Building a Client Resource and Communication Platform for Community-Based Organizations: Co-Design to Address Health and Social Needs

Courtney Lyles, Beth Berrean, Ana Buenaventura, Svetlana Milter, Dayana Daniel Hernandez, Urmimala Sarkar, Christian Gutierrez, Nynikka Palmer, William Brown

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Abstract

Background: Connecting individuals to existing community resources is critical to addressing social needs and improving population health. While there is much ongoing informatics work embedding social needs screening and referrals into healthcare systems and their electronic health records (EHRs), there has been less focus on the digital ecosystem and needs of community-based organizations providing or connecting individuals to these resources.

Objective: We used human-centered design to develop a digital platform for community-based organizations, focused on identification of health and social resources and communication with their clients.

Methods: Centered in the Develop phase of the design process, we conducted in-depth interviews in two phases with community-based organizational leadership and staff to create and iterate on the platform. We mapped participant feedback to theory-informed domains from the Technology Acceptance Model, such as Usefulness and Ease of Use, to build the final product, and summarized all major design decisions as the platform development proceeded.

Results: Overall, we completed 22 interviews with 18 community-based organizational leadership and staff in two consecutive Develop phases. After coding of the interview transcripts, there were 4 major themes related to usability, relevance, and external factors impacting use. Specifically, CBOs expressed an interest in a customer relationship management software to manage their client interactions and communications, and they needed specific additional features to address the scope of their everyday work. In addition, community-based organizations prioritized digital and text messaging communication with clients and needed easier ways to identify relevant community resources based on diverse client needs and various program eligibility criteria. Finally, clear implementation needs emerged, such as digital training and support for staff using new platforms. The ultimate platform, entitled Mapping to Enhance the Vitality of Engaged Neighborhoods (MAVEN), outlined feature changes and additions in line with these qualitative findings, including core implementation strategies for improving rollout and use.

Conclusions: Community organizations hold deep expertise in serving local communities and neighborhoods with resources that promote health and wellbeing. Human-centered design was well-matched for the creation of a digital platform that supports community-based organizations in connecting clients to relevant health and social resources. However, much more work will be necessary to support the implementation of platforms specific to community-based organizations' needs, especially given the training and customization needed in these settings.

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Introduction

Connecting individuals to existing community resources is critical to addressing social needs and improving population health. While there is much ongoing informatics work embedding social needs screening and referrals into healthcare systems and their electronic health records (EHRs), there has been less focus on the digital ecosystem and needs of community-based organizations providing or connecting individuals to these resources.

Objective

We used human-centered design to develop a digital platform for community-based organizations (CBOs), focused on identification of health and social resources and communication with their clients.

Methods

Centered in the Develop phase of the design process, we conducted in-depth interviews in two phases with community-based organizational leadership and staff to create and iterate on the platform. We elicited and mapped participant feedback to theory-informed domains from the Technology Acceptance Model, such as Usefulness and Ease of Use, to build the final product, and summarized all major design decisions as the platform development proceeded.

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Overall, we completed 22 interviews with 18 community-based organizational leadership and staff in two consecutive Develop phases. After coding of the interview transcripts, there were 4 major themes related to usability, relevance, and external factors impacting use. Specifically, CBOs expressed an interest in a customer relationship management software to manage their client interactions and communications, and they needed specific additional features to address the scope of their everyday work, namely: 1) digital and text messaging communication with clients and 2) easy ways to identify relevant community resources based on diverse client needs and various program eligibility criteria. Finally, clear implementation needs emerged, such as digital training and support for staff using new platforms. The final platform, entitled Mapping to Enhance the Vitality of Engaged Neighborhoods (MAVEN), was completed in the Salesforce environment in 2022, and it included features and functions directly mapped to design process.

Conclusion

Engaging community organizations in user-centered design of a health and social resource platform was essential to tapping into their deep expertise in serving local communities and neighborhoods. Design methods informed by behavioral theory can be similarly employed in other informatics research. Moving forward, much more work will be necessary to support the implementation of platforms specific to community-based organizations' needs, especially given the resources, training, and customization needed in these settings.

Introduction

Research supports expanding screening and referral for social needs within healthcare systems [1]. Approximately 20% of health outcomes are associated with medical care, while the remaining influences are social, community, and structural factors – sometimes referred to as social needs and the broader social determinants of health [2]. Health systems need to work collaboratively with community-based organizations (CBOs) to address unmet social needs that affect health and healthcare outcomes [3].

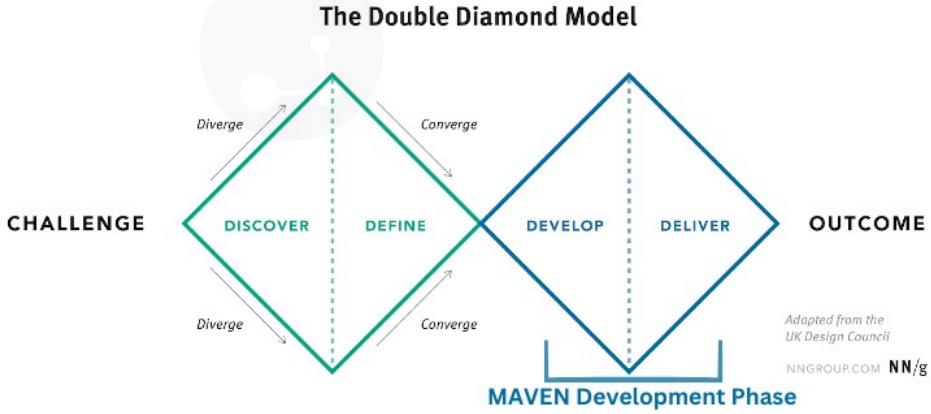
Much of the research to date has focused on healthcare system electronic health record (EHR)-based

platforms that can send and receive information from community organizations about social needs resource referrals, such as new EHR screening tools to assess social needs domains like food or housing insecurity as well as EHR-integrated platforms that can recommend and/or connect patients to relevant programs in the community. There is emerging evidence that these EHR-based platforms can improve screening and referrals, but downstream impacts on healthcare and health outcomes are less clear [4]. However, there is a need for better digital platforms explicitly *within* CBOs that identify or connect clients to social and community resources to promote health. Even though CBOs communicate with community members about health and social needs and connect clients with other community resources, they have much different workflows than clinicians and staff in healthcare settings and they do not have access to existing EHR platforms. Digital design focused outside of the healthcare system is essential to contributing to a future broader ecosystem of referrals and connections between community organizations, social services agencies, public health agencies, and healthcare settings [5].

We employed human-centered design methods to build a platform to support CBOs in understanding client social resource needs and connecting them with the most relevant resources in neighborhoods within San Francisco. We outline here our design methods and the concrete platform build decisions that emerged from our work with community organizations, as both the methodological approaches and the design features from this work are relevant for other organizations and projects focused on social and health needs.

Methods

As a part of a 4-year NIH project entitled Mapping to Enhance the Vitality of Engaged Neighborhoods (MAVEN), we built and then pilot tested a digital platform for CBOs serving communities within the San Francisco Bay Area (SF Bay Area). While this project focused on specific health and social resource referrals in San Francisco, the design methods as well as the final platform characteristics are relevant for many other communities working on the same questions and processes for CBOs. This work was informed by the Double Diamond design framework throughout all phases of the study [6]. We have previously published the Discovery and Define phases of this project, in which we conducted extensive qualitative work with community members and community leaders to identify the core audience and design principles for this work. In brief, in the Discovery phase, we highlighted CBOs as the pivotal audience for digital platform development (given their central role in resource provision and trusted roles within their communities [7]. Then, the Define phase highlighted the need to build a broad and scalable digital platform to support resource needs in multiple domains and for diverse sets of clients/populations served [8]. In the next Develop phase of work outlined here, we focused on the final build of the MAVEN digital platform.



While not all design studies are theoretically oriented, we combined the rigorous design methods with a well-established theory to additionally bolster the rigor of the work and further enhance the generalizability of the study. In particular, we used the Technology Acceptance Model to frame our

interview guides and analysis [9]. This theory summarizes core concepts of technology acceptance and use into major domains, such as Ease of Use and Usefulness, which have been validated in many previous studies assessing how and why technologies are adopted [9]. Thus, the addition of theory to our design work allowed us to ensure that participant feedback was consistently documented and categorized against validated constructs throughout the study.

Building the MAVEN platform: the Develop Phase

In the Develop phase, we completed two iterative rounds of design with CBOs in the SF Bay Area. First, we completed 8 interviews with CBOs in late 2020 and early 2021 to understand their existing workflows using digital/online platforms to track and communicate with their clientele. At the end of these open-ended discussions, we also asked community leader participants to look at example digital resources to explore the features and relevance of these type of platforms in their everyday work. For example, community leaders reviewed websites with resources (such as on SF Department of Children, Youth and their Families), providing overall opinions about usability as well as the types of information and content they might want to see displayed [10]. This phase was primarily open-ended and hypothetical, given that the platforms shown to participants were not always relevant for their own work. The interviews were conducted and recorded via Zoom, with the audio then converted into text via professional transcription.

After this round of feedback was completed, we created a minimal viable product (MVP) of the MAVEN social resource tool for CBOs and conducted additional co-design interviews. An MVP is a standard step in the design processes in which the team creates the simplest working prototype that can be tested, which is critical before more intensive digital building [11]. The MVP was created in spring 2021, and we completed an additional 13 thinkaloud interviews with CBO leaders to test the MVP in May and June 2021 [12]. These video interviews were conducted and recorded via Zoom, and the audio was then professionally transcribed. The thinkaloud process asked each participant to navigate the MVP on their own sequentially through each task or feature in the platform (e.g., logging in, adding clients, sending a communication to a client), with prompts at every task that elicited technical errors or roadblocks as well as participants' overall opinions and reactions to the MVP.

Data Analysis

We used qualitative descriptive methods to complete our analyses within the Develop phase of the work, combining the participant feedback across all iterations of the platform build [13]. The text of transcribed interviews were analyzed using Dedoose qualitative analysis software, and the second-round interview transcripts were also compared side-by-side with videos of the MVP thinkaloud procedures. Using open coding, we first identified overall patterns of feedback from participants, holding regular team meetings to establish consensus on the major usability and content feedback categories that emerged (i.e., specific feature needs and preferences, technical barriers to use). Next, we mapped these categories onto Technology Acceptance Model domains to examine how the overall discussion categories were related to documented theoretical constructs such as relevance/usefulness as well as ease of use of the platform.

Finally, we made overall design decisions informed by these qualitative findings to incorporate into the final MAVEN platform. More specifically, we used the data from both rounds of feedback to prioritize new functionality that needed to be added to the platform, as well as improvements or changes in the MVP features that would improve relevance or usability. These design changes are summarized in depth below, with the final MAVEN tool completed in the spring of 2022.

Results

We completed 22 in-depth interviews (9 in the first phase and 13 in the second phase of the study), with 18 unique CBO leaders and staff in total (4 participants were interviewed in both phases of work). The 18 participants in the Develop phase of the MAVEN project work ranged from individual consultants working on multiple health campaigns in their local neighborhoods to mid-

sized non-profit organizations running programs and provisioning services in their communities. The full summary of participants is shown in Table 1.

Table 1

Summary of Community-Based Organizations Staff/Leader Participants

Phase	Organization Type	Participant Title/Role	Location
1	Non-Profit	Director of Community Partnerships and Program Evaluation for HIV Programs	San Francisco, CA
1	Non-Profit	Agent and Disability Resource Specialist	Mission neighborhood, San Francisco, CA
1	Non-Profit	Information and Assistance Specialist	Mission neighborhood, San Francisco, CA
1	Non-Profit	Program Director, Women's cancer program	Tenderloin neighborhood, San Francisco, CA
1	Non-Profit	Program Coordinator, HIV/AIDS programs	San Francisco, CA
1,2	Community advocate	Health Educator and Activist	San Francisco-Bay Area, CA Los Angeles, CA
1,2	Non-Profit	Senior Services Manager	Mission neighborhood, San Francisco, CA
1,2	Local planning council; Non-Profit	Member; Senior Director of Programs	Tenderloin neighborhood, San Francisco, CA
1,2	Non-Profit	Executive Director	San Francisco, CA
2	Local government housing/community organization	Director, Social/health resources	Tenderloin neighborhood, San Francisco, CA
2	Regional advisory group; Local government organization	Advisory Member; HIV Case Manager	Alaska, Hawaii, California
2	Non-Profit	Program director, Senior services programming	San Francisco, CA
2	Local government housing/community organization	Program Director, Digital programming	Tenderloin Neighborhood, San Francisco, CA
2	Community advocate	Community health/HIV activist	San Francisco, CA
2	Local government Public health department	Community health outreach/HIV activist	Alameda, CA
2	Federally Qualified Health Center	Health Educator	Marin City, CA
2	Non-Profit	Wellness Manager	Bay View

			neighborhood, San Francisco, CA
2	Public Research University System	Health Equity Strategist/Consultant	San Francisco, CA

Qualitative Results

Analyzing all in-depth interviews during the Develop phase, we identified four major themes from community leader participants, which are mapped to the Technology Acceptance Model domains of Usefulness, Ease of Use, and External Factors influencing use.

Overall Usefulness

In the domain of usefulness, there was consensus that access to technology platforms with the ability to track clients across programs and communicate with clients more seamlessly was a priority for CBOs. Several of the organizations' current workflows involved using out-of-the-box and/or free programs for their daily work of tracking clients, finding and referring people to resources, and communicating with clients. While existing platforms allow digital communication with clients and tracking client contact information or program participation, the standard work was often non-integrated and potentially duplicative. For example, one participant stated, "If you want to refer somebody or some participant to other services, … you can Google it and just find out the exact address and telephone that they can call. I think it's the best tool that we can have now to just give more information and referrals." It was clear from these participants that better functionality beyond free platforms would improve their daily work at CBOs, such as by standardizing the search and communication workflows into a single place.

More specifically, there was an understanding among community leaders that existing consumer/customer resource management (CRM) platforms, such as Salesforce and other similar CRM software, were important to be able to complete multiple client functions together – such as tracking clients and communicating with clients (individually or in groups) without toggling between multiple different platforms. For example, one participant stated, "I love [seeing]...a lot of information and a lot of resources at the same time. So, I don't have to look for another screen and start looking for another information for the clients." Thus, any CRM platform that combined database management for clients alongside communication tools was mentioned as more ideal for CBO workflows. Specific to the selection of a CRM software, participants most often mentioned Salesforce as the platform of interest (either currently in use or a wish for use in the near future): "I think at least 50% [of organizations we partner with] are using some portion of Salesforce [with] their clients."

Relatedly, the usefulness of up-to-date lists of community-based resources was a top priority for almost all participants. For example, one community leader stated that, "I think that [technology] would be a good way to maybe have a resource list of frequently used CBOs [and resources they provide]." And similarly another participant stated, "I think being able to see what [resource] is available – and I think if this stuff is updated in real time, it's super helpful…Having specific contacts [at each organization] for different opportunities[/resources] is really key just because I think that's often something that people spend a lot of time trying to determine." However, it was clear that this registry of community resources would require upkeep and trust in the resources presented. For example, participant mentioned, "[A registry of] existing community resources -- that's a lot to keep up-to-date. And if you just don't have it, then you're not disappointing people [clients]."

A final useful function of a platform for CBOs centered around communication with clients. Comments such as these solidified the need to have integrated and customizable communication with

clients as a core function of the platform: "You…have subgroups of different clients depending on what the [program] is, and then you would just create a new [communication] for whatever thing you were doing," and "I feel like, just knowing colleagues at other places, a lot of people are paying money for text and email blasts."

Overall Ease of Use

Next, there were a number of usability issues that emerged during the interviews.

In addition, when interacting with the early MVP of the MAVEN platform, there were several usability comments made about the layout and the terminology, especially in the context of community-oriented work. One participant stated it as: "I just want to make sure that [you know that] some of these words that you're using are a little technical…. Maybe finding other words…that will describe something that's more simple and easier to find." And another participant mentioned: "Since it's our first time, it's going to be difficult just to find everything, but once you get to know it, I think just it's going to take less than a week just to see and working with the database or with the website."

While the overall usability ratings of the MVP were favorable, there were several areas of improvements that community leaders mentioned that were specific to increasing the usability of a platform that served diverse clients and were necessary in many CBOs' workflows. First, participants identified a need to have easier ways to find recommended resources for clients, as exemplified in comments such as, "[Make it] easy to find if it's in alphabetical order or has some kind of a search engine that I could put in 'Help with income taxes' or 'Grocery shopping' or whatever the [client] needs." Similarly, another participant stated that it is important to ensure that referrals to resources match their participants' eligibility and identity: "[To make sure] you could search by eligibility requirement, whether it's senior citizen, or HIV-positive, or somebody who identifies as LGBTQ."

Next, participants identified clear equity-focused improvements to the platform, especially around language accessibility and sociodemographic representation of fields (particularly careful collection of sexual orientation and gender identity data for LGBTQ+ populations). For example, one participant stated, "When I talk about cultural sensitivity, like I said, it's not just a language also. If it's from LGBTQIA community or different cultures, it's very, very important. Age also is another issue," and another stated, "I know that many agencies have different [languages], for example, Chinese and English, also, Russian and English, Spanish and English…So, it should be in multiple languages."

External factor: Varying implementation contexts within CBOs

Finally, there were many external factors that emerged as critical to use of the MAVEN platform. These comments generally focused on the implementation context for using such a digital platform.

First, there was a clear need to focus on digital skills and necessary training among CBO staff. For example, participants stated, "We know Salesforce has really high potential, but we don't have the time to learn it all…So, we don't use this fancy thing because it was just too overwhelming to use, to learn it and so we're just comfortable with what we know," and "I feel like there's certainly a spectrum of computer literacy across my team, and so I think getting folks that are less technologically adept onboard for using something like this could be a little bit challenging, but I don't think it would be that hard."

Participants also discussed that no platform would be successful without leadership support as well as very detailed training among frontline staff. For example, participants stated, "I feel like it's important to have a collective buy-in or an agreement or some kind of commitment to using a certain resource to sort of get it off the ground," and "Oftentimes, there are lots of tools that you will get sent

that will be given to somebody but I think they're only as good as the people that are using them." Furthermore, there were common comments about on-the-ground support for staff members at CBOs such as, "I was thinking more training for community leaders in how to really effectively use this tool."

In addition, there were more nuanced conversations with CBOs about their current workflows with clients that needed to be considered in order to get uptake of a new system. In particular, because CBO staff used in-person and phone outreach often for clients, any digital tool would require consideration of how to blend such high-touch, face-to-face communication with the lower-touch messaging and reminders that digital platforms can facilitate. Quotes like these exemplified this idea: "So it's about having a conversation with the client and understanding how they best connect the services and also what barriers may be in the past they have faced when trying to connect with other providers and sort of strategizing ways to circumvent those challenges." Comments from CBOs about their workflows highlighted that even a perfect digital solution which easily facilitated messaging may supplement but not replace high-touch conversations with clients about their preferences for resources.

Finally, some of the conversation about implementation centered around two additional points that related to the overall uptake and dissemination of any platform. The security and privacy of information in any client database was critical, especially given the sensitive information disclosed by clients and the known predatory behavior of hackers and other criminal behavior. This was exemplified in the following quote: "Organizations may take advantage of … elderly patients." Moreover, the implementation considerations for wider spread and uptake of digital platforms for health and social needs also centered on the practical work of maintenance, which cannot be overlooked. For example, one participant stated: "There is a lot of movement that occurs in public service organizations that having the most up to date data or contacts could be a concern and a lot of work on us to continue to update." In other words, the ability to use existing resource lists that are actively updated and monitored for relevance is essential for implementation, and will not be solved by a technical solution alone.

Final Design Decisions and Build

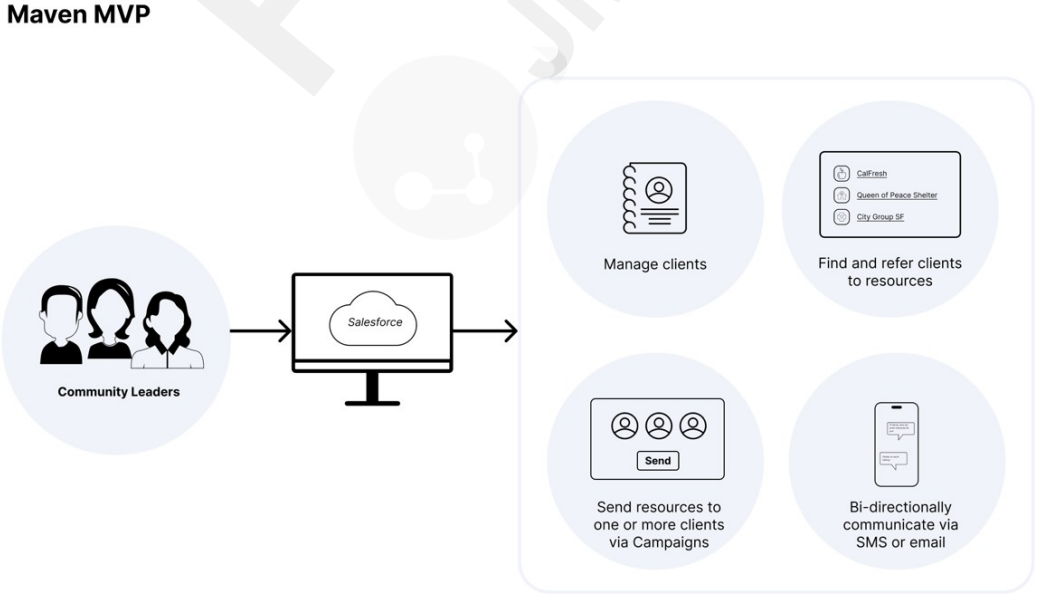
Given the qualitative findings across both the open-ended and the MVP testing of the MAVEN platform, we made multiple design decisions that reflected the community-based organizational leadership input and preferences. Overall, we chose to design within Salesforce, activate several features within the platform, and then integrate outside tools to provide information and tools within the platform. Table 2 summarized core findings matched to concrete features/changes within the MAVEN platform.

Table 2. Major design needs from co-design feedback	**Feature/Change implemented in Develop phase**
Platform need: Community leaders used or wanted CRM platform to manage their clients/workflows	Selection of Salesforce platform for MAVEN build
Feature need: Community leaders had knowledge of social/health resources, but strongly desired a trusted and easy to use directory to improve client resource referrals	Review of several options for an up-to-date list of community resources; Selection of San Francisco Service Guide existing resource list (imported into MAVEN via application programming interface or API)
Feature need: Simple and seamless communication as a priority to reach and stay connected to clients	Activation of Twilio within Salesforce Campaigns to allow for two-way texting functionality

Feature need: Matching of available resources to specific client needs and identities was critical	Selection of ServiceMatch feature from Salesforce, which uses an algorithm to algorithm to recommend “best” resource by resource type/category (e.g., food), zip code, and eligibility criteria (e.g., language of service provision)
Usability improvement: Improvement of language and data collection fields within digital platforms to better represent client identities	While using existing CRM platform, we expanded client intake fields to be better representative of the community; Exploration of designing in multiple languages (but unable to do so in this Develop period)
Implementation consideration: Workflows and staffing capacity within CBOs varied greatly and needed to be prioritized	Implementation support and training identified as a high priority during rollout

We ended up implementing these design decisions in stages within our work. In the first MVP build of the MAVEN platform, we identified the core platform and communication functionality needed:

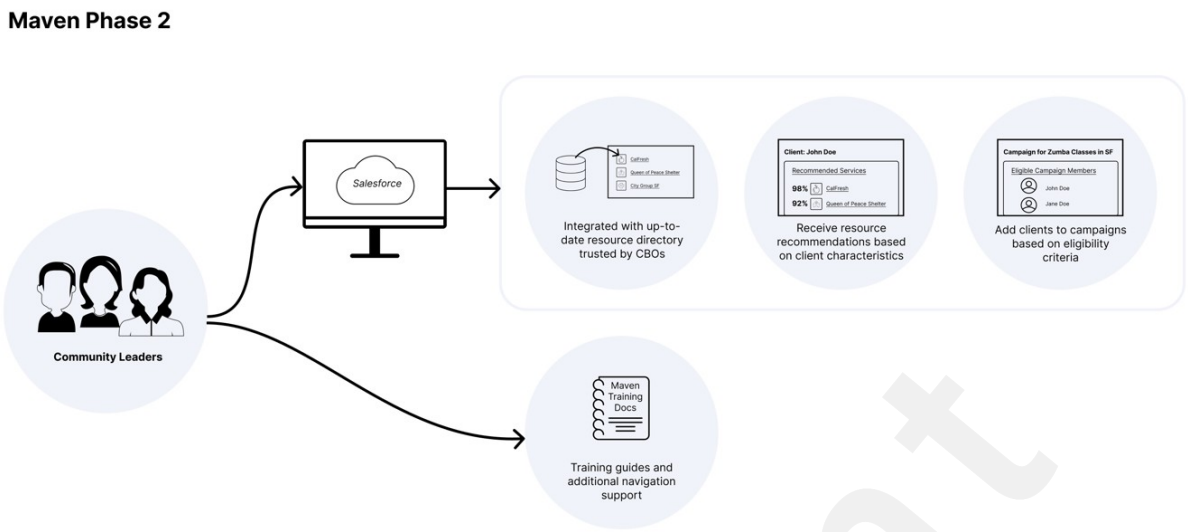
1. Salesforce environment, as this was a platform used in about half of existing community organizations to track client and program information (only accessible/viewable within their own organization). This selection was regularly expressed as a desired platform by most CBOs in the study.
2. Enabling the Campaign feature within the Salesforce environment, which allows group SMS and email communication within the platform (on top of existing client tracking features). Thus, community leaders could login, create new contacts or clients, and also create new messages with any content they developed or inserted.
3. Adding Twilio-for-Salesforce managed package to seamlessly allow two-way text messaging via the platform.



After the second phase of testing an MVP of the MAVEN platform, we identified additional platform features as new final components of the tool:

1. Integration with an existing resource directory that was trusted among community organizations. After review of several existing lists of community resources in San Francisco, we chose a freely available and regularly updated resource list called the San Francisco Service Guide (managed by a non-profit called ShelterTech) [14]. This registry of resources included categories of resources; locations, hours, contact information for each resource and some free text eligibility information for the resource (e.g., available to those aged 65 or older via a senior center) [14]. We connected SF Service Guide via application programming interface (API) into Salesforce and built an automated refresh process to update the list of records on a weekly basis. The underlying SF Service Guide repository was regularly updated every 90 days by volunteers at ShelterTech.
2. Ability to receive "recommendations" for a client resource based on category of resource, location, and/or eligibility criteria. We chose a freely available and open-source tool within the Salesforce environment called ServiceMatch to recommend specific resources to CBOs ServiceMatch was designed and made available via the nonprofit arm of Salesforce called SalesForce ImpactLabs [15]. We customized the existing code for ServiceMatch within MAVEN, adjusting the algorithm to be able to use the existing resource list information to make recommendations of the most relevant resources based on client characteristics (e.g., eligibility of resource based on age, location (i.e., client zipcode), and resource type (i.e., search for food vs. housing)). Finally, connecting ServiceMatch with Twilio allows community leaders to refer these relevant resources to clients via SMS in addition to email and printout with one click.
3. Extension of existing Campaigns Salesforce tool that automatically adds clients to the campaign based on the resource eligibility criteria and allows referral of multiple resources to one or more clients. Thus, the community leaders can create a campaign and add multiple resources to the campaign, and the system automatically selects clients based on the unified eligibility criteria across all campaign resources selected. Broadcast messaging service was used to send bulk SMS messages to clients included in the campaign.
4. Addition of implementation support. Finally, we created detailed user guides and training materials to support CBOs in using a platform that was often very new to their daily workflow and addressed some of the major navigation questions that were confusing in the platform.

The final MAVEN product combined elements from multiple places that did not previously exist: the Campaigns feature (with additional communication functionality), plus curated resources directly from SF Resource Guide, plus searching of resources by type, location, and eligibility via ServiceMatch.



Discussion

This paper outlines a co-design process to create and iterate a digital platform for CBOs, focused on finding relevant health and social resources and easily connecting clients to these resources. Overall, human-centered design methods elucidated core needs and preferences of CBOs for health and social resource screening and referrals. This is an audience that has often been overlooked in the clinical informatics literature given that CBOs work outside of the EHR and have entirely different workflows with their clients as compared to a healthcare environment [16, 17]. Specifically, we outlined multiple platform features and design decisions that matched the needs expressed during in-depth qualitative interviews, applying a rigorous and theory-informed approach to the design.

Our findings are likely to have relevance outside of the San Francisco context because of the design choices made in this study. First, many CBOs across the country are looking to use CRM software and specifically Salesforce to manage client communication, which was also reflected in our study findings. Therefore, there is the ability for other groups to utilize the existing Salesforce functionality identified in the MAVEN study (such as ServiceMatch and the Campaigns feature with Twilio integration). In addition, we chose to integrate an existing resource list via application programming interface (API) into the MAVEN platform, which can be swapped out for any other resource list based on the local context in other communities. Importantly, the co-design process in this study to build the MAVEN platform led not only to the enhancement of the tool but also specific attention and focus on the context for using the tool, such as use of existing operating platforms, workflow considerations, staffing and workforce capacity, and the flexibility of the tool to meet the diverse needs of clients served [18,19].

Moreover, this study is a useful example of the Develop phase of the design work, which emphasizes real-world implementation and potential constraints, which are a critical complement to the open brainstorming and ideation of the Discovery phase of design [20]. Moving forward in this field, it will also be critical for future studies to focus on human-centered design to advance health equity. Equity-focused design methods are spreading, and these methods are essential for building platforms that prioritize the needs of marginalized communities and address multiple levels of influences on health outcomes [21,22].

Limitation

This study had several limitations, such as the completion of the work in a single geographic area (the San Francisco Bay Area) and the relatively small number of organizations participating in the design. However, both the design methods and the findings that highlight implementation considerations are widely generalizable to many other cities and municipalities (in addition to the Salesforce build considerations mentioned above). Finally, the budget of this research project also

limited the number of phases of iterations and the final set of features activated. Similarly because of budget, we were not able to transition use of the MAVEN platform from the UCSF Salesforce license (where the study testing occurred) to independent licenses at CBOs, which remains a barrier for longer term uptake.

Conclusion

Moving forward, there is a strong need for more community-engaged research and informatics co-design to support the development and implementation of platforms that assist CBOs in their daily work. Understanding individual social needs within healthcare delivery systems is essential for health promotion, but solutions that require delivering health and social resources within local neighborhoods will not be solved by healthcare systems alone. In order to partner with CBOs and follow their expertise, we also cannot ignore the resources, capacity, and skills/training needs in these organizations (as our study and many others have highlighted) – as real impact will be diminished without investment in CBOs based on their priorities.

APPENDIX A

Semi-Structured Interview Questions for Community-Based Organization Leaders

Could you start off telling us a little bit about you and the role your organization plays?

Tell us a little bit about the technology you use in your day-to-day work with community members...

1. What are you mandated to use? Which would you continue to use if you weren't required to do so?
2. What kinds of screening or additional data do you track about your community members?
3. What tracking systems do you have that you use for internal reporting or program development?
4. What do you like most about the tech tools you have right now?
5. What are your biggest challenges using technology in your everyday work, especially when working with clients?
    a. PROBE: communicating with clients both inside the office and "on the go"
6. Who in your organization owns decisions about which technology system you use? Do they also own the implementation of this solution?
7. How often do clients come in? How do you typically communicate with your clients?

Access/Install Salesforce Website/App

Share Salesforce tool link and username and password with participant. Complete log-in and then have community leader share screen.

Specific Usability Tasks

1. Look at the Contacts feature and then practice adding a new participant to the contacts list

2. Review the different resources available
    a. Pick one resource, or add a resource you typically refer your clients to
        i. Click on New
    b. Try and send this resource to the following client: [[Pick a client]]
        i. Would you prefer to email or SMS? Complete communication as preferred
3. Campaigns
    a. Try sending an email campaign with this resource
    b. Send a bulk SMS to a group of clients with another resource linked

Follow-Up Semi-Structured Questions

1. What are your initial thoughts after downloading/reviewing how to use this tool?
    a. What was challenging about this process?
    b. What do you think worked well?
    c. What would you change?
2. What kind of scenarios do you anticipate using this tool?

3. Any concerns you already have about the tool?
4. What types of resources are you typically referring clients to?
5. How do you anticipate using the tool with your clients?
6. What are you interested in testing or using more?
7. Anything else that you think we should know before we continue further developing a tool like this?

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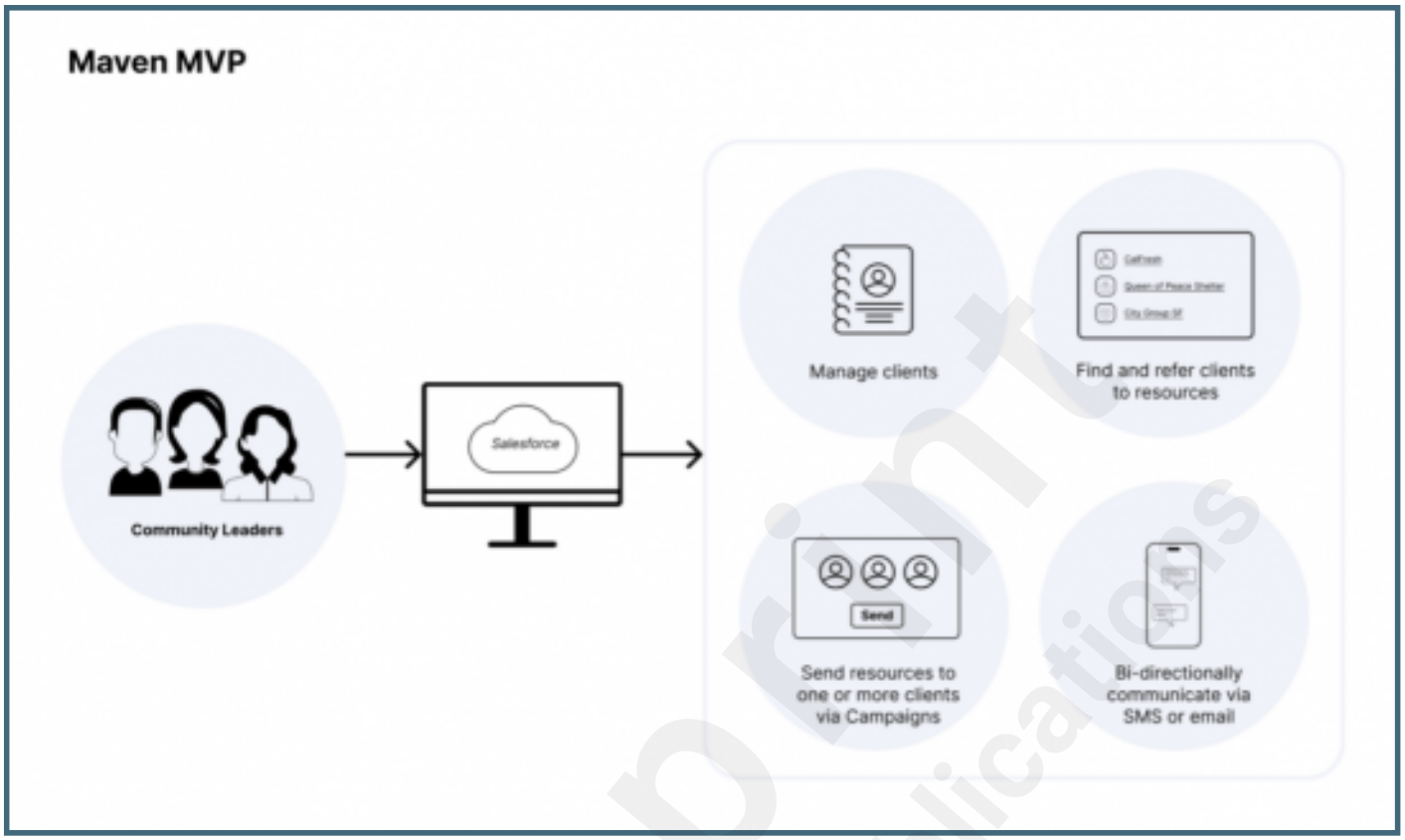
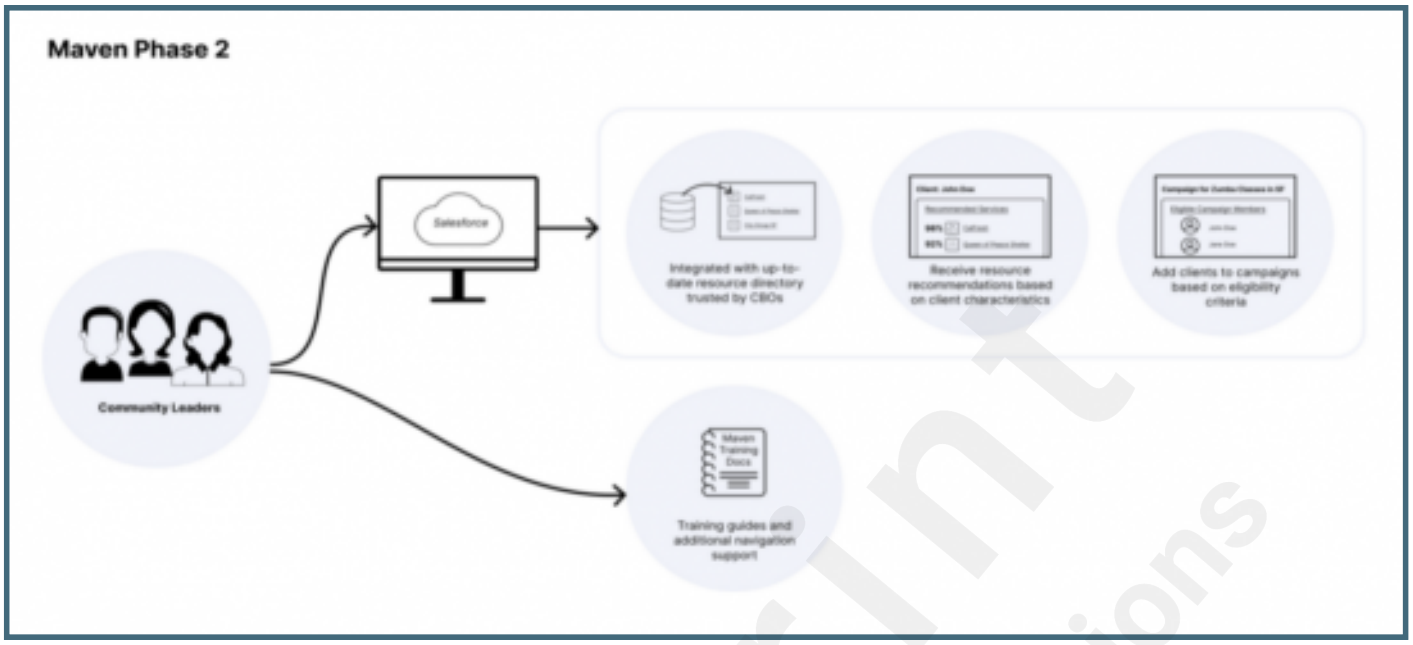
Supplementary Files

Figures

Maven mvp.



Maven Phase 2.



Multimedia Appendixes

Semi-Structured Interview Questions for Community-Based Organizational Leaders.
URL: http://asset.jmir.pub/assets/f47cd59b3025d6a0a18210e793e76687.docx