Community Tech Workers: Scaffolding Digital Engagement Among Underserved Minority Businesses

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Small businesses are being encouraged to use digital technologies more than ever before. However, the greater emphasis on technology adoption puts underserved minority business owners (those who traditionally have faced barriers in accessing credit, capital and other resources) at greater risk of being left behind. We take an assets-based approach to understand business owners' strengths and challenges in adopting and using digital technologies. We then implement a community-based intervention—Community Tech Workers (CTWs)—to bridge the growing socio-technical gap in the context of small businesses on Detroit's Eastside, which are primarily Black-women-owned businesses. We take a mixed-methods approach, using a combination of a survey, interviews, and observations, to outline how the CTW program 1) helps businesses determine where to start with technology use, 2) offers support grounded in the day-to-day realities of running a business, and 3) builds caring relationships with business owners to foster trust in technology support services. We suggest opportunities for a more collective perspective on assets-based community development and outline considerations for building culturally-conscious ecosystems of support for digital engagement.

CCS Concepts: • **Human-centered computing → Empirical studies in HCI**.

Additional Key Words and Phrases: Small businesses, entrepreneurship, assets-based community development, community-based research, digital engagement, underserved, Black-owned businesses

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1 INTRODUCTION

Small businesses–which made up 99.9% of U.S. businesses in 2022 [72]–are an economic lifeline, particularly for people of color [34]. Entrepreneurship is also a key interest in low-income populations because it provides a way to make a living on one's own terms while building up the community through local employment and investment [24, 48, 68]. In the past few years, digital engagement has become an increasingly integral part of small businesses' day-to-day work [6, 37, 58, 59].

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Entrepreneurs are now expected to balance their finances in accounting software, increase their online visibility through search engine optimization, and manage their publicity through social media. Free support platforms, like online courses, YouTube videos, and crowdfunding platforms, can help entrepreneurs connect with more resources and customers [36, 49, 50]. However, HCI researchers find that introducing more platforms to entrepreneurship is not necessarily closing the socio-economic gap but potentially making it wider [26, 46]. As digital technologies become more integrated into the everyday tasks of running a business, underserved minority[1] business owners are at greater risk of being left behind [6, 46, 74, 80].

Black business owners, in particular, face greater barriers to accessing digital tools [97], have less access to financial capital that could pay for technology support services [12, 31, 84], are less likely to have strong entrepreneurial support networks who can provide advice [32], and in general face greater everyday adversity [33], all of which limit the time and effort they can dedicate to technology adoption and maintenance [42]. Particularly because of COVID-19, underserved minority small business owners are now acutely aware of the importance of digital engagement but often don't know how to get started [11]. While these challenges are a symptom of wider historical inequalities [10], we seek to understand how to support the adoption of digital technologies in a way that acknowledges the everyday realities of underserved minority business owners.

Rather than developing more tools in hopes that business owners will eventually adopt them in their own time, we seek to understand the gaps in supporting digital engagement and how a community-based program can help bridge these gaps. We started this work by asking the following research question: *How might a community-based intervention address the challenges underserved minority business owners face in adopting and using digital technologies?* In answering this question, we address the following sub-questions: *What are business owners' strengths and challenges to becoming digitally engaged?* And, *How could a community-based intervention leverage these strengths to overcome challenges to digital engagement?*

By digitally engaged, we refer to the capacities needed to identify, adopt, and maintain the usage of digital technologies. This definition is informed by related terms like digital readiness, which emphasize the skills needed to use and discern the trustworthiness of digital tools [45], and digital literacy, which more broadly encompasses the skills needed to use digital technologies, primarily via the Internet, for learning, work, and fun [7, 73]. We study digital engagement specifically in the context of underserved minority small businesses, paying particular attention to the capacities needed to *start* and *maintain* digital technology usage over time, which is critical given that technology in underserved contexts is more likely to be broken, shared, and unstable [42, 43]. While significant research has outlined the factors needed for technology adoption among underserved minority business owners [76], we focus on what can be done when some of these factors are missing.

Our goal was to develop an intervention that leverages and strengthens community assets in an Eastside Detroit neighborhood facing barriers to digital literacy, among other core challenges, like being under-capitalized and having limited transportation. Our team consisted of a neighborhood organization on Detroit's Eastside, a university-based program that supports Detroit businesses, and university researchers, drawing from a collective 52 years of experience working with underserved businesses. We were motivated by community-based research [44, 53], focusing on assets-based approaches to design and development [2, 22, 35, 52, 63, 65, 75, 100, 102, 103], given its emphasis on sustainability through leveraging and growing the strengths of the community.

[1]The term "underserved minority" is the language chosen by our community partner. We define "underserved minority business owners" as "communities and populations that traditionally have faced barriers in accessing credit, capital and the other tools they need to start and grow businesses...These communities may include populations such as women, minorities, veterans, tribal groups and others" [5].

The goals of this wider project are three-fold: 1) To strengthen the small business/entrepreneurial ecosystem of support for digital engagement in an underserved, primarily Black, community by 2) introducing a community-based intervention that scaffolds digital engagement for business owners, which in turn 3) provides employment and career pathways in technology-based jobs for tech support workers. Given the size of this project, we focus this paper on just the first and second goals while leaving the analysis of tech worker training for future work. The community-based intervention–called the Community Tech Workers (CTWs)– employs a mix of Eastside Detroit residents and university students primarily from the greater Detroit area to serve as readily-available technology guides for small businesses in Detroit's Eastside, which are mostly Black-women-owned businesses. We took a mixed-methods approach involving a survey, interviews, and observations to address our research goals. Our empirical findings indicate that to foster digital engagement among underserved minority small business owners, the entrepreneurial ecosystem of support must be able to 1) bridge the gap to knowing where to start, 2) offer support grounded in the day-to-day realities of running a business, and 3) establish trust between business owners and tech support personnel. We believe this initial study of the CTW program contributes a new model for strengthening the community-based ecosystem of technology support for minority businesses in an underserved area [39].

2 RELATED WORK

2.1 Challenges of Digital Engagement Among Underserved Minority Small Businesses

Digital technology use for small businesses is challenging both domestically and internationally [6, 26, 46]. Technology adoption, if successful, could drive innovations in minority and ethnic small business communities and enable entrepreneurs to create value and make more money [30, 76]. However, technology adoption by minority and ethnic small business owners is more challenging [76]. These challenges include implementation difficulties due to resource constraints [77], limited inclination to invest in such systems despite the business value [9, 74], knowledge barriers [94], staff resistance and poor infrastructure [46]. Recent work in CSCW has uncovered similar challenges after a decade and a half [58].

However, many Black-owned businesses do not have the funding to pay for digitalization services [8, 97]– a theme seen in HCI research on technology maintenance in underserved communities more widely [41, 42, 90]. Accessing and maintaining technologies requires constant financial investment, like paying for upgrades and repairs, and relational resources, like knowing people who can loan a computer or phone [42, 43, 82]. Intervention-wise, Baboolall, et al. suggest that "free or subsidized installation, tech support, and staff training can help Black-owned businesses acquire more digital capabilities and become more able to share this knowledge with other Black-owned businesses in their communities." [8, p.12]. They also suggest that community programs could connect Black entrepreneurs with commercial networks and role models to help them feel more support and confidence. Because we tend to move toward people we view to be similar, representation in mentorship, networking, and sponsorship can help entrepreneurs quell some sociocultural barriers [8, p. 12].

One of the goals of this work is to pilot a program to support the digital needs of small businesses in Detroit's Eastside, primarily underserved Black-owned businesses. We draw insights from past community social informatics, entrepreneurship, and HCI interventions to frame how we provide digital support. Social informatics and HCI research push us to consider how technology engagement exists beyond just the hardware and software [1, 85, 86, 94]. We must consider technology within a specific context that includes social support, organizational support, financial and technology resources, and the various relationships and roles with each other [47, 67]. For instance, prior

research has found that in lean economies, there should be a greater focus on expanding the non-technological supports for small business owners (i.e., social support groups) to scaffold technology use [26, 46]. These systems (i.e., social systems and technology) continuously shape each other and are critical to consider when rethinking the support ecosystem for digital engagement.

2.2 Approaches to Digital Engagement in Underserved Contexts

Approaches to fostering digital engagement in underserved contexts have continued to evolve over the past two decades. Initially, initiatives that provided technology (e.g., One Laptop per Child [96]) were seen as cutting-edge interventions with the idea that if provided with technology, people could adopt and use it on their own. Since then, researchers have critiqued these techno-centric solutions for their overly simplistic approaches, explaining that just providing technology does not inherently lift people out of poverty and, in some cases, creates more waste and lost opportunity to fund more critical challenges [38, 90, 95]. Students provided with just a laptop do not automatically use them to study [96], neighborhoods provided with Internet cafes do not automatically use them to search for jobs or take classes online [15], and the masses provided with free or low-cost online courses do not regularly complete them at their leisure [25]. Unfortunately, we see a similar sense of techno-solutionism in the entrepreneurial space, where there is a growth in entrepreneurial support tools combined with interventions that provide access with limited guidance [46]. More recently, HCI researchers have pushed for community-based approaches to fostering digital engagement that emphasize a more holistic understanding of communities, equitable partnerships, and assets-based lenses to engagement [22, 27, 60, 75, 100, 102, 103]. Various models of digital engagement point to socio-technical infrastructures. For instance, this includes physical infrastructures, like reliable Internet and electrical systems access, and social and organizational infrastructures, like knowledge networks and peer support [55]. In many cases, the social infrastructures were seen as critical for fostering an environment where people were motivated to use technology in new ways [18, 46, 86]. In entrepreneurial contexts, cohorts of learners are particularly helpful [46] by supporting key factors needed for ICT adoption, such as perceived ease of use, attitude about technology, and belief that one could succeed in using technologies [76, 79].

2.2.1 Assets-based Community Development. HCI researchers have promoted assets-based approaches to fostering digital engagement that builds on the existing strengths of the community [2, 22, 35, 52, 57, 60, 75, 100, 102, 103]. Assets-based approaches share similar values to other community-based approaches, like community-based participatory research that highlights equitable community engagement through the project process [44, 53], and care-based approaches that emphasize a relationship of care when engaging with community partners [57, 66]. Specifically, assets-based approaches seek to understand and leverage a community's assets—also referred to as capacities and strengths—in the process of technology or intervention design and implementation [63–65].

Unlike alternative approaches, which start from the perspective of a community's needs or deficits, assets-based approaches consider how to strengthen a community's existing assets so that the proposed intervention is more likely to be sustainable. For instance, in HCI research, this might involve understanding how immigrant parents support their children's education and leverage their existing social practices to inform the design of socio-technical tools for improving school-parent relationships [101, 103, 104] and learning support tools [22]. Another example includes understanding the assets of human trafficking survivors and leveraging the strength of their interpersonal bonds to inform the design of technologies that facilitate greater interconnectedness and mutual learning [103]. Similar to this prior work, we started our research with an understanding of the experiences of underserved small business owners and introduced a community-based

intervention that employs (and grows) the capacities of residents. Few have applied an assets-based approach to fostering digital engagement among underserved minority business owners in the U.S. We build on prior assets-based work to inform our choice of invention, engagement with the community, and perspective on longer-term sustainability.

3 METHODS

3.1 Context and Motivation

Over the past years, the COVID-19 pandemic deepened a digital divide among small businesses, especially among minority-owned businesses [11]. Between 2019 and 2020, consumers increased their online shopping by 43% [13]. People have come to expect that businesses of all sizes and types will offer seamless online ordering and fast, reliable delivery – preferably with a well-developed, user-tested digital platform. In our team's work with Detroit small businesses, we have observed that illnesses, labor shortages, and decreased revenues have forced business owners to acknowledge the key role of using digital tools in keeping their businesses afloat.

In Detroit's East Jefferson corridor, more than 500 micro-enterprises are clustered in five historic Detroit neighborhoods, most within walking distance. Most are Black-women-owned, with the most common business types being restaurants, retail, and now, e-commerce. Through our direct work, we know that the owners of no-tech or low-tech businesses struggle to integrate technology into their business operations, resulting in lower profitability. Many businesses do not have a web presence at all. Yet, very few resources are available to help onboard business owners to digital technologies in a way that works with their schedule.

The neighborhood where we work represents a particularly rich opportunity for an intervention that facilitates digital engagement. According to 2018 U.S. Census data, 45% of the residents live below the poverty line, and 52% of working-age people are not in the labor force. This translates into long commutes for low wages: 29% of residents drive more than 25 miles to their primary job, where they earn less than $1,250 per month [14]. The research team's prior work in this area has found that despite being located within the growing city of Detroit, this neighborhood continues to be under-resourced and under-capitalized in terms of business funding and digital literacy support.

3.2 Approach and Community Tech Worker Model

Community-based approaches inspired us with a primary focus on assets-based design and development. First, we believe the project should equitably involve all stakeholders (e.g., community partners and researchers) throughout the research process [44, 53]. This collaborative approach set the groundwork for creating a community-university partnership that balanced expectations, responsibilities, and effort. We acknowledge that taking an assets-based approach does not mean ignoring challenges the community faces but rather starting the project with an eye toward the community's strengths. We believe this approach informed a way of working that would foster the sustainability of the Community Tech Workers project. We aimed to create a community-based intervention that would become part of the fabric of initiatives sustained by local organizations and endorsed by residents invested in grassroots-driven socio-economic mobility.

We launched the Community Tech Worker (CTW) program to expand Detroit's digital infrastructure for small businesses by recruiting, training, and placing dedicated tech workers within a community development organization to assess local businesses' technology needs and then provide 1:1 support. The CTW program extended prior efforts on Detroit's Eastside to provide residents with similar support [60]. The CTW program was inspired by the long-established Community Health Worker (CHW) model, where "community members who serve as connectors between health care consumers and providers promote health among groups that have traditionally lacked adequate

access to care" [62]. CHWs typically share ethnicity, socioeconomic status, life experiences, and language with the community members they serve. The Community Health Worker model has been used to improve health outcomes among underserved populations and reduce health disparities [40, 93, 98]. Our CTW program follows these community-based principles of the original CHW model by employing tech workers, some local to the neighborhood and others from the greater Detroit area, and training them to provide support in a culturally competent way.

Given the community-university partnership, we recruited a mix of residents from Detroit's Eastside and university students as community tech workers. We expected locally recruited CTWs to be able to share local knowledge of the business context and surrounding culture. In turn, university-based CTWs would be able to provide knowledge about project management from their classes. We believed these respective assets of CTWs would complement each other and serve as a valuable partnership in the field.

3.3 Project Team Development

This project was set in motion when the University of Michigan Detroit Neighborhood Entrepreneurs Project (DNEP) brought forward a funding opportunity dedicated to supporting the needs of Detroit small businesses. DNEP had been in conversation with some of the faculty on this project about possible work together in this area. They convened a series of conversations about co-developing an initiative to support the technology needs of Detroit businesses and what the project might involve. We landed on piloting the Community Tech Worker idea in the context of supporting small business technology needs but deliberately left open many details until we chose a community partner who would contribute their ideas. The Community Tech Worker project was piloted in a public housing community on Detroit's Eastside the year before to support the digital literacy of older adults [60]. Given the pilot's initial success, we felt that this approach was the most promising out of ideas, given its focus on leveraging and developing community capacities and assets through local employment and the socio-economic development of businesses.

After analyzing Census data related to household income, commuting distances, and geographic concentration of micro-businesses to assess which Detroit neighborhoods could benefit most from strengthened small businesses, DNEP created a short list and then leveraged its extensive network to narrow the list of possible community organizations to those partners who were known to be trusted connectors in those neighborhoods, with stable staffing, a physical space large enough to accommodate CTWs and client meetings, and a large concentration of businesses within walking distance of that central workspace. Based on these criteria, we narrowed the list to only three prospects. One of the organizations, Jefferson East, Inc., proved to be a more desirable match because it was opening a new, large resource hub on Detroit's Eastside, and it had already begun work on the digital divide issue by seeking out grant funding to build the corridor's digital infrastructure. This upfront vetting process across potential university PIs and community organizations helped establish a team of practitioners and researchers dedicated to equitable community engagement and investment in the projects' sustainability.

3.4 Community Tech Worker Recruitment, Training, and Deployment

We have employed seven CTWs between the ages of 20 and 21, with a preference for those originally from the Detroit area. All were chosen based on their technology skills, communication ability, and interest in community development. The CTW position was each of their first full-time jobs in a technology field. CTWs were trained over two months in the Summer of 2022, during which they learned digital skills, client social skills, cultural competency, and career readiness. These topics were informed by interviews with small business support organizations and the project team's collective experience working with underserved businesses. Digital skills were learned through

self-directed, freely available online modules covering the following topics: Websites, social media, point-of-sale systems, content design, web business profiles, web ads, online scheduling tools, project management tools, search engine optimization, and cybersecurity. Client social skills were developed through mock client engagements led by the community leader, PIs, and guest speakers (e.g., leaders of local business support organizations and business owners). Cultural competency was taught through regular conversations with the community partner on socio-economic divide, race, and gentrification issues. Finally, career readiness was supported by bringing guest speakers who represented various careers that CTWs could pursue. Guest speakers included leaders of small business support organizations, community leaders, small business owners, IT and media specialists, and researchers. This study will not go into the details of this training, which we aim to address in future work. Still, we hope the findings explain how this combination of CTW skills influenced relationship development with business owners.

CTWs were deployed at the end of July 2022 and have been working with business owners since. Upon engaging with business owners, CTWs were quick to co-develop a script to set expectations with clients in their first client meeting: "To clarify, our responsibilities as Community Tech Workers is to research and identify the best platforms for businesses and their needs, walking you through the setup and mechanics of said platforms while troubleshooting any issues. While we are qualified, our goal is not to become your employee for technical needs but to provide you with the skills as a business owner to be able to independently solve your issues in the future. If there are any needs you have outside the technological scope, feel free to share this with us so we can refer you to someone else in that sector." This statement reinforced that the goal of the CTW service was to support business owners in developing their digital capacities rather than serving as a technologist for hire.

3.5 Data Collection

We took a mixed-methods approach in which we surveyed 128 business owners, interviewed eight representatives of business support organizations, and performed 240 hours of observations over seven months. Members of the project team distributed the survey through the community partner listserv, listservs of local business service organizations, and the project team's network of businesses. We recruited business service representatives for interviews by leveraging the team's existing network of connections and requesting a 1-hour interview with the organization's member who is most knowledgeable about supporting small businesses. We observed interviews with business owners conducted via public panels by the community partner members of our project team. We informed the development of interview questions for the public panels, which were led by our community partner, and used this interview data to avoid taking more of the business owners' time. Fieldwork included observations of client meetings, client panels, and CTW daily work and training. From observations, we distilled key takeaways into summary memos, which we used to inform our data analysis. Finally, we also reviewed log data of support requests from the CTWs project management platform, Asana, in which CTWs logged client notes and progress. This helped us understand the extent of support provided to businesses and any additional information not captured by the other forms of data collection.

3.6 Data Analysis

Data analysis was performed by three of the authors, given their research role in the project team. We shared emergent codes, themes, and quantitative findings with the wider project team throughout the analysis process for feedback. To answer our initial research question, *How might a community-based intervention* address the challenges underserved minority business owners face in adopting and using digital technologies? We first sought to understand the context of

business owners' technology aspirations. From our survey data, we reported frequencies around business owners' current technology use and future technology goals. For instance, we report on the percentage of business owners currently using certain technologies and the proportion interested in adopting new technologies. Understanding what business owners' current technology landscape looks like and what they hope to adopt helped us shape our implementation of the CTW program.

To further address our initial research question, we realized the need to answer the following sub-questions: *What are business owners' strengths and challenges to becoming digitally engaged?* And, *How could a community-based intervention leverage these strengths to overcome challenges to digital engagement?* First, to identify business owners' strengths and challenges, we performed iterative thematic coding [23]. We started by reading and re-reading the wide range of qualitative data collected in this project, including field notes, summary memos, answers to open-ended survey questions, and interviews to gain a general overall understanding of business owners' experiences from various perspectives. We then used a combination of provisional and open coding [83] to analyze the data informed by assets-based design and development principles.

Using principles of assets-based approaches as a framework for our analysis meant acknowledging business owners' challenges while identifying how they overcame such hurdles, thus emphasizing their *transformation* throughout the project. For instance, we first coded for challenges by identifying instances where business owners and support organizations expressed obstacles to becoming digitally engaged. This included resource-based challenges outlined in prior work like limited financial and social capital [12, 31–33, 84]. We also uncovered additional challenges, like not knowing how to get started, challenges with maintaining technology use, and distrust of technology support services. These challenges have been less often identified in prior work on underserved minority small businesses and form the structure of our Findings. We then performed a second round of coding to identify the business owners' strengths and capabilities. This often meant, for example, reading field notes where a challenge was described (e.g., being unable to update a website) and identifying instead how a business owner demonstrated skills, strategies, or priorities that could be thought of as resourceful or otherwise indicative of competence in business. From this analysis, we outlined business owners' work ethic and commitment to their business survival, which uncovered the ability to prioritize everyday tasks and maintain hesitance around technology adoption due to costs and time.

To address the second sub-research question and the efficacy of the community-based intervention—Community Tech Workers—we performed a third round of coding by identifying all instances where CTWs were mentioned in context with the challenges and strengths described in the earlier analysis. This coding round helped identify how CTWs supported technology onboarding by scaffolding initial adoption tasks, technology maintenance by working within the business owners' schedules and trusting relationships through on-the-ground engagement and cultural competency. From the project management log data, we counted frequencies of how often CTWs engaged with businesses and what tasks they worked on together.

4 FINDINGS

As of April 2023, the CTW program has served 118 small businesses on Detroit's Eastside, the majority of whom are Black-owned, so far composing over 860 completed ticket items. Ticket items included individual tasks for each business, such as researching appropriate technologies and figuring out how to streamline multiple social media accounts. In the initial survey, business owners expressed a strong desire to use digital tools, primarily websites, social media, and content design. Through observations, we found that challenges to digital engagement include overcoming the gap to getting started, maintaining technology and digital engagement long-term, and building

trust with tech support services. The CTW model helped address these challenges by guiding business owners in choosing the appropriate technologies and helping them get started, working within the business owners' hectic schedules, and demonstrating understanding and patience with business owners as they learned digital skills.

4.1 Digital Technology Goals of Small Business Owners in Detroit's East Side

We received 128 responses from business owners who expressed interest in the CTW service and shared their technology goals. Using the Bureau of Labor and Statistics North American Industry Classification System, businesses were a mix from fifteen different business sectors: retail trade (26), accommodation and food services (e.g., restaurants) (12), arts, entertainment and recreation (11), healthcare and social assistance (10), professional and technical services (e.g., consulting) (7), financial and insurance (6), information (e.g., publishing and technology) (5), construction (2), wholesale trade (2), agriculture (1), management of companies (1), real estate (1), and other services (e.g., salons, pet care and faith organizations) (13). They were mostly microbusinesses with 0-2 employees (76) or 3-5 employees (19); others were slightly larger with 6-10 employees (4) and 11 or more (3 responses). All participants who responded to the survey identified as a "small business." Mostly reported yearly revenues of $0-25k (61), with some reporting revenues of $25-50k (18), $50-100k (3), $100-250k (8), and >$250k (5).

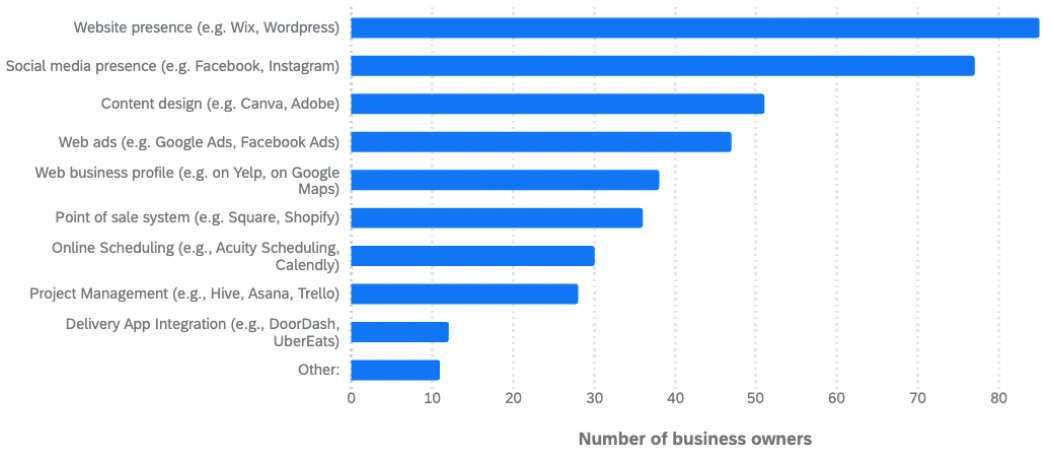

Fig. 1. Top digital technologies business owners hope to improve. Business owners were encouraged to select their top three choices.

The top three technology support requests included improving their website (65.42%), social media presence (58.87%), and content design (38.31%) (Figure 1). We also asked what tools business owners used and which they were interested in adopting. 57% of business owners shared that they were actively using social media. However, less than 50% of businesses used other digital tools like a website, point of sale systems, bookkeeping systems, etc. (Figure 2). This makes sense, considering that most of the respondents reported performing most of their work through mobile phones where social media management is relatively accessible (Figure 3), whereas managing more complex digital tools, like bookkeeping or web editing tools, is likely more challenging. The most popular tools that businesses were interested in using but had not adopted yet included web ads (62.85%), project management tools (58.09%), and online scheduling tools (56.19%), suggesting that

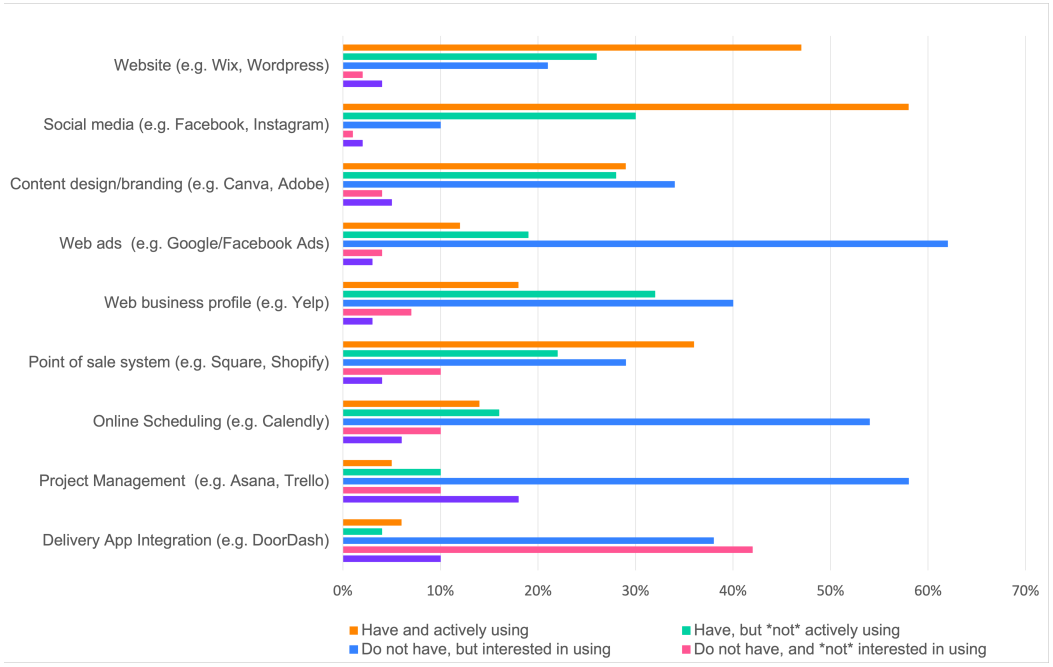

Fig. 2. Technologies that business owners currently use and are interested in using.

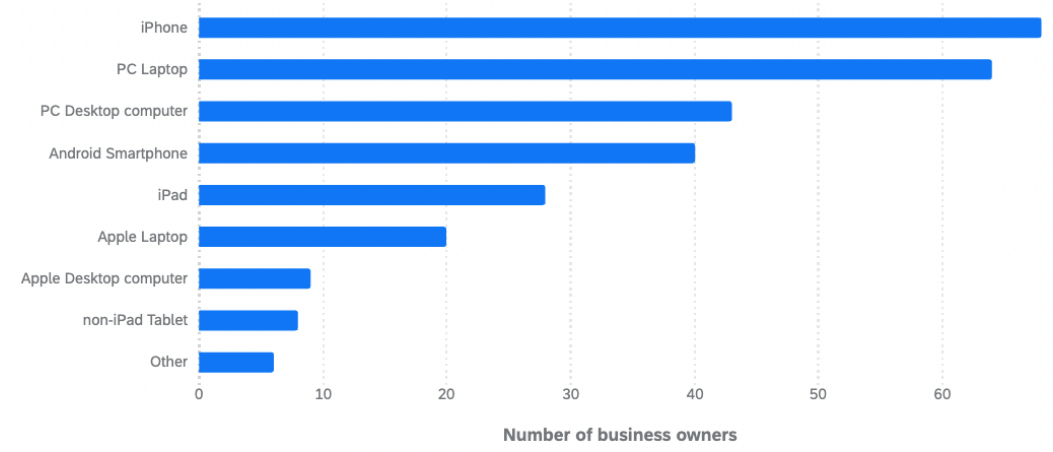

Fig. 3. Devices that business owners use to conduct their work. Business owners could select more than one choice. The average number of devices used was between two and three.

businesses were interested in additional ways to bring in more customers, organize their work, and manage their customers (Figure 2).

Our survey also shows that business owners are pretty self-reliant in trying to figure out their own technology challenges. The majority shared that they turn to web search (78.5%) or watch an online video (e.g., Youtube)(59.81%) to try and figure out technology questions on their own (Figure

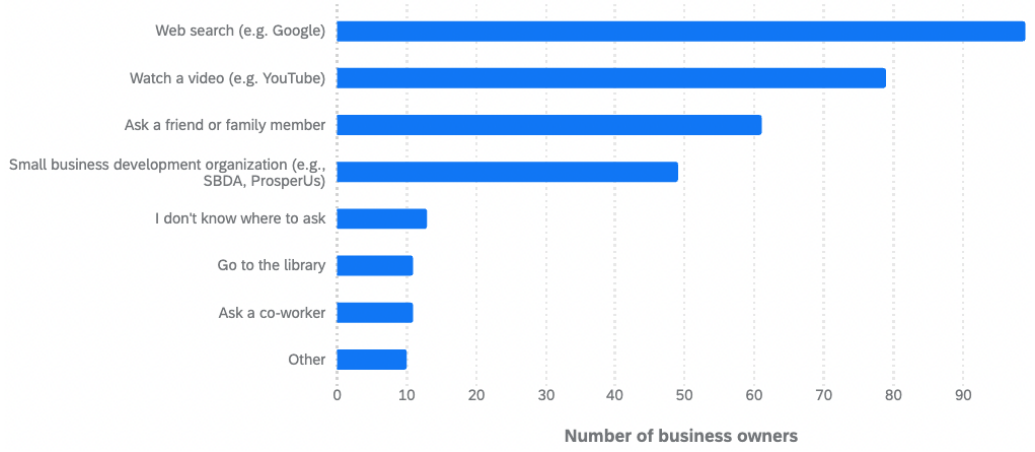

Fig. 4. Where business owners turn to for help if they have a technology-related question. Business owners were encouraged to select their top three choices.

4). Less than 50% shared that they would ask a family member or friend if they had a question and even fewer turned to other resources like small business support organizations or the library. Given the relatively low adoption of digital tools in this region and the primary use of web search, this further suggests opportunities for accessible on-demand tech support services, like CTWs.

Research done by other business support organizations has found a similar need for accessible technology support services, sharing that their constituents want to use digital tools, but few have successfully made the leap to adoption. As one business support organization representative shared,

> "When we do our surveys, we say, 'Do you see the value of a website directly?' Almost everybody says yes, and yet only a third of them are online or active… [It was] not a lack of desire." -Sarah

Given our initial understanding of small business owners' digital technology goals, we informed the CTW training around these topics. We then set out to evaluate whether and how the CTW program supported the digital engagement process.

4.2 Bridging the Gap to Knowing Where to Start

Of the businesses supported so far, about half came into their first CTW meeting having attempted to address their technology goals on their own. We found that the technology use and adoption gap was not from a lack of interest or capacity to learn but because of limited time and hesitance around trying new tools. Businesses were expected to become digitally engaged under particularly hectic conditions. They spent most of their day managing operations, engaging with customers, and generally keeping everything afloat, leaving little time to learn new technologies on their own. While business owners were aware of the benefits of using digital tools in making their work more organized and efficient, the cost of figuring out how to get started was often seen as too high, making adopting new technologies often last on their list. By engaging with CTWs, business owners could minimize the time lost researching and troubleshooting technologies. They preferred to explain their digital goals so that tech workers could direct them to the appropriate tools and help them get started. This is not to say that research and troubleshooting skills are not important. Rather, we found that scaffolding this process at the beginning of the small business

owners' journey helped ease the transition into using technologies and motivated them to become more engaged in the long term.

This initial work of knowing where to start was one of the key value adds of the CTW program. For instance, one leader of a business service organization expressed that knowing what technologies or resources to turn to first was one of the main challenges.

> "I think what is lacking at the moment is one coordinated structure that tells people where everything is because there are so many disjointed things that are going on…having one library of what everything is, I think, would be extremely helpful." -Mirita

It is often difficult for business owners to know what resource is appropriate for their particular technology needs. For instance, some businesses knew how to create a website but did not know how to design content, like a logo. Rather than directing the business owner to a multi-day course on graphic design, which would provide too much information and take up too much time, CTWs directed the business owner to local services like Detroit Design Core if they had the funds or an online content creation platform like Canva if their design needs were simpler.

Through the following vignette, we describe how CTWs could scaffold the process of getting started on various digital platforms. In this scenario, the small business owner was aware of some digital tools but benefited from being guided one-on-one through getting started.

> *Nicki runs a snow cone business for which she currently has a food truck and is in the process of setting up a local storefront. She is interested in improving her social media presence. In her first meeting in late July, the tech workers discovered that she had been paying a subscription to the content creation platform Canva for over a year and had never used it. They walk her through how to use the platform for editing her website and creating social media posts. Nicki is excited about learning this new tool and exclaims, "I'm going to finish this tonight. I'm going to play with it, and then I'm going to post it!" Over the next few weeks, Nicki becomes more proficient with creating content in Canva and scheduling social media posts on Facebook and Twitter. She contacts the tech workers over text with questions as needed.*
>
> *As she becomes more comfortable using digital tools, she inquires about other tech opportunities, like setting up a business line on her cell phone and inventory management tools. By September, only five meetings later, she had learned how to use Canva to create and post social media content, set up a new phone system, and moved her paper-based inventory to an online management system. Despite her limited bandwidth, she acknowledges the importance of learning digital skills—"I don't have the time, but I love the fact that I know it. So, if they [employees] can't get to it, then I need to put this in myself. And this can be in my spare time, and just be able to go in, knowing that I have that knowledge. I do want to learn it, and I have learned it."*

Nicki's story emphasizes that she can use digital tools and even made early attempts to get started. She goes on to describe that the reason she initially paid for Canva was that her brother had recommended it but did not have the patience to teach her how to use it: "He just click click click and finished. He's not patient. I'm a hands-on person. I need to walk through it myself." Given the constraints of running a business, she had limited time to learn the platform on her own. The CTWs provided a positive experience with getting started, which opened up further possibilities for technology use.

We also point out that Nicki had the funds to hire someone who could manage the business's technology needs, but she has had trouble keeping anyone employed. Within the first two weeks

of meeting the CTWs, the person she had hired to manage her digital content quit, and she had to go back to managing the digital aspects of her business herself. She and many other businesses expressed that even though digital engagement was not what they had in mind as part of their daily responsibilities, they knew they would have to learn the basics without dedicated staff. Business owners often did not see their roles or themselves as technologists and would rather hire someone to do this. Therefore, they were less inclined to invest time into taking introductory classes or workshops on digital skills. While such courses would be beneficial, they expressed that what would help them become digitally engaged was being provided accessible opportunities to solve the digital needs specific to their business. For instance, one leader of a business service organization explained,

> "What businesses actually want and need, in many cases, is not just a consultation, it's not, you know, a webinar, it's one-on-one support to get the things done. So, you have a consultation, and part of what's recommended is that you update your hours on Yelp, or on Google, or whatever. How does that person then actually implement it? Some people are more, you know, digitally skilled than others. But, a lot of the neighborhood business owners, especially if they're older, just may not have the know-how or tech savvy to navigate that." -Amara

Amara explains that the types of available digital support to get started do not fit within the day-to-day realities of small business owners. Many consultations provided by business service organizations, like the local Small Business Association (SBA) or Small Business Development Corporation (SBDC) chapters, provide advice on what businesses need to do but not how to use the technologies themselves. Conversely, local entrepreneurship education programs might teach a multi-day course on creating a website or using social media but do not answer a question specific to the business's needs. As another business service organization expressed, "Often people don't want to take the class; they just want to know how to do a particular thing." Amara expressed that on-demand support for a business-specific need is more likely to be used.

The assets of small businesses in this neighborhood include a significant work ethic and dedication to their business success. While they all expressed a list of technology challenges that make their work harder, a few meetings with tech workers were enough to get them started on troubleshooting themselves. We found that the biggest hurdle was deciding what technologies to use and figuring out what tutorials to follow. With the CTW program, tech workers can do much of the background research for business, identify realistic pricing, and determine the steps to get started. From here, businesses expressed being less intimidated by technology and were eager to learn more. In sum, we find that once businesses overcame the challenge of getting started, driven primarily by lack of time and the resulting incompatibility with existing training resources, businesses could use technology and gain confidence to broaden the scope of technology use in their operations.

4.3 Offering Support Grounded in Day-to-day Realities

Even if business owners manage to get started with using new technologies, new issues arise regularly. Both business owners and business service organizations have found that introductory courses may be one solution to getting started, but they are not sustainable. As one leader of a business service organization described, they have spent significant resources over the past years getting small businesses set up with a website. But, they found that business owners often could not maintain their usage when the class ended.

> "We've had programs where we offer, say, 100 opportunities or grants for business owners to get a website, and then they get the website. And they don't know how to run the website or maintain the website. And so after the program is over, they need that

> technical assistance; they need somebody else to go in there and update it and teach them how to use it. And so there's no long-term assistance for that, you know… There aren't enough programs, and they're not comprehensive, like, they maybe will start on one thing, which is great. But at the end of the day, they were short-term benefits for the business owner." -Latonya

Acknowledging the reality of these small business owners, CTWs were introduced as a way to guide technology engagement within the constraints of small business life. In about half the cases, CTWs were asked to address challenges with maintaining existing technology, whether that was a website someone else created for them or organizing social media platforms that multiple people, usually friends and family, have set up in the past. In the following vignette, one restaurant business owner contacted the CTWs to help him update the menus on the screens displayed in his restaurant.

> *Paul owns a restaurant that serves smoothies from one counter and grilled food from another. The menus currently on the screens are not up to date because he cannot figure out how to change the displayed items himself. He hired someone when he first launched his restaurant to display his menu on the monitors. But since then, every time he wants to add or delete an item, he is charged $100-$200. He wants to learn how to make these changes himself as the cost of updating is adding up. When he first meets with the CTWs, he is so fed up that he suggests throwing away the screens and reinstalling new ones to have a fresh start. The CTWs dissuade him from throwing away six perfectly functional screens and researching how the menus are created and displayed.*
>
> *In a follow-up meeting, they aim to show Paul how to log into Canva and update his menu, save the menu on a USB device, and upload it to the screens. They estimate the whole session would take about one hour. However, the realities of everyday business get in the way. Paul has forgotten his Canva password and must contact another employee to get the information. One hour later, he can log into Canva, but his computer promptly dies because there are no outlets to charge it nearby. Within this time, the CTWs offered to show him how to use Canva on their own laptop. But, during this process, he is interrupted by staff and customers four to five times, which forces him to leave and attend to business needs in the middle of the session. By the end of the hour, he has only been able to log into Canva and does not yet have a good understanding of how to edit the menu—the first item on the CTWs list of tasks for the meeting. The CTWs then set up three more follow-up meetings.*

This vignette demonstrates that each task would take much less time to complete if business owners could work on them uninterrupted, which is rarely the case. If Paul had to research how to make these changes himself, it would have taken even more time. This is the reason he has not troubleshot the technology himself and has instead chosen to spend hundreds of dollars for someone else to make the changes. In this case, Paul would not have had time to take a technology workshop to figure out this problem as he barely had time to walk through a one-on-one tutorial in his intermittent downtime. Instead, the CTWs were flexible in working with Paul, starting and stopping when other work pulled him away and returning as needed. They worked around Paul's busy schedule, letting him focus on his first priority—running the business.

Various business owners expressed similar frustrations, explaining that the work to maintain their digital engagement was overwhelming and time-consuming. One representative of a business support organization shared that she, and many others, are highly aware of these challenges but have not identified a solution. She provided one example from a client who owns a bakery:

> "I'm one person who knows how to bake cakes, I don't know how to manage your website, I don't know how to do social media, I don't know how to do these things. You can give me links to 10 websites to teach me how to do this. But I'm one person, and the cake still needs to be baked…That's where the gap is." - Amara

Again, the lack of time is a prominent hindrance to being digitally engaged. Businesses are sometimes sold on the vision that a few classes are enough to easily become a digitally-engaged entrepreneur. However, they realize that taking steps to use a new application only introduces new questions and challenges that ultimately become more expensive and time-consuming. For instance, this was also shown in the first vignette when Nicki described how her brother convinced her to pay for a Canva subscription, which she did not use for over a year. For Paul, in the second vignette, he decided to display his menu on screens throughout his restaurant, believing that it would be easier to update. Instead, he did not know how to update the screens himself and ended up spending $100-200 every time he wanted to make a change.

These stories exemplify that when given the time needed to become digitally engaged, business owners clearly benefit. However, small business owners, especially those who are underserved minorities, are less likely to have access to the time and resources needed to become digitally engaged easily [74]. Instead, they are aware that technologies are beneficial and are sometimes convinced to invest in new applications or take a class but are then stuck with the cost of technology maintenance without support that fit the realities of their day-to-day life.

Our CTW model placed importance on being responsive to business owners' needs, and one of the ways this manifested was through being respectful of the business owners' other time commitments and tasks. Being able to come back multiple times to address a business's technology needs will likely be a reality for any technology service provider.

4.4 Building Trust with Technology Support Services

Finally, even if small business owners are aware of the benefits of technology, they are wary of the time and costs of becoming digitally engaged. Given the reality of having limited time and resources, it is reasonable to see why underserved minority business owners have put off becoming digitally engaged in the first place. One leader of a business support organization expressed the importance of a community-based approach to launching digital support services in underserved neighborhoods in Detroit:

> "You got to go foot to pavement and say, 'Hey, we're here, this is what we do'…Most people don't necessarily want to go into community and spend the time that's necessary to work with the business and have patience with them. Also, there's that element of cultural competency and sensitivity and being able to communicate with people where they are. And so the trust is another thing." -Karenna

As mentioned before, small business owners are not always aware of the resources available to them. But, even if they are available, they do not always reach out for various reasons, such as trust in the resources, time constraints, and lack of understanding of the process. Karenna expressed that even though small businesses are in need of technology support in Detroit, they are not always going to sign up for the service, even if it is free. Rather, technology support services, like CTWs, must pitch their services to business owners in person and build up their reputations through the neighborhood over time.

Following these suggestions, CTWs leveraged their partnership with the community partner to set up opportunities to connect with business owners directly. They worked with staff at the community organization to walk door-to-door to share the CTW service while at the same time mapping the location, contact information, and hours of businesses to be displayed via a digital

map on the community partner's website. They also set up booths at multiple public events, such as the community partner's Summer Jazz Festival, Business Resource Fairs, and Detroit's Digital Inclusion Week, to present their work and sign up new clients. These opportunities to connect with interested business owners in person, rather than just through an email list announcement or flyer, helped put faces to services and build relationships with the CTW program. We found that this multi-faceted approach was important for developing trust with business owners who may have otherwise not signed up for the CTW service despite wanting digital support.

This relationship-building was facilitated by one of the key components of the CTW program's training— the emphasis on "cultural competency," which involved teaching CTWs to understand the day-to-day realities of underserved minority business, their socio-economic context and how that affects their access to resources and capital, and the historical injustices that have shaped their current context. Because half of the CTWs grew up in the neighborhood, they could grasp these concepts quickly because it was part of their daily life. Their personal knowledge of growing up on Detroit's East Side shaped how they engaged with local businesses and how local businesses perceived the CTW support. CTWs who were university students mostly from the greater Detroit area learned from local CTWs by listening to their stories and allowing them to often take the lead in client meetings. By centering an understanding of the business owners' stories and lived experiences, we found that CTWs were able to build connections with business owners so that they felt comfortable sharing their digital technology goals and challenges. For instance, in the following vignette, Jesalynn describes being self-conscious about not knowing much about technology. She expressed that the care CTWs showed in walking her through digital tools helped build her confidence and likelihood of returning to the service.

> *Jesalynn owns a hair accessory business, for which she holds parent-child craft classes and creates unique hair accessories sold at local markets and online. Jesalynn contacted the CTWs to help with web design and social media. Like Nicki (from the first vignette), Jesalynn expressed how she felt particularly comfortable walking through her technology challenges with the tech workers: "I remember in our meeting, there was some acronym, and she was able to explain it in layman's terms. For me, being able to say I don't know, and them being able to break it down, without me feeling super old was nice." Jesalynn also expressed the importance of learning technology oneself even with limited time, "Because of COVID, I quit my job. I know that social media is one of the first things to outsource. But there will be months where I can't make that payment. So if someone drops the ball, I have to pick up that ball. In the end of the day, we're responsible."*

Here, the CTWs treated Jesalynn with respect, explaining the technology to her in terms that she understood while at the same time not making her feel like she was "less than" for not knowing the terminology.

Often in the first meetings with CTWs, business owners come in flustered and annoyed with using technology, stating things like "I'm so confused, and now I'm frustrated. I just need to stop talking" or "I'm so not knowing in this world. I know this side [points to business] but not this side [points to laptop]. This is why I have you guys." CTWs learned to repeatedly express that not knowing technology is not the business owners' fault and that they have the capacity to learn. As one leader of a business service organization stated,

> "I think that it's often easy to miss how touchy of a subject it can be for someone to not know how to navigate the world from a digital perspective. And often, people will have a lot of shame associated with their lack of knowledge. And so sometimes group settings are not the easiest way for people to engage and to learn...I think [one-on-ones] are absolutely needs for people to be able to engage." -Mirita

Both businesses and business support organizations expressed that to foster responsible adoption of technology, support services must be knowledgeable about the realities of day-to-day business management, and the socio-economic context, have the patience to walk clients step-by-step, and be willing to meet business owners in their communities.

5 DISCUSSION

As stated earlier, two of our primary goals were 1) To strengthen the small business/entrepreneurial ecosystem by 2) introducing a community-based intervention that scaffolds digital engagement. To address these goals, we contributed the Community Tech Worker program as a way to support a) bridging the gap to getting started, b) maintaining technology within their time constraints, and c) establishing trust with technology support services. Our findings confirm prior work outlining myriad challenges to becoming digitally engaged among underserved business owners, including resource constraints [77, 99], knowledge barriers [94], and addressing the long tail of computing challenges [55, 58]. Many of these challenges are historical and structural [10] and cannot be fixed with one intervention. We recognize that larger initiatives at the state and national level must invest greater capital and infrastructural support into the most vulnerable communities [51]. Rather than these larger policy changes, which also need to happen, our study focuses on a grassroots-level intervention—called the Community Tech Workers— that engages local residents and community organizations to support digital engagement among local small businesses.

We started this project with the following research question: *How might a community-based intervention address the challenges underserved minority business owners face in adopting and using digital technologies?* Our findings uncovered that underserved minority business owners in Detroit were unsure where and how to get started with digital technologies, had limited bandwidth and resources needed to maintain technology use, and were hesitant to work with technology support services. To address these challenges, we introduced the Community Tech Workers as a free service focused on building trusted relationships with business owners to provide technology guidance in a way that works within the business' time and resource constraints. We find that businesses are interested in using a variety of digital technologies, including websites, social media, bookkeeping, and accounting, but don't always have the time and resources to get started. Through the CTW service, we find that it takes relatively few meetings with businesses to bridge the gap between figuring out which tools to use and building the confidence to continue using them on their own. Our work contributes to and extends related work on assets-based approaches to digital engagement by reflecting on how a more collective lens could grow community strengths and ultimately foster more sustainable ecosystems of support.

5.1 A Collective Perspective to Assets-Based Approaches

Throughout our study, we kept revisiting what it meant to take an assets-based approach in the context of supporting underserved minority small businesses. Prior work has outlined that an assets-based approach involves leveraging and strengthening the capacities of the constituents [2, 22, 35, 52, 63, 65, 75, 100, 102, 103]. Initially, for our team, this meant having the small business owners learn all aspects of digital engagement, from researching what tools to use to troubleshooting requirements for long-term maintenance—with some guidance from Community Tech Workers. As our project went on, we realized that this initial vision of assets-based development did not align with the realities and constraints of small businesses, as they repeatedly stated they did not have time to perform every task. In response, we had to reconsider what assets-based development meant at both an individual and community level.

Related work on assets-based approaches refers to collective efforts as "participant-to-participant mutual learning of how to critically analyze the assets available to them" [103]. In contrast to this

prior work, we consider how the community-based intervention, not just the participants, is part of the collective for which assets are built and strengthened. What we draw out from our work is not a "lack" or "inability" of small business owners to adopt new technologies, but rather how they overcome the challenges of working in an underserved context to achieve their technological goals. We highlight how small businesses perform this resilience given their contextual situation. For example, one strength is that businesses are strategic in how they prioritize day-to-day tasks needed to keep their businesses afloat. This often doesn't equate to spending significant time learning and adopting the latest technologies. CTWs, however, could step in to minimize gaps in digital onboarding. By having CTWs perform some of the more time-consuming aspects of digital engagement at first, like researching which tools to adopt and locating the most affordable resources, they were able to absorb some of the more burdensome aspects of digital engagement that are often performed only a handful of times. In doing so, business owners could maximize the effort spent on their businesses (assets) while learning about digital tools efficiently within their limited extra time (constraints). With this approach, we found that quicker "wins" with technology—scaffolded by CTW support—helped business owners build confidence early on, a phenomenon seen in both management [3] and education [4] contexts. Furthermore, working with CTWs to more efficiently adopt new technologies freed up time needed to connect with customers. For instance, we observed how business owners put customers first (i.e. attending to customers during a CTW meeting), even if it meant delaying technology updates that would help their profits in the long run. This prioritization of customer relationships is a strength, particularly in underserved communities where in-person connections are core to maintaining a tightly-knit community.

While assets-based approaches leverage the strengths of individuals, it does not necessarily mean ignoring their contextual challenges [57, 103]. The focus was not on forcing business owners to engage in all steps of the adoption process from the beginning, as if CTWs were an educational program solely for the training of business owners. If that were the goal, we would have proposed a course taught by technology experts. Rather we saw CTWs as part of the collective assets of the community, especially since some of them are from the local neighborhood and most are from the greater Detroit area. In turn, CTWs—all of whom had never had a technology-related job before but were motivated to learn and contribute to the community—were able to use these experiences to build their technical and professional skills, a facet of this project we plan to analyze further in future work. We believe that because both CTWs and businesses learn and benefit, this process will ultimately form the groundwork for a more sustainable community-based program for digital engagement.

By incorporating a collective perspective, we find that assets-based approaches to digital engagement can take alternative forms. This is particularly crucial considering that underserved minority business owners are less likely to have access to strong networks of professional support [32]. Research on traditional workplace contexts finds that people turn to peers and in-house tech support first for technology-related questions [71]. Conversely, our survey results show that business owners primarily turned to web-based resources, like Google and video tutorials, as their primary sources of information to answer technology questions—further confirming that underserved minority business owners have limited networks for professional guidance [32]. Prior work in HCI has shown extensive research on the opportunities and benefits of connecting virtually with experts with technical knowledge [20, 21, 56]. Similar to other HCI research studying digital engagement in underserved contexts, we find that business owners were not immediately comfortable connecting with unknown experts, especially online, and preferred to first engage in person [54]. This wariness is often driven by a history of discriminatory practices from outside "support" that have regularly disenfranchised communities of color [10]. Therefore, choosing to only use services housed by trusted local organizations (i.e. the community partner) and who

take time to engage in person in the community is a strength of business owners in efforts of self-preservation. Ultimately, we believe taking a more collective perspective can help fulfill the call for "more inclusive local technology ecosystems" for driving minority entrepreneurship in underserved areas [39].

5.2 Culturally-Conscious Ecosystems of Technology Support

We find that business owners are aware of the utility of digital tools, but are hesitant to invest the time and money needed to get started. Business owners are pushed to adopt technology by multiple stakeholders—business support organizations, friends and family, and technology platforms. Our survey results show businesses are interested in adopting various digital technologies, including websites, social media platforms, point-of-sale systems, and accounting software. Many of them have attempted to use these tools on their own, turning to search engines and online tutorials for guidance. Despite being interested in using technology, existing support services, like educational workshops and one-off consulting services, were not enough to bridge the digital gap for many of our participants. Both representatives of business support organizations and business owners themselves expressed that there needed to be more resources that work within the constraints of running a business, meaning trusted one-on-one guidance catered towards business owners' specific technology needs.

One of the key values of the CTW program was its assets and inherently care-based [57, 91] approach to building trust with business owners. Care-based approaches are particularly effective in supporting technology usage in underserved minority contexts [27, 92]. Similar to prior HCI work informed by ethics of care [57, 66, 87], we see care-based approaches to community engagement as ongoing interactions that promote individual and collective wellbeing [91]. This might mean providing mutual support within a community [28, 88, 89], being sensitive to diverse backgrounds and experiences [69, 70], and being flexible and adaptable [16]. In our study, business owners shared how CTWs carefully listened to their technology challenges and patiently walked them through using new digital tools. Business owners expressed that this care-based approach helped them become comfortable using and troubleshooting technology, which ultimately made a significant difference in their eagerness to try new tools moving forward. Furthermore, the fact that some of the CTWs were local neighborhood residents helped establish further comfort between business owners and CTWs. Through observations, we noted how CTWs from the neighborhood could mention their own experiences with some businesses (e.g., a favorite item on a restaurant's menu), which smoothed relationship development.

Our work also highlights the importance of considering businesses' context-specific ways of working. For instance, our survey results point to business owners' high reliance on mobile phones for conducting their work. These findings highlight similar entrepreneurial activity in developing contexts [29] where mobile phones are the primary way to stay digitally connected [19, 43, 61]. Researchers studying digital access find that relying on phones for everyday needs may be even more challenging in "developed" countries like the U.S., where access to high-tech tools, like laptops and digital platforms, is expected and often required [42]. For instance, Gonzales points out that chronic "underconnectedness" in the U.S. [78, 81, 105] can be even more problematic in places "where representative data gives the appearance of widespread ownership and use" [17, 42].

In many cases, demonstrating caution and weighing the costs of adopting technology is an asset for self-preservation. For many underserved businesses who attempted to adopt technology beyond their financial means, this led to outdated websites and online profiles with the wrong address, contact information, and hours. Some business owners, like Paul, paid the financial costs of using technology when offline solutions, like a paper-based menu, would have been simpler to maintain. Given their exceptionally busy schedules, business owners were overwhelmed with having to deal

with maintaining technologies, and some regretted trying to use them in the first place. This leads us to question, Is it responsible to insist on widespread technology use in contexts with minimal support and resources for adoption and maintenance? What support for digital engagement should digital platforms, and local organizations, commit to providing when pushing technology adoption in an underserved region?

Lack of support infrastructure for digital engagement often makes the costs of technology adoption greater than the benefits [42, 74]. For these reasons, business owners found the CTW program particularly useful given its affordability (free) and ability to work within the business owners' schedule. For instance, rather than taking a multi-day workshop on a broad topic (e.g., Creating a Website), CTWs directed their attention to helping business owners troubleshoot their specific questions (e.g., updating hours on the website). Rather than having to set up appointments with a business service consultant every time problems arose, CTWs were available to answer quick questions via text and phone call as needed. And, rather than having to pay extra for missing or rescheduling business service appointments, CTWs were patient and flexible in providing support based on the business owners' time availability. While this type of flexible service might seem less efficient, we found that underserved minority business owners were keen to use CTWs because it worked for their goals and within their constraints via trusted relationships, which ultimately provided more opportunities to build confidence in using digital tools long-term.

6 CONCLUSION, LIMITATIONS, AND FUTURE WORK

Our study describes a pilot community-based intervention to support underserved business owners on Detroit's Eastside. Digital engagement is becoming more critical to small businesses' success. But, the greater emphasis on technology use introduces questions of *who* is able to fully and easily benefit. We find that underserved minority business owners on Detroit's Eastside are eager to use technologies but are hesitant to make the leap due to time and resource constraints. We contribute a community-based intervention—Community Tech Workers (CTWs)— to supporting digital engagement that 1) helps business owners figure out how to start using technology, 2) offers support grounded in the day-to-day realities of running a business, and 3) is built on relationships of trust and care. In particular, we find that just a few sessions with CTWs motivated business owners to expand their technology use, sometimes on their own. Finally, we discuss how our collective perspective on assets-based development can strengthen the assets of business owners while building the capacities of tech workers themselves—together contributing to a more culturally-conscious ecosystem of support.

While we believe much of the findings are generalizable to underserved minority business owners in urban areas of the U.S., we call for similar work to be performed in related contexts, like other neighborhoods in Detroit or other U.S. cities. We are currently piloting the CTW program in two other neighborhoods in Southeast Michigan to determine if we see similar or different outcomes. Second, we acknowledge that there is much more to be evaluated to gain a more comprehensive understanding of the efficacy of this program. For instance, we plan to analyze the CTW training and the tech workers' experiences working with business owners. We also must reflect on the university's relationship with the community partner in implementing the project. Each of these stakeholders provides a critical perspective yet to be evaluated.

Finally, further work could be done to determine the sustainability of the CTW intervention. We initially took an assets-based approach, given its opportunity for sustainability. Our findings highlight that just a few one-on-one sessions from trusted tech workers could jumpstart small businesses in technology use and adoption. Conversely, some seemingly simple support tasks could take multiple sessions due to business owners' hectic schedules. Ultimately, the cost to sustain a free service is a burden on the community partner to find grants and sponsors. So far, the community

partner has secured additional funding to extend the program at least for another year and a half. Other local business service organizations are also interested in expanding the project and have offered funding as well. By continuing this research, we hope to demonstrate the value of this intervention and identify how this model can succeed in the long term.

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