, Number 2.3 and 2.4). The second row in Figure 2 elaborates an example storyboard. The building department employee can choose which application to inspect first: a local coffee shop that is further away from his house and that has been waiting two days for inspection or a large building site that has been waiting for three days for inspection. This storyboard aims to understand businesses owners' perception of whether the public sector employee should be given the authority to choose which applications to prioritize over another.

4.1.3 Scenario Theme: Information and Equity. The rise of data-driven decision-making and increased data availability has drawn attention to information equity. Information is useful only when an individual not only has access but also can derive benefits from it [112]. However, information is not accessible to everyone, and those who are socially and economically advantaged have historically gained greater access and better use of information [98, 112]. Acquiring the necessary information to succeed requires time and commitment that may not be available to everyone [140]. A mere abundance of information does not necessarily create equitable outcomes. Instead, reliable, relevant information that meets stakeholders' needs is considered a valuable asset [98, 140]. Based on these insights, we illustrate participants' perceptions of information equity, particularly about access and distribution of resources.

Our exploratory discussions with small business owners highlighted the challenges working with the building department, which were often phrased as the need for access to information on public sector practices and service delivery. Unexpected delays that were not clearly communicated, and lack of information for first-timers to succeed in opening their business were the main pain points including access to contractors and architects who are experts with the building department's application process. We were also inspired by our motivating anecdotes (Section 3.2), where prior connections with politicians gave advantages to the permitting process. These insights created an opportunity to explore how access and distribution of information regarding the decision-making and public service delivery processes with equity goals mitigate or amplify perceptions of fairness. Therefore, we aimed to investigate *whether and how access of information contribute to the advancement of equity in the public sector?*

We developed seven storyboards that discuss different types of information provided to small business owners. The scenarios involved information provided by the building department as support to first-timers and small local business owners (Figure 1, Number 3.1, 3.2, 3.6), ongoing

permitting process (Figure 1, Number 3.3) as well as inequitable practices (Figure 1, Number 3.4, 3.5, 3.7). For example, Figure 2 elaborates on a small business owner who receives a list of reliable contractors and architects by the City's building department. The goal is to understand business owners' perception about the building department being the access point for gaining information of reliable experts in the City.

4.2 Storyboard Development and Design Iteration

Using these three probing questions as guidance, we initially generated 30 design concepts, which were developed based on the challenges and experiences discussed in the exploratory discussions as well as prior literature. We filtered and combined design concepts, leading to 15 design concepts that capture the broad range of issues in the workflow of the permitting applications (e.g., submitting applications, scheduling inspections) and corresponding reactions [174].

We developed a core set of characters introduced in the scenarios, including residents (e.g., budding restaurateur) and building department employees (inspector, permit and license technician). To help participants imagine themselves in the scenario context [42], the characters' background stories were drawn from real-life experiences of the building department stakeholders identified during our exploratory discussions.

We generated two to three-panel storyboards for each scenario theme. We did not explicitly mention or discuss technical details, including concepts around data-driven decisions or how decisions are being made. Reducing the technical details ensures that the participants are not distracted by the technology but rather focus on their underlying desires and needs [42]. We did not include "equity" during the study to reduce misinterpretations of the word, but instead embedded the concept of prioritization of resource allocation based on different needs in the scenarios. We worked to separate the visual and verbal aspects so that in just a few words and pictures, the situation would be apparent to a participant. We then generated lead questions for each storyboard. Lead questions were meant to focus on the need the storyboard addresses and not on the specific solution that it proposes. These were asked immediately after reading the scenario aloud to ground the discussions. We removed and added new storyboards as we conducted sessions. We removed storyboards where participants consistently had little reaction. These did not work to provoke, or they captured situations of little concern to the participants. We added new storyboards based on sessions that revealed unknown issues of interest or concern that we wanted to understand better.

We illustrate the main themes and the summary of the final storyboards, which is also outlined in Figure 1. Figure 2 provides an example storyboard for each of our three probing questions, along with the lead questions we asked to frame the discussion. The complete set of storyboards including the lead questions is provided in the appendix.

4.3 Speed Dating Protocol

We conducted one-on-one sessions with business owners in person or online, depending on their preferences. We chose one-on-one sessions over a focus group approach to allow participants to share their true feelings about equity issues and public services. The sessions ran for about 90 minutes. In-person sessions were conducted in a university conference room or at the participant's business. Online sessions were run using the video conferencing tool, Zoom.

Sessions began with participant's consent, which included data collection of the study via video recording. We engaged the participants in a short discussion of their businesses and overall experiences interacting with the building department. Both worked as a warm-up to build rapport with the participants and provided data that helped us contextualize responses to the storyboards. We introduced our storyboard characters, then showed a single storyboard and read the text out loud. We immediately asked the lead question to frame the discussion on the inferred need.

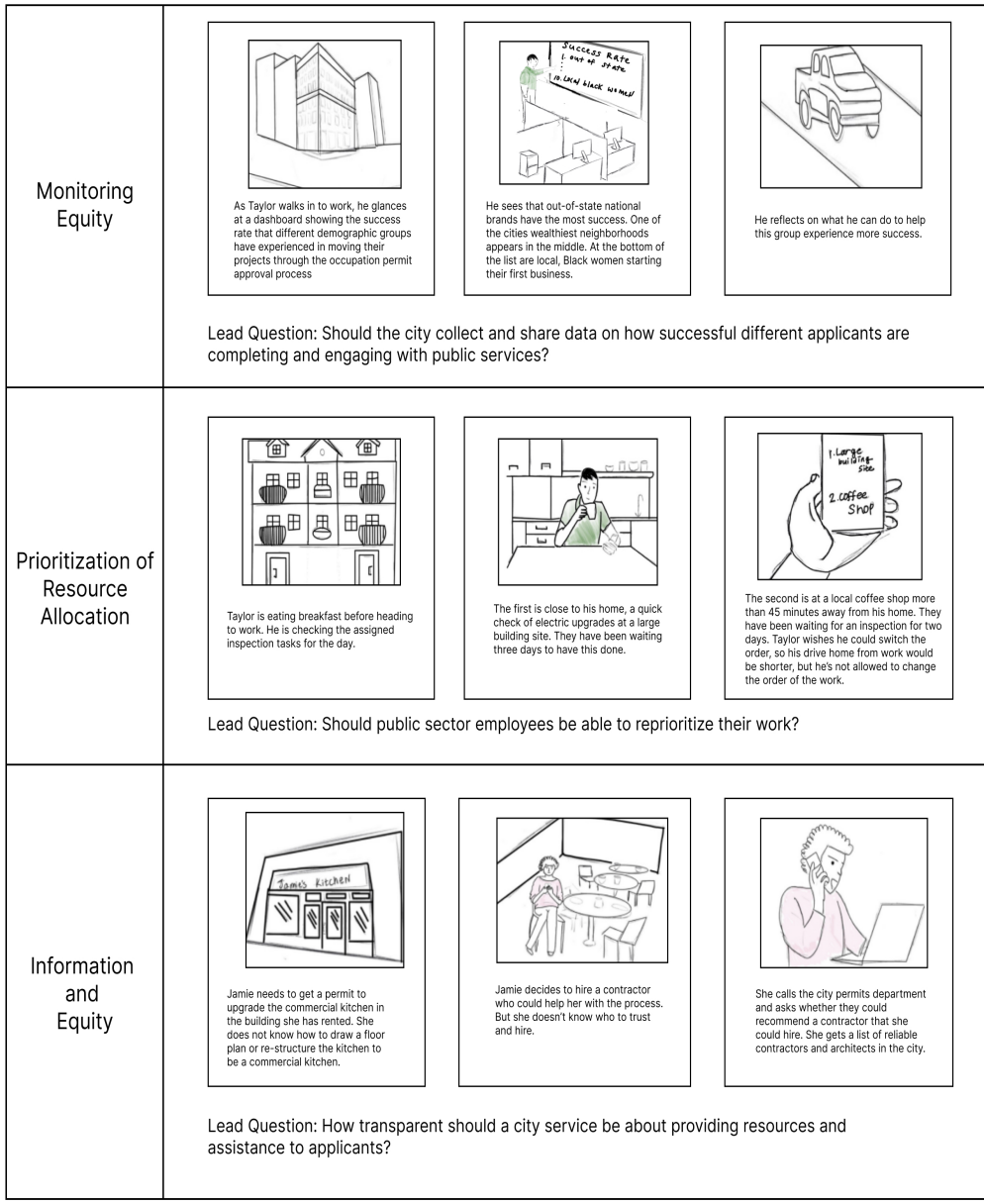

Fig. 2. Sample storyboards used in the speed dating session. The first column represents the scenario themes. The second column shows the storyboards used in the study along with the lead questions. The first row indicates a storyboard about monitoring equity. The second row shows a storyboard of prioritization of resource allocation, and the third row indicates information and equity. The complete set of storyboards is included in the Appendix

When participants had a strong or unexpected reactions, we asked them to reflect and explain the rationale for their responses. For each participant, we randomized the order of the storyboards

to ensure that the discussion was not centered on just one theme throughout the study. At the end of the session, we collected demographic information (ethnicity, gender), details of their businesses, and the frequency of interactions with the building department. Questions regarding the details of the business included the owner's connection with the business's location and whether they consider their business small, women-and minority-owned.

4.4 Participants and Recruitment

Participant	Ethnicity	Gender	Minority-owned	Women-owned	Business
P1	White	M	N	Y	Merchant
P2	White	F	Y	Y	Restaurateur
P3	Black	F	Y	Y	Restaurateur
P4	Black, American Indian	M	Y	N	Service
P5	White	F	Y	Y	Merchant
P6	Black	F	Y	Y	Restaurateur
P7	White	F	N	Y	Restaurateur
P8	White	F	Y	Y	Service
P9	Black	F	-	Y	Service
P10	White	M	N	N	Restaurateur
P11	White	M	N	N	Service
P12	Black	F	Y	Y	Service

Table 1. Participants' Self-Identified Demographics and Business Categories (minority-owned, women-owned). P9 did not answer the question on self-identified minority businesses.

We drafted a list of 294 small, local businesses located in the City, based on the U.S. Small Business Administration definition of a small business ("an independent business having fewer than 500 employees" [121]). The process of creating the list involved searching online for businesses across different neighborhoods in the City. We contacted the businesses in our list via email, cold calls, and flyers. When we distributed flyers by physically visiting the stores, in many cases, the owners were unavailable. We emailed 229 local businesses in the City and visited 65 stores and venues in person; however, we were contacted by only a very small number of business owners who were willing to participate in our study. In addition, recruiting through emails was a barrier as many local businesses do not have a direct email contact or a website. Therefore, we formed connections with local small business programs such as center for women entrepreneurs and small business coalitions to gain access to the small business communities. We learned that building a trustworthy relationship was essential as gaining access to underserved business owners, particularly those who had fears of discrimination and power hierarchies, was not easy. This process highlights the need for researchers to build meaningful connections with community groups that local communities trust, and have faith in [69].

Business owners contacted us by submitting a Google form, which included information about prior experiences interacting with the City's building department. We filtered out participants with no previous interactions with the City's building department. We offered business owners $55 for an online and $75 for an in-person session. The participants self-identified their demographics and the categorization of their businesses. 12 small business owners participated, among which 10 participants identified their businesses as women-and minority-owned. The definition of minority-owned and women-owned businesses was self-identified and not restricted to whether the participants were officially certified for such title. During the speed dating study, the participants identified the type of business they run in the City. The types of businesses that the participants identified were merchants, restaurateurs and service providers. The details of the participants' demographics are captured in Table 1.

4.5 Data Analysis

We analyzed our data using affinity diagrams [21] focusing on identifying insights and implications around equity in the building department's service. We held interpretation sessions with the research team to synthesize the findings from our interviews. As a group, we discussed the reactions of participants and resolved disagreements among the researchers through an iterative process. The first round of affinity diagrams included themes around similar responses regardless of the scenario themes. The second round of iteration evolved around the three scenarios. During the iteration process, we included information on whether similar themes were emerging among self-identified minority participants. We transcribed the video recordings through a transcription service [*]. We then analyzed each video using both the visuals and the transcript. We paid particular attention to points where participants had their strongest emotional reactions, as one of the essential steps in analyzing speed dating sessions [42, 177]. We also identified storyboards that did not probe any interesting responses. We underwent this process after each study to watch for emergent issues that might motivate the creation of a new storyboard that may be used for the upcoming speed dating session with other participants.

4.6 Research Positionality

As researchers in an academic institution, we conducted our work independently of the City's building department. We acknowledge our distinct and relative privilege in shaping the research direction compared to that of our study participants. Our team, based in the United States, has expertise in Human-Computer Interaction, Computer Science, Social Science, Design and Gender Studies. Our research team members have prior experiences interacting with public sector departments, public sector technologies, and underserved communities.

Prior study suggests researchers be compassionate and prioritize community values to curate meaningful data when involving community members [56]. Randall et al. emphasized that researchers take a stance as novices who aim to learn from the community members' expertise [137]. Recognizing the need to develop storyboard scenarios with an understanding of the City's business development context, we conducted exploratory discussions with domain experts, including building department employees, community members, architects, and small local business owners. Additionally, during the speed dating study, we asked questions about their businesses and interactions with the building department to help contextualize the participants' responses.

While we focused on broadly recruiting small local business owners, the majority of our participants self-identified themselves as a minority. Prior work on ethically conducting research with marginalized community members challenged design inquiries that do not address practical solutions [69]. We ensured that our storyboards were contextualized to the City's economic and cultural contexts, using local news articles and our exploratory discussions as guidance.

As the context of the storyboards illustrates equity issues in the City, we were aware that the storyboards could potentially trigger past trauma or unpleasant experiences for the participants. However, some participants expressed that surfacing such challenging experiences highlighted real-life hardships that the public sector should address. Therefore, we see speed dating as a method to raise awareness of real-life challenges and create avenues to gain insights into their own needs and desires for an equitable future.

[*]https://otter.ai/home

5 Findings

Our findings revealed a nuanced and sometimes conflicting understanding of how to integrate equity in the public sector data-driven decision-making, depicting a complex relationship between women- and minority-owned, under-resourced businesses and the building department. We first outline the tensions, complexities and benefits of monitoring equity in the public sector (section 5.1). We then illustrate different ways participants suggested for prioritizing resource allocation to achieve equity (section 5.2). Finally, we describe how access to information regarding public sector practices contribute to advancing equity (section 5.3). With each of these main themes we describe the factors that either concern the business owners or presents new opportunities about integrating equity into the public sector data-driven decision-making. Figure 3 illustrates a summary of the main themes as well as the concerns and opportunities related to them.

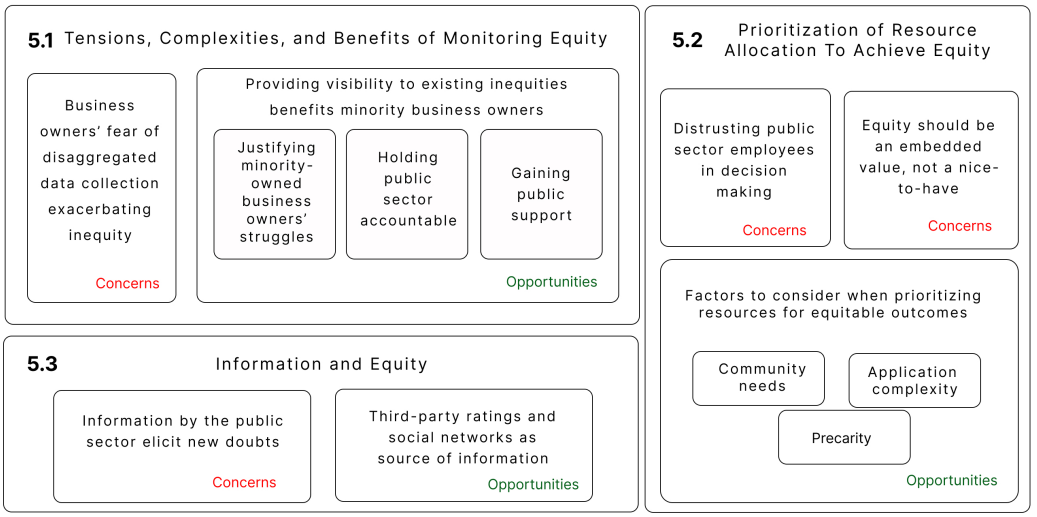

Fig. 3. Summary of our findings. We share the tensions, complexities, and benefits of monitoring equity (Section 5.1). We then share the participants' responses to prioritization of resource allocation to achieve equity (Section 5.2). Finally, we share the participants' concerns about information provided the public sector and the opportunities of leveraging alternative sources of information (Section 5.3). We highlight the concerns and new opportunities about integrating equity into public sector data-driven decision-making.

5.1 Tensions, Complexities, and Benefits of Monitoring Equity in the Public Sector

Our storyboards showed a future where the building department monitored and evaluated equity. Interestingly, almost all participants argued that such efforts would actually exacerbate inequitable practices. Participants were particularly concerned that public sector workers might discriminate against minority applicants if demographic-based data such as gender and race were visible. They argued that such data could become a label on their application that makes it more difficult for them to access resources. Despite these concerns, participants expressed that efforts such as demographic-based analysis could provide visibility to existing inequitable practices, potentially empowering minority business owners.

5.1.1 Business owners' fear of disaggregated data collection exacerbating inequity. Participants, especially those who self-identified as a women-and minority-owned business owner, were concerned that the disaggregated data (data broken down by detailed sub-categories) would be used to discriminate against them –contrary to the primary purpose of collecting disaggregated data (P2, P3, P4, P5, P6, P7, P8, P9, P11). Among the information proposed in the storyboards for categorization (e.g., past experiences, financial status, and demographic data), participants strongly reacted against demographic-based data collection, as providing information such as gender and race to the public sector *"puts a damper on us. [. . .] We're Black business owners female [. . .] it kind of puts a black x on our application"* (P3). Participants brought up that historical discrimination in the City and their first-hand experiences of racial or gender bias to back this argument (P3, P6, P9). For example, P6, a self-identified minority, said : *"We also have to historically think about why [....] demographic information is on this sort of application. [...] For me, a person of color, I know that typically this information is collected so that they won't give me something, [such as] bank loans"* (P6).

P9 expressed frustration when discussing the idea of the public sector's using race to identify successful permit applications among different populations, perceiving this as a performative action. She argued that in reality, public sector workers could automatically make assumptions about the applicants based on race. She described the sentiment of *"always feel[ing] like when [she] puts African American, [she will] not get hired"* (P9), and that being asked for racial identity *"creates trauma"* (P9). Moreover, participants argued that public sector workers could *"be judgmental or have opinions about [gender and race]"* (P2), and that providing such demographic-based information can actually make the public sector workers more skeptical of an applicant's ability: *"If you give up your gender, ethnicity [...] and then the inspectors are [like] 'Oh, this is like another women-owned business' [and if] they hold a bias, [...], I can see how that would be problematic"*(P7).

Participants expressed skepticism due to the lack of transparency on the building department's use of demographic data and questioned the need and relevancy for such information. When we probed further if the public sector being transparent about the potential outcomes and reasons for collecting demographic-based data, including race and gender, would be helpful, participants expressed uncertainty and lack of trust: *" Is it being used in a positive way or a negative way–that we may never know; that boils down to each individual that is actually like reviewing and seeing the information. [...] You can tell my lack of faith in the government"* (P5).

Given the participants' concerns with the public sector accessing and misusing demographic-based data, a few participants (P9, P10) proposed independent third parties to not only collect applicants' personal information but also oversee the permitting process to remove discrimination. We will discuss this option in more detail in the Discussion section.

5.1.2 Providing visibility to existing inequities benefits minority business owners. Despite the business owner's concerns, skepticism, and lack of trust in the public sector using disaggregated data towards monitoring and improving equity, we observed that participants saw value in not only conducting a demographic-based analysis of public service delivery but also exposing existing inequitable practices against small businesses. Our participants elaborated that efforts to provide visibility to existing inequities could empower minority applicants in various ways that we explain below.

- *Justifying minority-owned businesses' struggles.* P6 explained that demographic-based analysis not only confirms the presence of racism in the city but also explains *"why it may be a little bit harder for [minority groups] to access resources or access capital"* (P6). Such information empowers minority groups by justifying their struggles because *"it's a reminder to groups that maybe it's not an individual problem"* (P7). Additionally, some participants (P1, P7, P8, P10) resonated with the storyboards illustrating detailed recordings and correspondence between business owners and politicians being visible to the public. The storyboards shed

light on inequitable practices of small local businesses leveraging political influence to nudge the building department to expedite the permitting process and receive the support that they need. Participants who resonated with this scenario argued that information about such inequitable practices highlights the inadequacy of the building department being able to provide the needed services to its applicants.

- *Holding public sector accountable for addressing the broader inequities in public service delivery.* A few participants (P6, P7, P8) valued the practice of public sector workers being informed of their implicit bias– making them aware it might impact their decision making process when reviewing applications. Some (P1, P6, P7) shared positive reactions towards calculating and presenting employees' implicit biases that involve analyzing based on applicants' personal and demographic data. Analysis of implicit bias could help surface existing biases as public sector employees "*may not be aware of [such biases] until there's some data*" (P6).
  Participants also stressed that demographic-based analysis across application success rates could become a catalyst for both the public sector and applicants to investigate why disparities exist across demographics. Such analysis could encourage the improvement of public services in areas such as minimizing the cost of the application or identifying groups that need further assistance. P1 addressed that these practices could be a *"small step towards addressing a broader issue in the [public sector worker's] quest [...] to help this group experience more success"* (P1). A few participants (P5, P2, P6) indicated that the analysis could help the City identify how to allocate resources to applicants and flag businesses that need further support.

- *Women-and Minority-owned businesses gaining public support through disaggregated data visibility.* Participants discussed how making the demographic-based data (race, gender, ethnicity) visible to the public could bring support to small local business owners. This reaction came from their belief that the public has the best interest in helping underserved business owners in the community. P9 elaborated that sharing such data could be a *"perk because [community members] do support Black-owned businesses or Asian-[owned businesses]"* (P9). Such support could be in the form of receiving feedback (P7), financial resources (P6, P12), and gaining advertising opportunities (P1, P7, P8, P10). One participant even responded strongly, saying that *"anyone but a public sector worker"* (P3) should be able to see information, trusting that the general public would help local businesses genuinely.

5.2 Prioritization of Resource Allocation To Achieve Equity

When presenting storyboards about the public sector allocating resources, participants raised questions about who makes the decisions and how they are made. Participants particularly expressed concerns about the public sector employees being responsible as the decision-makers of prioritizing resources. If public sector employees were to make these decisions, participants argued that equity should be an embedded factor in the delivery of public services, not a choice. Despite these concerns, we found that participants favored prioritizing applications based on community needs, application complexity, and precarity of business rather than identity-markers. Below, we share participants' concerns as well as opportunities suggested by them about resource allocation prioritization in order to integrate equity into public service delivery.

5.2.1 Distrusting public sector employees in decision-making. When we presented a future in which public sector workers would be given the autonomy to re-order the applications, some participants lacked trust in public sector workers' decision-making due to their subjective power, implicit biases, and lack of understanding community needs. Participants shared concerns about the possibility

of receiving worse service as a result of employee autonomy. For example, probing whether data-driven decisions or humans should be making decisions on the order of the applications, P10 expressed fear of *"some punishment or repercussion"* (P10) by employees just because of their personal preference. Similarly, P11 shared that *"corruption is everywhere. [...] All of a sudden, you've got [...] re-prioritizing to go to all of the big companies' properties first. [...] Then small homeowners are completely disadvantaged because they don't have the money or influence over the inspector"* (P11). Participants justified this belief by stating that public sector agencies generally do not understand citizens' real needs and hardships (P3, P6, P8, P10). P6 lamented that public sector workers *"don't understand all the hard work, and blood and sweat and tears"*(P6) that applicants experience going through the permitting and inspection processes.

5.2.2 Incentive structures for public sector employees to encode equity: Equity should be an embedded value, not a nice-to-have. Participants shared different perspectives around incentivizing public sector workers to produce equitable outcomes. While some participants reacted positively towards monetary-based incentives (P8, P10, P11), others (P3, P5, P7, P9) reacted negatively. For example, P3, a self-identified minority, seemed upset about rewarding public sector workers for doing their job. She vehemently argued that public sector workers getting a reward itself is unjust: *"How many times have we done our jobs and gone above and beyond? Will we ever be rewarded? I know I wasn't"* (P3). We found that participants had expectations that within a good and effective public service, public sector workers would already consider equity as a standard part of their work practices, not an extra. These participants expected public sector workers to be self-motivated to make decisions based on equity that *"really [comes] from the heart"* (P9).

5.2.3 Factors to Consider When Prioritizing Resources for Equitable Outcomes. Several participants (P2, P3, P8, P11) outright rejected the notion of their identities being used as a basis for advantages or prioritization in the application process. P3 strongly advocated that prioritization of resource allocation, specifically the order of the applicants being processed by the building department, shouldn't be based off of one's identity: *"[Whether] I'm a Black woman or a Asian woman or a White woman. It shouldn't be based off of our demographics, it should be based off of that product."* Instead, participants argued for prioritization of resource allocation based on non-identity attributes: a) community and neighborhood needs, b) the complexity of the application process, and c) the precarity and uncertainty that small businesses face.

- *Prioritization based on community needs.* Participants (P1, P3, P6, P9, P10, P12) reacted positively to storyboards about prioritization of resource allocation based on community needs. They suggested that addressing community needs could be operationalized in various ways. These suggestions include prioritizing small local businesses that directly address the local neighborhood's needs. P3 responded that since small local businesses are the *"backbone of the community"* (P3) who create the community's positive image (P3) and bring new employment opportunities (P12), an agenda is needed to further support these businesses.

- *Prioritization based on complexity of application.* All participants except for one suggested new ways for prioritizing resources in the public sector. Some favored having applications prioritized based on application complexity. P11 proposed grouping applications based on the application's complexity so that businesses with simpler needs could move faster. This opinion aligns with the discussions that small business owners should be prioritized because the work's complexity is smaller, making the application process faster. Moreover, some participants also supported the idea of giving public sector workers autonomy and independence to re-order the applications based on the complexity of the cases. Not all participants immediately agreed with the idea of prioritization. However, when researchers mentioned

real-life prioritization examples, such as an express line in a grocery store, they seemed to warm up to the idea. We observed five participants who changed their perspectives and expressed the need for a complexity-driven prioritization approach.

- *Prioritization based on precarity.* Across different storyboards, participants shared that small, local, women-and minority-owned businesses should be prioritized due to their precarity. P10 elaborated that unexpected delays could *"be a death sentence for small businesses that lose an opportunity"* (P10). Participants justified their reactions by claiming that long wait times would not damage large businesses as much, since they have greater financial resources. Similarly, when the public sector workers recognize the difference in success rates between large businesses and minority-owned, small local businesses, P7 suggested that the department should make the permitting process cheaper and develop a branch that focuses only on such vulnerable businesses.

5.3 Information and Equity

In our exploratory discussion, we observed that acquiring information, such as the expected timeline of the application process, is crucial for successfully building a business in the City, especially for small local business owners (Section 4.1.3). However, participants were doubtful of the building department providing reliable information intended to support small business owners. Instead, participants discussed alternative sources for gaining the same information from other sources, such as third-party ratings or small business owners from the local community.

5.3.1 Information provided by the public sector could elicit new doubts. Our exploratory discussion suggested that small business owners, especially first-timers, relied on experts (e.g., architects, contractors), and sometimes they had trouble finding the right expert. We probed on the public sector providing information including a list of reliable experts in the City and numerical ratings of each of the experts. However, when we shared a future where the business department shared names of reliable experts, participants (P1, P4, P5, P7, P9, P10, P11) were doubtful about it. They were concerned that this list of reliable contractors or architects coming from the public sector may misrepresent the community, be miscalculated, or even be created through inequitable means. Our storyboard intentionally did not specify how the list is curated. P4 speculated that entrepreneurs might have needed to submit a request to be added to the list, which could disadvantage small businesses that do not have this knowledge. If this list were to be created, P4 suggested the need to put additional efforts to include non-white businesses.

Based on such responses, we probed further whether numerical analysis of inspection failures or success rates of completing the application in time by experts could be a more credible resource than a list of experts. While P11 expressed willingness to accept the numerical analysis of inspection failure rates conducted by experts, he questioned how the failure rates are calculated and whose opinions are being represented. The participants deemed having one negative mark impacting the failure rate unfair, especially when the data becomes public: *"Like what constitutes a failure rate? Could it be just one inspectors' opinion? [...] So then if you're a contractor, you could get a negative mark. In that instant, I just don't think that's right, that you would publish that"* (P11).

Not all participants expressed concerns about the public sector creating a list of reliable experts. Some participants expressed that such information would be helpful for applicants who lack experience in the permitting process, especially as small business owners have limited time and money to find additional resources outside of government resources. For this reason, participants argued that information provided by the government should be reliable, especially as government websites are usually the first form of information that applicants see when they start their businesses.

5.3.2 Navigating expertise: third-party ratings and social network as sources of information. Amid doubts about information provided by the government, participants shared alternative sources they would rely on to gain knowledge of reliable experts familiar with the building department procedures, such as contractors or architects. Participants shared that the government does not need to provide such information. Some participants argued that third-party rating sites such as Yelp, Google, or social media platforms already exist to offer dependable evaluations of contractors or architects (P2, P4, P5, P11). Additionally, participants noted that knowledge sharing is already prevalent among small business owners, who rely on personal recommendations and reviews from other small business owners in the local community (P2, P7, P8, P11). P2 shared that knowledge gained from "*other restaurant owners, other coffee shop owners, other people that have built and done things …*" is valuable because "*they've experienced it firsthand*". This finding aligns with prior research indicating that social networks serve as a route of gaining information [140, 172].

A few participants argued that finding reliable experts should fall upon the business owners, not the building department (P2, P5). P2 described the process of hiring an expert as a process to "*get[ting] to know them and see if you can work with this person, if it's going to be a good fit*". Merely relying on metrics of the person's competency or third-person anecdotes may lead to risky decisions as a competent expert does not necessarily mean that the person is compatible.

6 Limitations

We have designed the scenarios to reflect the key issues that were discussed from diverse stakeholders during the exploratory discussion and prior literature in the storyboards; however, these scenarios may not capture every instance of inequitable practices and potential approaches in the public sector. A future study to surface different equity interventions would be important as our findings capture only a few aspects of integrating equity. Our study was conducted in a Northeastern mid-sized U.S. city with a population of around 300,000. Larger or smaller cities in the U.S. may have different community environments or perspectives towards the public sector that may impact their reactions towards the scenarios. For example, the City has been consistently grappling with gentrification and displacement of minorities local to the community.

7 Discussion

As public sector agencies increasingly adopt data-driven decision-making systems, there is growing concern within the research community [11, 26, 36, 148, 158, 166] regarding equity. Even when public sector agencies endeavor to consider equity as an explicit goal in designing data-driven innovations, such values are inadequately operationalized in practice [92, 140, 141]. This shortcoming primarily arises from a lack of substantial and early engagement with the affected stakeholders, particularly those from marginalized groups, thus failing to fully comprehend their true needs, desires, and perceptions surrounding equity.

In our study, through speed dating, we proposed provocative futures to a group of under-resourced business owners to capture a deeper level of their needs for incorporating equity into the public sector service delivery. As the scenarios touched upon various equity-based interventions, our study surfaced insights into the challenges and nuances of integrating equity in the public sector data-driven decision-making. Based on our findings, we highlight design implications for designers of public sector data-driven decision-making systems to consider in the early stages of designing and incorporating equity into these systems. We address design implications in the context of 1) dilemmas of monitoring equity 2) navigating the complexities of integrating equity 3) reflecting on the development of data-driven decision-making systems.

7.1 Dilemmas of Monitoring Equity: The Battle of Trust Towards Public Sector

Monitoring equity is crucial for the public sector as a way to surface inequitable practices and identify who are negatively impacted by these practices [53]. When monitoring equity, one way that public sector agencies suggest is collecting and using disaggregated data [78]. Disaggregated data enables deeper analysis based on factors such as gender, race, and ethnicity etc, surfacing existing discrimination and surface patterns into smaller units [103, 108, 128]. Evaluations using disaggregated data requires gathering data from often overlooked communities and ensures public sector agencies are accountable [30]. The absence of disaggregated data makes it challenging to understand disparate impact across different groups. For example, during the COVID-19 pandemic, the absence of sex disaggregated data created challenges of comprehensively understanding why men were at a higher risk of dying from the disease compared to women [48]; in response, the Biden Administration formulated the "Equitable Data Working Group" with the goal of examining existing federal data collection policies and curating infrastructure to assess equity [78].

However, collecting demographic-based data is challenging, especially as prior literature suggests that data work is often devalued, underappreciated, and time-consuming [84, 110, 145]. Participants in our study reacted negatively towards the idea of their identities being collected by the public sector with the fear of potentially being discriminated if their identities are revealed, even though such data contribute to monitoring equity. On the other hand, participants reacted positively towards demographic-based analysis which includes analyzing different trends of public service delivery across various applicants as it would validate the existing struggles experienced by small businesses, particularly women-and minority-owned businesses, in the community (Section 5.1).

Such findings align with existing and contentious debates around whether identity such as gender and race should be even considered as a factor in making data-driven decisions [28, 68, 91]. While using identity markers for making decisions could pave the way for developing policies and decisions that could detect existing discrimination, it could potentially exacerbate existing biases [20]. In addition to this duality of using identity markers for making decisions, we observed the participants' willingness to disclose their demographic information was contingent upon their trust towards the public sector. Participants, especially self-identified women and minority business owners, expressed that being asked by the public sector to provide demographic-based data triggers trauma and concerns on potential discrimination they may receive.

Despite these concerns, not recognizing and surfacing inequitable practices—a task primarily accomplished through the analysis of demographic-based data— poses a significant dilemma: without this analysis, it becomes difficult to even identify the problem, let alone address it. As Dombrowski et al's [53] put it, "Recognizing a phenomenon as a problem is the first step necessary to work towards social change"(Dombrowski et al. p. 661). In the following sections, we synthesize potential solutions to mitigate the trust barriers between the public sector and its constituents.

7.1.1 Third Party Auditing and Monitoring Equity. The organization's reputation impacts whether or not people are willing to provide their personal information [127]. This trust towards the organization is imperative for collecting disaggregated data; therefore, we suggest the public sector to partner with third-party agencies such as independent academic institutions or community organizations that are not directly employed or contractually tied to the public sector but are dedicated to the process of auditing government services [136]. The benefits of external organizations include avoiding the influence of the public sector agency's internal interests in the auditing process [136]. These third-party organizations are often independent academic researchers, civil society organizations, investigative journalists, etc. [134]. For example, the American Civil Liberty Union [12] and academic institutions evaluated public sector algorithms, surfacing existing disparities [36, 38, 62] and developed toolkits to facilitate audits and advocacy [124].

7.1.2 Community-Based Data Sharing Practices and Open Data. Our study points to how our participants, particularly women and minority business owners, reacted negatively towards the public sector collecting demographic-based information due to the lack of trust and transparency of how their data will be utilized. Such distrust is warranted due to historical instances of data errors and miscategorizations by the U.S. government that have negatively impacted marginalized populations, leading to loss of healthcare access and erroneous tax requests [138]. Despite prior literature that states marginalized populations have the tendency to limit their disclosure of personal information in social media accounts and utilize restrictive privacy settings [146], participants favored the disclosure of demographic-based data to the public with the belief that the public would genuinely help and support women-and minority-owned businesses (Section 5.1). Moreover, participants shared that a network of business owners were valuable sources of gaining information (Section 5.3.2). Leveraging these insights, we advocate for community-based data-sharing practices that could empower underserved community members and bring transparency and accountability to the public sector practices [170].

Community-based organizations with deep ties to local constituencies are effective in collecting truthful and accurate data from community members, including sensitive personal information that is historically challenging for government agencies to obtain [48]. Examples include local communities successfully contact-tracing sexually transmitted diseases such as HIV/AIDS by establishing close relationships with the local Black and Latinx communities [34]. Additionally, the Data for Black Lives (D4BL) organization contributed to collecting and analyzing COVID-19 impact on Black Communities [173]. We also draw insights from gig workers (e.g. Uber drivers), who have been documented sharing experiences via online forums as a form of collective action against algorithmic management [96, 172]. This approach underscores the power of data sharing in fostering community support and enhancing transparency, effectively allowing public sector practices to be held accountable and advancing equity in the process [49].

Another way to hold public sector agencies accountable is by ensuring transparency in their data practices through open data initiatives. Open data is a public data set from the government that promotes transparency of public sector practices, citizen engagement, creating a perceived sense of trust in the public [13, 44, 105, 171]. While open data is a common practice in the public sector, our findings emphasize that simply providing data to the public may not be a meaningful way to advance equity. In Section 5.3, participants expressed skepticism towards information provided by the public sector which was intended to become a useful resource to small business owners. Such mistrust towards the information itself may originated from the general skepticism that the participants have towards the public sector. Prior literature elaborates that users were unable to trust the information given by a social media platform due to the distrust towards the social media platform itself [163]. Therefore, while we propose the need to provide additional transparent information on how the data is generated by the public sector [104, 127], the essence of building trust between impacted stakeholders and the public sector needs to be developed.

However, collecting data via third-party agencies poses potential risks, including privacy violations [28, 165, 175] that could negatively impact underrepresented communities [157]. Without careful considerations on how identity would be represented in the data, potential harms of miscategorizing or abstracting individual characteristics could be inflicted upon community members [1, 28]. Hence, we suggest third-party agencies to provide transparency to why, what and how sensitive data is collected, as well as what measures were taken to ensure such data is secure and private [10, 35]

7.2 Navigating the Complexities of Integrating Equity in Data-Driven Decision-Making

Our study corroborates and extends insights from previous work, highlighting the complexities and nuances of integrating equity due to diverse and conflicting perspectives on resource allocation and prioritization [92, 94]. Given the discriminatory challenges that women and minority business owners reported in our exploratory discussions (Section 4.1.1), we expected minority business owners would favor public service delivery that prioritizes their applications based on their marginalized identity. Historically, the U.S. has implemented affirmative action policies that aim to increase opportunities for marginalized communities in several domains, such as employment and education [74]. However, we were surprised at the strength of the negative reactions that participants, particularly women and minority business owners, had against the idea of special treatment based on identity, such as gender and race.

This finding highlights the need to engage with impacted stakeholders in the early stages. Prior literature found that efforts to embed equity as a goal failed because the factors that were considered to be equitable did not address the real needs, priorities and goals of those who are directly impacted by these equity-based decisions [92, 140]. As designers, it is crucial to communicate with the community members first who are impacted by these equitable decisions because often what may seem to be an important factor for integrating equity may not be what the community members really need and desire.

7.2.1 Speed Dating as a Method to Navigate Challenging Design Problems in Public Sector. When design is focused on the status quo, without considering design for critical change [15], it can benefit the privileged groups and marginalize already underserved populations even more, resurfacing existing inequities and power imbalances [16]. Therefore, we propose public sector agencies to consider adopting speed dating as a method when designing ways to integrate equity to capture a deeper level of impacted communities' needs and desires through storyboards that represent diverse alternative futures. While this method has been used in diverse contexts such as employment [50] and public services [174], speed dating could be used to uncover needs and desires in the initial stages of integrating equity through data-driven decisions. Prior literature highlights that when embedding equity, conflicting views among stakeholders on how to prioritize resource allocation has been a challenge [92, 94]. Our participants also suggested diverse and conflicting views on how to prioritize applicants; however, we also found that participants do not want demographic-based prioritization. Such finding was possible because our storyboards triggered negative reactions toward demographic-based prioritization (Section 5.2). Knowing what the impacted stakeholders and community members consider as equitable before a data-driven decision-making system is developed becomes a valuable information to the public sector. Not only does it deter public sector agencies to make assumptions about what is equitable to the community members [140] but also prevents the need to abolish such system that could create a long lasting impact [55]. We emphasize that this practice of making efforts to improve the system after its deployment may not undo the impact it already created. For example, in the case of a grading algorithm used for UK-based high school diploma exams, completely removing the algorithm from society did not remove the effects it already had on the stakeholders. This *"algorithmic imprint"* [55] highlights the importance of critically evaluating and considering how to integrate equity by engaging with underrepresented communities during the early stages of the design process.

7.3 Techno-solutionism in Public Sector Data-Driven Decisions

Public sector agencies have increasingly adopted data-driven approaches and harnessed large amounts of data to advance efficiency, objectivity, transparency, and accountability of the government function given the limited resources that it has [7, 71, 97, 116, 168]. This adoption of

data-driven approaches and algorithmic systems by the public sector is not a new phenomenon. Evidence-based decisions have been the cornerstone of decision-making even before the advancement of artificial intelligence, as public sector agencies have leveraged e-government systems and technologies such as surveillance tools as means for collecting data [63, 90]. Hence, given this increasing trend of adopting data-driven decision-making systems, we are not arguing that technology or data is a solution for addressing equity issues [114]. Techno-solutionism is a term often used to describe the tendency to merely use technology as means to solve problems, and overlooking the nuanced, complex and messy issues that need to be addressed [31]. As our findings highlight the complexities of integrating equity into these data-driven decision-making systems, we argue that equity should be embedded in the design and process of these decisions rather than considering equity issues as an afterthought. We argue the need for embedding equity in the development of public sector data-driven decision-making processes especially in the early stages.

8 Conclusion

In this paper, we conducted a speed dating study with small local business owners, including self-identified women and minority business owners to explore three essential aspects of equity: monitoring equity, resource allocation prioritization, as well as information and equity. Our findings suggest complex and nuanced reactions towards different equity-interventions illustrated in the scenarios. While efforts to monitor equity via disaggregated data, particularly demographic-based data, was strongly opposed due to the concerns of exacerbating inequity, participants emphasized the need for demographic-based analysis. Participants, including women- and minority-owned business owners, proposed for prioritization of resource allocation not based on identity but rather community needs, complexity of the applications, and precarity of the applicant. Based on our findings, we provide design implications for integrating equity in public sector data-driven decision making systems. To monitor equity while overcoming the obstacles of distrust towards the public sector, we suggest trusted third-party auditing and community-based data sharing practices. We examine utilizing speed dating as a method to navigate unique challenges of integrating equity for early-stage stakeholder engagement, as well as the need to embed equity in the development of data-driven decision-making processes.

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A Storyboard

Here we illustrate all the storyboards developed and used in the study. We developed a background story and the following core set of characters in the storyboards: city residents (a budding restaurateur, non-profit organization activist) and building department employees (inspector, permit and license technician).

A.1 Background Story

We would now like to introduce the setup of the study. We are going to do a activity to explore how administration's goal is carried out in city services and public sectors. Throughout the entire session, we will introduce you to fictional characters and fictional stories. We want to emphasize that although we ask for your opinions, the stories presented to you throughout the entire study do not reflect any of the real-life decisions made by the current city government. Through this session, please imagine that you are a business owner in a fictional city. The city administration in this fictional city is implementing new plans and goals for government departments. Among all the new plans, one plan is to make sure that the city is fair and just. Among the many government departments in this city, we will focus on the Department of Permits, Licenses, and Inspections. Here, in this fictional city, you will be introduced to 4 characters: Jamie, Alex, Taylor and Morgan.

A.2 Characters

- Jamie Williams, a 38 year old Black Asian female, has worked all the restaurant jobs over the last twenty year. She's been a server, hostess, prep cook, chef, and assistant manager. She's worked across most of the restaurants in the low-income neighborhood where she grew up. Recently, her neighborhood has started to gentrify, and everyday it seems to be harder and harder to find an inexpensive place to eat that still cares about the food they prepare. She wants to use her savings as well as a small investment from her mom to open a new restaurant. She wants to turn her experience in the business to start a new venture that helps

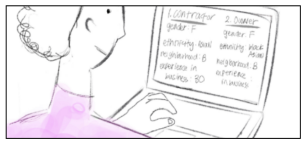
her neighborhood hold on to the character it had in her childhood and that serves the local residents who still call this area home. This will be her first business.

- Alex Pappas is a Greek, 54 year old permit and license technician. This is her second career after 20+ years working as a steamfitter. She likes keeping the city she grew up is safe, and she likes watching it transform and grow. She has worked as a technician for her city's office for 10 years. Her main work involves explaining application requirements to applicants though phone calls and checking whether all requirements are met. She feels like she's just getting the hang of surviving changes to city administration. She love how her Greek heritage is still celebrated in the city.
- Taylor Smith is a White, 32 year old inspector. He recently moved back to the city of his birth to take the job as an inspector, a position his father worked on for many years and who was born and raised in the city. Taylor finished training with a senior inspector just a few weeks ago after receiving the inspector certification. He started his job in the department just a few months ago. When he is in the field, he is sometimes anxious that he does not do as well a job at helping business owners find solutions.
- Morgan Kim, is a 35 year old Asian-American female, who is a resident of the city working as a non-profit organization activist advocating for justice and equality. Born and raised in the city, she grew up in a low-income neighborhood. After finishing her graduate education majoring in urban planning, she moved back to the city to join one of the city's nonprofit organization. She spent the past 5 years concerned with restoring low-income neighborhoods, creating plans for affordable housing and providing economic assistance to low-income families. She loves the people in the city and wishes to see the city continuously grow.

A.3 Full Storyboards

1.1 The building department collects project and personal information such as demographics and financial resources devoted to the project

Jamie needs to get a permit to upgrade the commercial kitchen in the building she has rented. As she's filling out the application, she wonders why the system is asking about her gender, ethnicity, neighborhood where she lives, and if she has ever run a business before. The system is asking to fill out the same information for everyone who is part of the application process such as her contractor and architect.

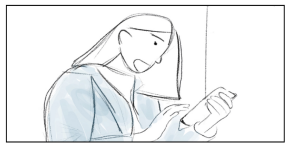


Jamie knows that different politicians have promised to make her city better for women and minority owned local businesses. But she's concerned that providing this information might have the opposite effect.

Lead Question: What kind of information should the city collect in order to understand how different applicants in different types of businesses are doing in the city?

1.2 Applications to the building department are made public. Everyone can see the demographic information, such as a race and gender, for every business applicant

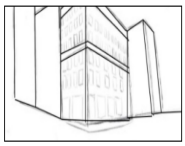
Morgan waits at the bus stop to go home from work. The stop is in front of Jamie's still unopened restaurant. It's been months, and Morgan wants to know about the owner and about when it might open.



She uses her phone to look up the business on the city's site. She sees the restaurant is awaiting a final inspection. She also sees that Jamie is a Black Asian woman first-time business owner.

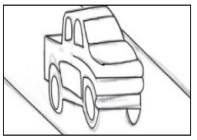
Lead Question: Should information about businesses engaged with city service be made available for other citizens to see, does this increase the transparency of a city service?

1.3 The building department sees data on applications' success based on the business owners' demographics



As Taylor walks in to work, he glances at a dashboard showing the success rate that different demographic groups have experienced in moving their projects through the occupation permit approval process

He sees that out-of-state national brands have the most success. One of the cities wealthiest neighborhoods appears in the middle. At the bottom of the list are local, Black women starting their first business.



He reflects on what he can do to help this group experience more success.

Lead Question: Should city collect and share data on how successful different applicants are completing and engaging with public services?

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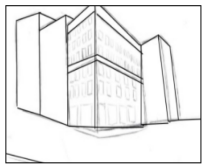
1.4 Public sector workers receive feedback on their performance based on applicants' demographics, possibly exposing implicit bias



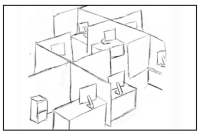
Alex looks at a long list of unread work emails. She sees one from an automated system that monitors and analyzes all of her and her co-workers' work.

The email tells Alex that the average time it takes for her to move a business from submitted application to approval is a few days slower than the average for the whole office.

The email also tells Alex that she is less successful when working with women owned businesses than her colleagues.

Lead Question: Would feedback on implicit bias change how public sector employees work with their citizen customers (applicants)?

2.1 Public sector workers receive a financial reward if they prioritize specific applications



Alex opens the system and looks at all of the new applications that arrived over the weekend. She needs to check that each is complete before passing it along.

The system shows ten new applications listed in the order that they arrived. Six applications out of the 10 applications are marked green. It is for a project in a neighborhood the city has prioritized for redevelopment.

Alex decides to start with the marked-green business. She gets a small bonus for prioritizing the city's prioritizes.

Lead Question: Should public sector employees be rewarded to achieving the priorities of current administration?

2.2 Public sector workers have the ability to re-prioritize the order of the applications

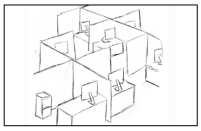
Taylor is eating breakfast before heading to work. He is checking the assigned inspection tasks for the day.

The first is close to his home, a quick check of electric upgrades at a large building site. They have been waiting three days to have this done.

The second is at a local coffee shop more than 45 minutes away from his home. They have been waiting for an inspection for two days. Taylor wishes he could switch the order, so his drive home from work would be shorter, but he's not allowed to change the order of the work.

Lead Question: Should public sector employees be able to reprioritize their work?

2.3 Public sector workers can prioritize applications that have more positive impacts on a neighborhood



Alex opens the system and looks at the results of a recent survey created by the city to understand what stores residents need in their neighborhoods.

The survey shows that one low-income neighborhood needs a small grocery store to get their food, while one of the wealthiest neighborhoods wants a shopping center.

Alex reflects on what she can do to help the low-income neighborhood get their needs met.

Lead Question: Should information about neighborhood needs in the city influence the operations of the public sector? Should this influence the services different neighborhoods receive?

2.4 Applicants see large businesses take 2 days to get a response while small businesses take 10 days

During the first inspection, Jamie learns of changes she needs to make to her current plans. She works with her contractor to make the needed changes and uploads the documents to the city's site within two days of her inspection.

A few minutes after uploading the changes, she gets an automatic notification. The message says that the waiting response is 10 days. If you are a large business, the staff will notify you in 2 days.

Lead Question: Do customers benefit from realistic transparent estimates on how long processes will take?

3.1 Public sector connecting applicants and recommended experts (contractors, architects) in the city

Jamie needs to get a permit to upgrade the commercial kitchen in the building she has rented. She recently had a terrible experience with the previous contractor she hired.

Jamie decides to hire a new contractor who could help her with the process. But she doesn't know who to trust and hire.

Jamie checks the city department website to see the success rates of local architects and contractors.

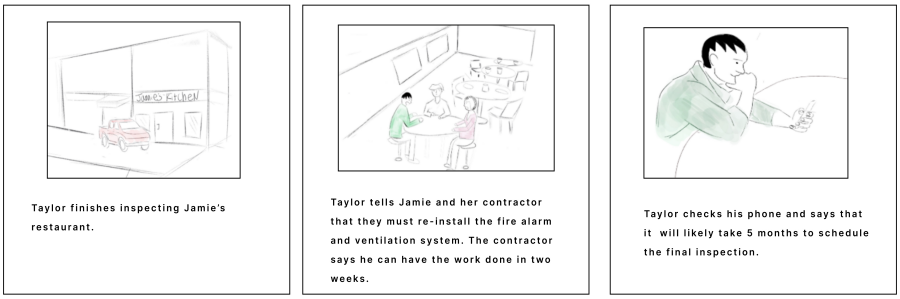
Jamie wonders who she could hire.

Lead Question: Do customers benefit from city service being a liaison between, like a connector between owners and contractors?

3.2 Building department recommends contractors and architects that have had many successful interactions with the building office

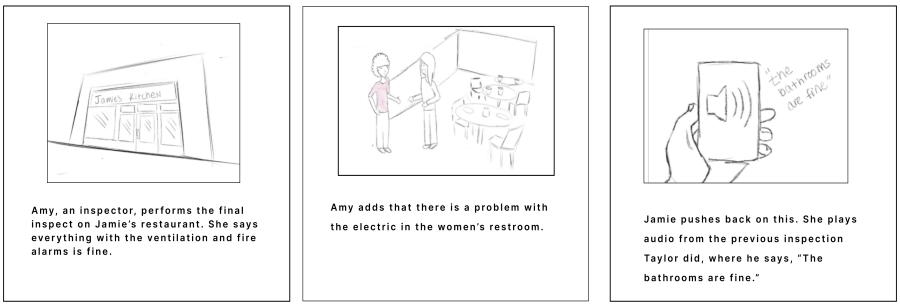
Lead Question: How transparent should a city service be about providing resources and assistance to applicants?

3.3 Building department technology estimates when the next action (inspection) will happen. The duration is long



Lead Question: What do you think is the best way to coordinate work between inspectors and contractors to be the most efficient?

3.4 Building department records and transcribes conversations during inspections. This transcript is available to the business owner, so they have evidence of what the previous inspector said.



Lead Question: Is it realistic for customers to expect the same requirement from different inspectors?

3.5 Interactions between politicians and specific applications in the building department's system are recorded and made public.

Jamie has been having trouble getting approval with her permit application. To ask for help in moving the process faster, she calls one of the city council members that she personally knows.

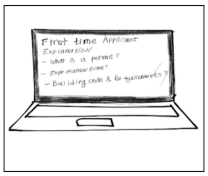
The next day, Jamie receives a notification that her application has been approved. As she confirms her application status on the department website, she sees that her communication with the council member to expedite the application is public.

Lead Question: Do you think business owners engaging with city politicians being public will benefit business owners who are starting their business? How would you use this kind of information if it was public?

3.6 Building department's system provides onscreen explanations to guide first-time applicants over common problems encountered by earlier applicants.

Jamie is meeting with the contractor she recently hired to work through the permitting application process.

During the meeting, Jamie and the contractor has a disagreement with the floor plans and budget estimation for the construction process. Her contractor disagrees with Jamie's plans and ideas.



Jamie pushes back and reads the permit process explanation for "First Time Applicants" described on the application website to present her case.

Lead Question: Do customers benefit from different permitting process explanations based on different expertise?

3.7 Applicants make a preference whether they want high quality but delayed service or low quality but fast service.

Both Taylor and another inspector finishes inspecting Jamie's restaurant.

They both tell Jamie and her contractor that they must re-install the fire alarm and fulfill the disability access inspection (ADA) requirements. The contractor says he can have the work done in two weeks.

The inspectors check their phones and says that it will take 5 months to schedule the final inspection with them and 4 months to schedule with another two inspectors.

Lead Question: Is it realistic for customers to expect better quality but delayed city service?