DACC Intensive Case Management Program Evaluation

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Executive Summary

Background

The City of Austin established the Downtown Austin Community Court (DACC) in 1999 as a separate entity from the Municipal Court which would "improve the community's quality of life and public order through effective and creative sentencing of misdemeanor offenders." Over the past two decades DACC has expanded to serve clients on a walk-in basis or through referrals from the Coordinated Entry process, led by the Austin/Travis County Continuum of Care Lead Agency, Ending Community Homelessness Coalition (ECHO). DACC has also taken on additional cases resulting from the City of Austin's encampment ban and the COVID-19 pandemic. The City of Austin often calls upon DACC to assist during emergency situations.

DACC engaged our University of Texas at Austin research team to perform a program evaluation of the DACC Intensive Case Management (ICM) program for people experiencing homelessness. The goals of this program evaluation include assessing the ICM program's effectiveness, identifying areas for improvement, and providing recommendations based on key findings.

Key findings

Our team conducted literature reviews, comparative analysis, surveys, semi-structured interviews, and collaborative design interviews to develop the following key findings:

- Data collection and entry processes are inconsistent and lead to low data quality, resulting in missing demographic information, context, or important client next steps;
- DACC's current budgeting methods do not allow for a comprehensive evaluation of budgetary efficiency;
- DACC is engaging in pilot initiatives to improve data maximization. DACC is also actively working to develop a strategic plan;
- Current data organization and management requires case managers to manually sort through a dearth of client information. The current case note labels do not consistently align with case manager needs and experiences;
- Beyond a general vision of ending chronic homelessness, DACC's ICM does not currently have many tangible strategic goals or objectives to evaluate performance and areas of strength or improvement;
- DACC ICM job responsibilities, scope, and processes vary between case managers and job responsibilities do not seem specific and clear, and do not appear to have identified performance outcomes;

- DACC's ICM program does not currently incorporate consistent, time-limited, individual case plans;
- The ICM waitlist process and prioritization mechanism is unclear. Hence, the ICM waitlist process is opaque, and individuals often remain on the waitlist for long and undefined periods of time;
- DACC's ICM specialized case managers serve ICM clients as well as clients seeking triage or walk-in services. Some triage clients are also seeking to be placed on the ICM waitlist;
- ICM case managers are adept at navigating external services and contracts;
- ICM managers share a strong value of ending chronic homelessness;
- ICM clients express trust in their case managers, and they feel more confident about finding permanent housing; and
- Case managers often rely on their own individual relationships or contract knowledge to assist clients, indicating a lack of formalized, institutional knowledge regarding resources or processes for clients.

Key recommendations

Upon assessment of our team's key findings and research, the research team provides the following recommendations for DACC:

- DACC should develop measurable goals and objectives for both its ICM and triage programs. This work has already been started through an ongoing strategic planning process with an external consultant;
- DACC needs new budgeting methods to accurately allocate costs across DACC's programs;
- DACC would be best served by a separate data system tailored to its needs, that can support time-limited individualized case plans with the goal of transitioning clients to long-term care;
- DACC's waitlist process should be revised and prioritized;
- ICM data entry, collection, and training processes require evaluation and changes to improve data quality and efficiency;
- As DACC continues to grow, there is a need for further specialization of staff to efficiently manage client needs, e.g. separate triage staff to manage walk-in clients and allow for ICM case managers to focus on current ICM clients; and these roles should have new job descriptions and training;
- DACC should have specific protocols and performance evaluation metrics for staff; and
- DACC should review and update its case manager onboarding, training, and transition plans.

Introduction

Overview of DACC ICM

The Downtown Austin Community Court's (DACC) mission is to end homelessness by providing comprehensive, long-term services to individuals experiencing homelessness.[1] DACC uses a client-centered and housing-focused intensive case management model to help individuals experiencing homelessness achieve long-term stability. In-house case managers also currently provide supportive services to clients through walk-in triage.

Clients are referred to DACC ICM clients through three ways:
1. Community Court referrals: As a community court, DACC works to expedite court cases through alternative forms of adjudication. Individuals experiencing homelessness are often referred to ICM as part of their adjudication by the judge.
2. Coordinated assessment referrals: Individuals who complete the coordinated assessment, a centralized application for housing assistance, and who are deemed a priority by the assessment for intensive case management, are referred to DACC's ICM program.
3. Triage: According to DACC leadership, most of DACC's clients enter through its walk-in triage services, which do not require a coordinated assessment or court referral.

In addition to the community court and ICM programs, DACC provides additional support to the City of Austin in numerous ways:
- Housing Authority of the City of Austin (HACA): DACC assists residents who are living in HACA housing in the required annual HACA recertification process;
- Contract Support: Several DACC staff have contract management expertise and, through managing contracts for other agencies, save the City of Austin public dollars;
- Cold Weather Shelter: During winter storms and inclement weather, DACC supports city efforts to shelter people experiencing homelessness; and
- COVID-19: During the peak of the COVID-19 pandemic, DACC managed Pro-Lodges to help transition people into permanent housing and to reduce the spread of COVID-19 for people experiencing homelessness.

The goals of our research are to evaluate the design, implementation, and outcomes of the DACC's ICM program that serves people experiencing homelessness. The initial statement of work included the following questions:

1. ls the ICM program achieving the goals and objectives it is intended to accomplish?
2. Are the ICM program activities being produced with appropriate use of resources such as budget and staff time?

3. Does the value or benefit of achieving the ICM program goals and objectives exceed the cost of producing them?
4. Can progress on goals and objectives be shown to be related to the ICM program, as opposed to other things that are going on at the same time?

A lack of available data and budget information at DACC prevented our research and this evaluation from completely answering each of these questions. We discuss these research and evaluation limitations and ongoing efforts by DACC to address them in the research limitations and key findings sections of this report.

Methodology

Our team conducted extensive qualitative research exploring different aspects of DACC work, each with different goals related to this evaluation. In addition to surveying clients, we conducted three sets of interviews. The first focused on collaborative, data, and work practices. The second and third focused on design, specifically around data interfaces and how institutional knowledge informed case management work. Below is a brief outline of the various portions of our evaluation:

1. **Case Studies**: We explored other approaches to case management across the country, and summarized how these are relevant to the DACC approach.
2. **Client Surveys**: We conducted surveys with DACC clients to explore how clients think about both DACC and DACC case managers.
3. **ICM Semi-structured Interviews**: We conducted 39 interviews with DACC case managers and representatives from contracted service providers to understand how DACC collaborated across the Continuum of Care (CoC) and the daily work of case managers.
   a. **Zoom Meetings with Management:** Following initial data collection, we scheduled a series of informal meetings with DACC leadership, where we presented initial findings and discussed training, metrics, data practices, and staff responsibilities.
   b. **Team Analysis and Discussion**: Following initial data collection and concurrent with leadership meetings, we engaged in collaborative brainstorming and reflection with DACC team members to consider how our findings might best support the work of DACC.
4. **Case Note Data Analysis**: We conducted an exploration of the case note data collected by case managers to identify the gaps and potential impacts of data systems supporting ICM work.

5. **Design Interviews**: We conducted design interviews evaluating data and information infrastructure available to case managers and made recommendations for future system choices based on their outcomes. We explored how case notes might be better used systemwide by case managers and how these notes might be adjusted to collect data useful for outcome measures and evaluation purposes.
    a. *Case notes*: We conducted interviews focused on understanding and improving case note data use. We divided the interviews into two stages:
        i. Stage 1 was an interview focused on current case note practices along with the uses and challenges of potential client summaries.
        ii. Stage 2 consisted of a collaborative design activity aimed at generating a summary from case notes for a client.
    b. *Data labeling*: These interviews aimed to understand and improve the quality of checkbox data associated with case notes, and we divided them into two stages.
        i. Stage 1 explored current data labeling practices and the case managers' needs from the current system.
        ii. Stage 2 was a "speed-dating" study focused on getting feedback on 16 design ideas aimed at improving data quality.
6. **Shadowing and Observation:** We conducted approximately eight hours of onsite shadowing, observing ICM processes and intake practices.
7. **Management Analysis**: We conducted an initial budgetary analysis and an analysis of outcome measures. For each of these activities, we were limited in our analysis due to the unavailability of program specific budgets and data, and lack of comparable programs.
8. **Literature Review:** We conducted a literature review of research-supported best practices for intensive case management and critical time intervention models. We also researched examples of how other cities track and display outcomes related to homelessness services.

Case Studies

In December 2021, we selected five homeless courts across the United States that also have case management programs as case studies:
1. Columbia, SC Homeless Court Program;
2. Maricopa County, AZ Regional Homeless Court;
3. Alameda County, CA Homeless and Caring Court;
4. San Diego, CA Homeless Court Program; and
5. Santa Monica, CA Homeless Community Court.

We used a report on universal performance indicators for "problem solving courts" published by the Center for Court Innovation to develop an analytical framework for the comparative

analysis.[2] We selected five key indicators based on this report that closely aligned with DACC's capacity and analyzed the five other community courts based on these indicators. The indicators used included client service, compliance and security, accountability and trust, efficiency and cost, and governance.

Surveys & Survey Analysis

In April 2023, we conducted an onsite survey at DACC to assess how people with lived experience of homelessness find and use information. The survey consisted of two major sections. First, in the open text section, we asked questions on information needs, ways of retrieving information, and helpful services and accessibility to them. The second section asked respondents' perception and knowledge on DACC's services, on a scale of 1 to 5. We conducted an exploratory data analysis for both DACC's ICM participants and non-participants and compared results between DACC's ICM participants and non-participants.

ICM Semi-structured Interviews and Analysis

We conducted 39 total interviews: 21 of which were with DACC leadership and case managers, and 18 of which were representatives of service providers who had active contracts with DACC. Initially, we identified participants through their roles with DACC or contracted service providers, but we further developed our list by asking interviewees for recommendations for additional participants. By asking for these recommendations, we were able to better leverage the unique knowledge and social networks of participants to ensure that we were accounting for all stakeholders.

We conducted semi-structured interviews, where we used a set of broad, open-ended questions with flexible follow-up questions to guide the conversations. The interviews were oriented primarily towards discussions of 'critical incidents', or specific, events with known goals and observable consequences. We asked case managers to relate recent examples of cases managed: one that resolved successfully or in a satisfying fashion, one that resolved somewhat unsuccessfully or in an unsatisfying fashion, and one that involved interactions with law enforcement or members of the courts. We asked service providers and contracted organizations to relate one case in process, one that resolved successfully or in a satisfying fashion, and one that resolved somewhat unsuccessfully or in an unsatisfyingly.

We asked interview participants to relate how information and data were stored, described, and used for each incident, the nature of the collaborative engagements that resolved these incidents, and barriers to the ideal resolution of each case. We also asked participants to relate general opinions on DACC intensive case management processes and procedures, how these processes and the scope of intensive case management work has changed over recent years and in response

to specific policies, and how effectively participants feel they are achieving both programmatic and individual outcomes and objectives. We asked service providers about how their relationship with DACC has changed over time, and how changes to policies or procedures could improve their interactions or strengthen their collaborations with DACC.

We transcribed the interviews and analyzed them using qualitative coding to identify patterns of commonality and difference (known as themes) both within and across interviews. In our coding of the data, we identified several themes which we expand upon in the key findings section. After we developed an initial set of codes and themes, we collaboratively developed and refined these themes to ensure reliability across analysts.

Zoom Meetings with Management

Following the semi-structured interviews with case managers, we conducted an initial analysis of our observations and findings and held informal meetings with DACC team leadership to discuss. We asked for feedback on the themes that arose from our qualitative analysis, then discussed details of staffing, training, and data management from a leadership and strategic perspective.

Team Analysis and Discussion

Concurrent with the leadership meetings, we also shared initial findings with groups of case managers for feedback and brainstorming. We selected these participants based on their prior participation in semi-structured interviews, then according to availability and engagement with our evaluation. During these meetings we discussed the details of daily practice, information management, and collaboration, how case managers made use of their data, and conducted brainstorming on what a more effective waitlist management and case note management software might look like. Following these activities, we conducted a series of design activities and interviews oriented towards thinking through potential software and infrastructure improvements. Our analysis of case note data informed these design activities, which is described below.

Case Note Data Analysis

Case notes constitute chronicled events regarding a client-related interaction. Case managers primarily use these case notes to keep track of prior history with a client and inform decisions regarding the next steps. We received the client and case note data in the form of 2 CSV files in 2 batches. The first batch contained case notes ranging from 10/03/2016 to 09/09/2021, and the second from 10/03/2016 to 09/13/2022. One CSV file contained a list of case notes, each with a set of corresponding attributes including the note's creation date, the authoring case manager, the

client, the set of checkboxes checked, and several others. The other CSV contained a list of clients and their attributes such as demographic information. A list of all the attributes and their descriptions for each table is included in Appendix A. We conducted our initial case note analysis on the first batch of data received.

This data contained 1561 clients and 54,423 unique case notes. The current, updated data contains a total of 1691 clients, 30 caseworkers, and 63,143 unique case notes. It is important to note that the number of unique case notes will differ from the number of case note entries in the provided case-data table because of duplicated entries (each checkbox checked for a case note is recorded with a separate entry with the note contents duplicated).

We conducted the case note analysis with the aim of identifying:
  | DACC's data collection methods and their implications;
  | How DACC can improve its data collection and outcome measures; and
  | Areas where machine learning- supported tools can be used to improve caseworker workflow.

Early on, we identified that a summarization tool would be useful for case managers, since the volume of data per client means that case managers often cannot read every case note before an interaction. We conducted an analysis of case notes to understand patterns in their composition and case managers' writing practices. We selected 10 clients from the original dataset of 1561 clients provided by DACC, which contained a total of 54,423 case notes. We grouped the clients based on their characteristics provided in person data such as mental health, substance abuse, violence, and demographic information such as education, gender, race, and ethnicity. We then picked random clients across groups and analyzed all the case notes related to those clients to identify themes. We divided these themes into three categories based on the goals of the analysis, the structure of the case note content, people/organizations involved in the interactions, and perceived outcomes of the interactions. We validated these themes by iteratively reviewing more case notes of other clients using keywords from the selected clients' notes.

Design Interviews

We conducted a series of design-focused interviews to explore how effective the supportive systems and data available to case managers was in in their work. We designed these interviews to answer questions and fill in the gaps of our initial analysis of case note data. For these interviews, we asked participants to both relate their experiences working with client data, and to imagine how these systems might better support their work.

Case Manager Backgrounds

For both the checkbox and case note interviews, we spoke to roughly the same group of case managers. The case managers come from various professional backgrounds and bring a unique perspective to case management. However, there is a lack of diversity in case manager demographics.

Five of six of the case managers agreed to fill out an anonymous demographics survey. Of the case managers that filled out the survey:
- Four of them identify as female, while one identifies as Non-Binary;
- All five of them are white;
- Two of the case managers are aged 35-44; the other three are 25-34, 45-54, 65-74, respectively;
- Case managers have worked at DACC from three months to seven years;
- Two of them have worked in different positions within DACC; and
- Four of them have worked in homelessness services prior to DACC.

Case Note Data Interviews

We then conducted a separate series of interviews focused primarily on case notes. These interviews aimed to understand the creation and usage of case notes, and ways in which the case note system can be improved. These interviews were split into two stages. The first stage was an exploratory interview, and the second stage was a collaborative design activity.

Stage 1

In the first stage of interviews, we wanted to obtain a big picture understanding of how case managers use and create case notes. We asked questions regarding how case managers refer to previous case notes and what information they look for, and similarly asked about how they write case notes and what information they tend to include or exclude. We asked questions regarding the challenges surrounding their current process, and what tools could assist them in their day-to-day case management. The entire summary interview protocol can be found in the Appendix B.

Stage 2

The second stage consisted of a collaborative design activity in which we asked case managers to annotate a set of client case notes based on a set of goals they would like to see achieved in a summary. We encouraged case managers to follow a think-aloud protocol to fully understand what and why they found certain aspects of the case notes to be important. Following the annotations, we asked case managers to write a client summary with their own annotations available for reference.

We selected a common client which would be annotated by all case managers. This client was not managed by any of the interviewed case managers. There were 17 case notes for this client, and they contained a wide array of exemplary information including discussions of substance abuse, referrals, and emails/discussions with external organizations and agencies.

We first explained the annotation activity to the case managers', and asked them to reflect on and pick from a set of the following five goals they would adhere to as they annotated the case notes:
- Inform the interaction with a client to inform the next steps;
- To use the knowledge when you are interacting with a client for the first time;
- Help understand the longitudinal patterns of the client that can promote self-reflection on your own practices;
- Help assess the outcomes/success of case management over time; and
- Help to have better documentation of the kinds of provided services.

We presented the case notes to the case managers in a table in a google document, and the case managers used the highlight tool to annotate. We reminded case managers to follow a think-aloud protocol to understand why they were highlighting (or choosing not to highlight) a certain phrase.

After the annotation activity, we asked case managers to write a summary for the client who achieved their chosen goals with their annotations available for reference. We did not impose any specific structure and instead allowed them to choose any format they deemed fit. Some case managers summarized each case note, some extracted sentences directly from the original text, while others created different sections they found important, such as the client's known locations, contact information, current medical health problems, etc.

We then repeated this process with another client who we picked from a set of the case managers' own clients. We were missing client data for one particular case manager, and we substituted a different client so that this case manager could still complete the annotation and summary activity.

We rooted our interview methods in participatory collaborative design principles, and we worked directly with case managers to understand the nuances of their roles and to directly bring their expertise to the design process. We conducted all the interviews on zoom, and we recorded them with the consent of the case managers.

Case Note Label Interviews

Our final series of design interviews focused on labels associated with each case note. Before the interviews, we first conducted an analysis of the checkbox data to explore how it is collected, organized, and described for use by case managers. We supplemented this from our discussions with team leadership and case managers, as they described how they interact with data systems in both formal interviews and informal collaborative meetings.

Data Analysis

In addition to the case notes, case managers also record closed-form labels describing the outcomes or nature of a particular meeting with a client. These labels, also referred to as "checkboxes" or "description" in this report, accompany every case note and are selected from a set list in the case management system.

We analyzed this data with the following questions:
| Which labels are used most and least often?
| How skewed is the data?
| How representative of the case note content are the labels?
| Are the labels likely to leave things out that were in the case notes? Or are they likely to include items that did not occur?

Stage 1

In this first set of interviews, we aimed to understand both individual and DACC-wide checkbox labeling practices and their role in case management. We asked questions regarding the purpose of checking boxes, and the process with which case managers determine what checkboxes to check. We inquired about the training and standardization process across the organization, and about the current challenges that surround their checkbox checking practices. We asked about the role checkboxes play in day-to-day case management itself, and asked case managers about their personal experiences and suggestions for improving or altering the current system. The entire checkbox interview protocol can be found in Appendix C.

We elaborate our findings from these interviews in the key findings section of this report, but we identified that data quality (poor recall, to be precise) was a major issue. Our Stage 2 interview, therefore, aimed to improve the quality and quantity of the case note label data.

Stage 2

Based on our findings from Stage 1, we curated ideas for improving the case note label data quality for a total of 16 ideas, which we clustered into three clusters. The purpose of this stage

was to gain insight on the necessity, benefits, challenges, and feasibility of implementing each idea from several stakeholders including both the case managers and upper-case management.

This stage consisted of virtual interviews with one or two case managers at a time. Each interview consisted of a collaborative design activity in which we presented our ideas to the interviewees organized by the three key areas we identified earlier. For each key area, we conducted an individual and a group activity. During the individual component, we used a speed-dating strategy to present ideas, in which we provided interviewees with limited time to look at the ideas for the key area and provide their initial impressions in a separate document. We asked the interviewees to keep in mind the following guiding questions:

- How will this be useful in my daily work?
- Is there somewhere else this would be more useful?
- How can I improve this idea?

We presented the ideas on google slides in a storyboard format. Each storyboard consists of four panels of stick-figure characters walking the reader through an example scenario where the need, application, and result of the idea are showcased. Depending on the idea, we positioned the storyboards from the points of view of different stakeholders such as seasoned case managers, case managers that recently joined DACC, and upper-level management.

After the interviewees had finished providing their individual impressions on each of the ideas from the key area, we moved on to a group activity in which we discussed each idea as a group. We asked each of the interviewees to elaborate on their initial impressions, asked guiding questions, and welcomed disagreement and criticism to fully develop the ideas.

We worked to directly incorporate the case managers and upper management's expertise into the brainstorming process to refine the ideas to best suit DACC's needs. As before, we conducted all the interviews on zoom, and we recorded them with the consent of the case managers. We have provided the set of storyboards, their needs, impacts, and a summary of the interviewee responses to them in Appendix A.

Shadowing and Observation

On Wednesday May 11, 2023, the research team observed DACC case managers on site at One Texas Center. Over the course of a business day, the team observed ten clients as they requested aid with obtaining services on a walk-in basis. Two such meetings were with clients who were currently or had formerly been assigned ICM through a referral from ECHO and the Travis County CoC. Some clients were seeking incentives, such as a bus pass, gift card, or a snack.

Others needed access to a computer: one client wanted to print photos from social media as well as information on bus routes.

Literature Review

Homelessness Case Management

Researchers and practitioners have developed best practices and recommendations for implementing effective ICM models. C4 Innovations, a research institution focused on community health and housing instability, produced a report on best practices for Homeless Services Case Management programs. The report states that movement into transitional and permanent housing is the primary goal for any homelessness case management program.[3] The "Housing First" principle also necessitates case management programs implement other supports for clients experiencing homelessness. Examples of these additional supportive services are substance abuse recovery support and establishing lease and tenant protections.[4] Santa Monica's Homeless Community Court has a primary goal of helping clients attain permanent supportive housing, measuring progress towards graduating the program based on each client's individual plan. [5]

In addition to explicitly setting permanent housing as the primary goal for homelessness case management services, studies show that Critical Time Intervention (CTI) models of case management is an evidence based, effective time-limited method that reduces the likelihood of recurrent homelessness and helps individuals integrate into the community. Research published in the American Journal of Public Health suggests CTI is one of the more effective case management models for homelessness services.[6] Per the Center for the Advancement of Critical Time Intervention, a research center based out of Hunter College in New York, several randomly-controlled trials conducted since the 1990s show that CTI is effective in reducing the risk of recurrent homelessness.[7] CTI is typically a nine month program with services decreasing in intensity over time and involves three phases: transition to the community (upon discharge or entry into case-management services), try-out, and transfer of care. See Figure 1 below for components of CTI.[8] Per a 2021 memo from DACC, DACC's case management seeks to implement services following CTI methodology.[9]

Components of critical time intervention (CTI) in each phase

Phase	Pre-CTI	Phase 1: Transition to the community	Phase 2: Try-out	Phase 3: Transfer of care
Timing	Between assignment and discharge	Between discharge and 3 months after discharge	Between 3 and 6 months after discharge	Between 6 and 9 months after discharge
Responsibilities of CTI worker	Build a relationship	• Build a relationship by working in the community • Assess client's needs and resources • Choose priority areas of intervention • Mobilize support resources and link client to them	• Less frequent contact • Adapt, improve, and monitor resources	• Adapt, improve, and monitor resources • Transfer client to other services • Farewell and termination
Materials[a]	Required: • Intake form • Activity log Optional: • Strengths assessment • Personal recovery plan	Required: • Risk and needs assessment • Strengths assessment • Personal recovery plan • Activity log	Required: • Personal recovery plan • Activity log Optional: Strengths assessment	Required: • Personal recovery plan • Activity log • Closing note Optional: • Risk and needs assessment • Strengths assessment
Intensity	At least two or three meetings with client before discharge, with no more than a month between each meeting (10 h in total)	Average of 3 h per week (36 h in total)	Average of 2 h per week (24 h in total)	Average of 30 min to 1 h per week (6–12 h in total)

Figure 1: Components of Critical Time Intervention (CTI)

Individual case plans are also an integral part of effective case management, including CTI models. Best practices for homelessness case management outline what individual plans should incorporate, such as conducting initial assessments, creating priorities, identifying strengths and barriers, and creating short-term objectives.[10] The Center for the Advancement of Critical Time Intervention, a research institution based out of Hunter College in New York, researches best practices for CTI implementation and emphasizes the importance of establishing long-term plans for clients to adhere to after exiting the CTI model, in addition to the short-term objectives while a client is in a CTI program.[11]

Comparative Case Studies

In 2021, the research team conducted a Comparative Analysis Report, which evaluated five different community court case management programs. See Table 1 for a list of the courts the research team evaluated and their characteristics.

The research team fund that DACC stands out among other community courts for two main reasons. The first is that the other community court case management programs receive client referrals directly from service providers, whereas DACC's ICM accepts self-referred clients. The second is that DACC's ICM's therapeutic case resolution model, which involves tracking client progress over time before offering alternative sentences, is a more time intensive model compared to the model other community courts use.

Table 1: ICM Case Study Background Information

	Intensive Case Management	**Jurisdiction**	**Referral**	**Resolution**
Austin, TX – Downtown Austin Community Court (DACC)	DACC hires case managers on staff.	Limited to downtown, East Austin, and West Campus	Referral comes from voluntary participation, a service provider, or the criminal justice system.	Uses a therapeutic model.
Columbia, SC – Homeless Court Program (HCP)	While participants must show progress, no known formal relationship with providers. Clients do meet regularly with assigned case managers.	Serves Columbia but also the larger SC Midlands region.	Referral comes from voluntary participation, a service provider, or the criminal justice system.	Uses a pure dismissal model.
Maricopa County, AZ – Maricopa County Regional Homeless Court (MCRHC)	Case managers come from homeless service provider court partners and meet regularly.	Serves the state's largest county, including 23 municipal courts and 26 Justice Courts.	Referrals must come from homeless service providers. Self-referrals are never accepted.	Uses a pure dismissal model.
Alameda County, CA – Homeless and Caring Court (HCC)	Case managers come from homeless service provider court partners and meet regularly.	Serves a county of 1.7M people.	Referrals come from homeless service providers.	Uses a pure dismissal model.
San Diego County, CA – Homeless Court Program (HCP)	Case managers come from homeless service provider court partners and meet regularly.	Serves a county of 3.3M people.	Referrals usually come from partners, though individuals can self-refer if they have documented progress.	Uses a pure dismissal model.
Santa Monica, CA – Homeless Community Court (HCC)	Case managers come from homeless service provider court partners.	Serves the chronically homeless in Santa Monica.	Lengthy referral must come from a partner or criminal justice system.	Uses a therapeutic model.

Data, Technology, and Homelessness Services

Communities across the nation and world are using data and technology to serve people experiencing homelessness and eliminate chronic homelessness. Communities are using an equity-based approach in developing these innovative, data-informed solutions to improve equity and minimize disparities. For example, the CoC in Alameda County modeled a homeless response system using racial equity analysis to ensure proposed strategies help the most marginalized groups.[12] Similarly, artificial intelligence researchers from USC worked with the L.A. Homeless Services Authority to revise its homelessness response tools and data systems to address racial biases.[13] Communities that participate in the Built for Zero initiative, such as

Lancaster in Pennsylvania, create integrated data systems and several participating communities have ended chronic homelessness and/or veteran homelessness.[14]

Communities also are developing more efficient and proactive models to allocate homelessness services, while maintaining an equity framework. For example, NYU researchers partnered with Women in Need, a shelter network in New York City, and used data to develop models to predict re-entry into shelter.[15] London, a city in Ontario, developed a [16] San Francisco and Bergen

County, NJ, developed tools and data collection practices to prioritize vulnerable individuals when housing resources become available. [17]

Importantly, many organizations dedicated to ethically leveraging data and technology to improve homelessness service provision also are using data dashboards and performance indicators for accountability. The State of California developed a Homeless Data Integration System that aggregates data across CoCs in the state along with performance indicators to help guide CoC efforts and direct resources.[18] Seattle overhauled its data dashboards to better track homelessness outreach program effectiveness and make adjustments.[19] Hamilton, Ontario, designed a dashboard to display affordable housing data along with homelessness and shelter capacity information to assemble related metrics for the public and policymakers.[20] Dallas and Houston also publish real-time dashboards displaying various performance metrics and demographic information about their clients. [21]

Technology access and data management can impact how organizations that provide services to people experiencing homelessness communicate and operate. The strength of evidence-informed predictions can be improved where close knowledge of people experiencing homelessness complements the knowledge that can be obtained from analyzing population-level datasets.[22] Further, collecting sub-population specific data while involving domain experts and service users can generate relevant evidence-informed insights that may shape public policies to improve the quality of life of people experiencing homelessness. [23]

Personal and private information about people experiencing homelessness may provide guidance for increased, granular service design for more common modes of exiting homelessness or predicting entry into homelessness but enhanced information collection introduces concerns related to privacy and encounters barriers related to self-reporting of information.[24] HMIS data, initially structured to facilitate reporting to the US Department of Housing and Urban Development (HUD), might also be useful in understanding mobility and service access patterns among the heterogeneous population of people experiencing homelessness. However, shifting HUD definitions can make this a challenge if data are not collected according to the needs of such analysis.[25]

Metrics and Outcome Tracking

DACC needs to develop data collection and management systems to support reporting on defined outcomes and objectives which is critical for assessing ICM effectiveness, efficiency, equity, and public accountability. DACC also needs to create tracking metrics and outcomes to create public dashboards and reports, in line with goals of public accountability and stakeholder engagement. Reports are also necessary for policymakers, such as managers and city council, to make policy changes and improvements.

The Comprehensive Evaluation report conducted by the research team in 2022 reviewed metrics. other community courts collect to assess trends, efficiency, equity, and performance.[26]

Examples of these metrics include:
- Number of outreach sessions completed and the number of persons who attended;
- Court appearance rate;
- Length of participation;
- Resolved cases;
- Alternative sentences;
- Housing placement;
- Fines waived;
- Hours of community service completed;
- Sense of victory and freedom;
- Fear of court and its processes;
- Fear of arrests;
- Trust in the court and service providers; and
- Frequency of stakeholder conversations and meetings.

Many cities and organizations serving people experiencing homelessness collect and display various metrics that align with their stated outcomes and objectives. The Coalition for the Homeless of Houston/Harris County displays information via a website with three dynamic dashboards: one for high-level CoC system performance, one for project level performance, and one for community members.[27] Housing Forward in Dallas hosts a dynamic dashboard sorting information by enrollment information, housing placement data, and racial equity analysis.[28] San Diego [29]and Los Angeles County[30] use similar dynamic dashboards, displaying data sliced along demographic and programmatic categories.

Table 2 contains a list of common metrics collected and displayed by cities and continuum of care entities around the country.

Table 2: Common metrics displayed on homelessness services dashboards in other cities

Information collected per client	Race
	Ethnicity
	Age
	Gender
	Household type (single adult, children, etc.)
	First time experiencing homelessness
	Prior residence/living situation
	Monthly income
	Income sources
	Referral method
Aggregate data points	Number of total clients
	Total number of clients
	Total number of households
	Client destination
	Number of days in housing (by type)
	Number of clients referred out and where they were referred
	Number of clients on waitlist
	Average number of days enrolled in program
	Average number of days on waitlist
Financial information	Budgeted amount per program/initiative
	Revenue sources

Limitations

We surveyed a selection of ICM clients, or clients seeking ICM services, across a total of four days. Although we varied the timing of survey collection to try to broaden the range of clients surveyed, we cannot guarantee that the sample of individuals surveyed is representative of all DACC clients. Additionally, our methodology only included surveying clients rather than interviews. Interviewing clients might have yielded qualitatively richer data. Further, as is the case for any survey or interview research, the data collection is potentially subject to self-selection bias, as participants had the option to participate or not, and social desirability bias, where clients' answers might have been influenced by what they expected the researchers might have wanted to find.

DACC's intensive case management model is relatively unique in the United States. Although we performed a case study analysis, other cities do not pursue a similar long-term model, so there is little basis for comparison in how effective DACC's ICM is relative to comparable approaches. Similarly, given distinct differences among cases, relatively little knowledge was available about best practices. Such knowledge is typically held by individuals with experience in the field, rather than being available in durable, shareable, format.

DACC's current budgeting processes, data entry, collection, and management processes cannot provide the information required to develop a robust understanding of DACC's budgetary efficiency. A more comprehensive and consistent budgetary data repository with outcome measures and costs allocated across DACC programs is needed to answer the question in the statement of work regarding whether the value of DACC's ICM goals and services outweighs the cost of producing them.

DACC's information gaps and an absence of a strategic plan did not allow for an accurate assessment of ICM programmatic efficiency. Examples of information gaps include being unable to allocate costs across DACC programs. Inadequate budgetary information and missing data allows for DACC's assistance to other city departments (management of APD contracts, distribution of Austin Public Health vouchers, assisting clients in completing annual Housing Authority mandated verifications) to remain unrecognized by city council and the annual Austin budget. Additionally, without a strategic plan with planned goals, objectives, and outcome measures, a holistic evaluation of the ICM program and budget efficiency was not possible. Lastly, there was not an example in the U.S. that allowed for adequate comparison, although Santa Monica's homeless court was the most similar as it also employs a therapeutic model.

Key DACC ICM Findings

Strengths, Weaknesses, Opportunities, Threats (SWOT)

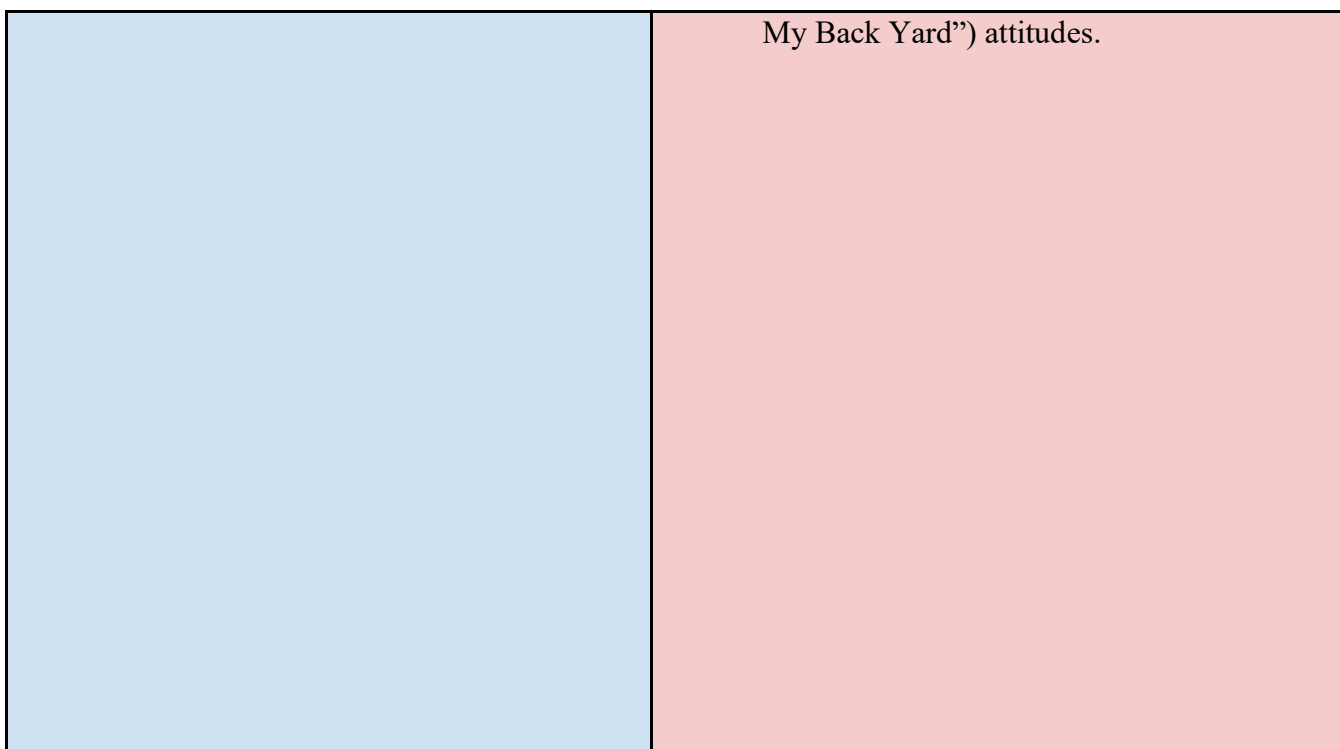| Strengths	Weaknesses:
➔ Shared values of serving clients and ending chronic homelessness in Austin ➔ Case manager expertise & relationships ➔ Access to City of Austin resources ➔ Client trust ➔ Case manager flexibility, responsiveness, and engagement ➔ DACC as a key point of collaboration across the CoC ➔ Community relies on DACC to take on challenging cases	➔ Lack of a strategic plan to guide specific goals, objectives, and outcome measures ➔ Inadequate data systems to support efficient case management and outcome tracking ➔ Absence of consistent, short-term case management plans per client ➔ Lack of stored, institutional, knowledge ➔ Unclear job roles and responsibilities ➔ Walk-in triage services occupying ICM case manager capacity for ICM clients ➔ Opaque and lengthy waitlist process ➔ DACC sees some of the most challenging cases and clients
Opportunities:	Threats:
➔ Multiple programs (ICM and Triage) with multiple entry points (court, referral, walk-in) ➔ City leadership has seen this work as a priority ➔ Expansion to other areas in Austin ➔ Ongoing DACC pilot programs to improve data maximization ➔ Additional permanent supportive housing units ➔ With additional resources, DACC could scale up operations to serve community members citywide	➔ Service expansion citywide would require additional resources and staff ➔ Camping ban ordinance now is citywide, which creates more clients ➔ DACC has a single location, which is not convenient to clients citywide ➔ Housing unaffordability continues to increase ➔ DACC does not have its own housing to provide to its clients ➔ Landlords do not have to accept vouchers ➔ Increasing number of people seeking ICM services on the waitlist ➔ Community support and NIMBY ("Not In

My Back Yard") attitudes.

Figure 2: DACC ICM SWOT Analysis

DACC ICM Strengths, Weaknesses, Opportunities, and Threats

Figure 2 provides a high-level overview of the strengths, weaknesses, areas for opportunity, and potential threats that the research team found regarding DACC's ICM program. DACC staff's shared vision of ending chronic homelessness in Austin along with case manager expertise and relationships are areas of strength. Additionally, client surveys indicated trust in case managers and satisfaction with case managers' responsiveness and client engagement. DACC's access to the City of Austin's resources and role in the broader service provider community also indicate positives for the ICM program.

The lack of a strategic plan with clear goals, objectives, and outcome measures along with inconsistent development of time-limited, individualized client plans represent some key weaknesses for the ICM program in terms of its sustainability and performance evaluation. Other challenges include insufficient staff capacity for ICM and triage clients, a lack of job roles based on staff specialization, and an opaque waitlist process.

Ongoing camping ban policies, broad housing affordability concerns, uncertainty regarding DACC's physical location, and the potential for DACC's expansion to other locations in the city represent potential threats to the success of DACC's ICM program. However, DACC's potential expansion is also an opportunity for the ICM program. Other opportunities include DACC's ongoing strategic planning and data maximization project.

ICM Client Experience Surveys

For the ICM client experience survey, we conducted an exploratory data analysis for clients who are participating in DACC's Intensive Case Management (ICM) program ("participants") and those who are not part of ICM ("non-participants") and compared results between the two groups. The survey results show that most participants of DACC's ICM program have a positive view of their case managers. However, some participants feel that the program does not fully meet their medical, mental health, substance abuse, and basic needs. Those who are not part of the ICM program showed interest in joining, but many were not aware of what the program offers. Comparing the results between ICM participants and non-participants, those who were part of the program had higher scores, indicating that the program is effective. The survey also found that people who have a good relationship with their case managers feel more confident in finding a home. A detailed description is in the following paragraphs.

First, ICM participants showed high scores on every item, with all but two items having a median of 5 (see Table 3). Some of the highest scoring items were "**2: I trust DACC Case Managers**" (mean: 4.8), "**11: DACC Case Managers are knowledgeable about how to find and access necessary services**" (4.8), and "**13: DACC Case Managers are easy to work with**"

(4.8), indicating a positive connection between case managers and their clients. However, some of the items with lower scores were, "**3: DACC is helping me meet my medical needs**" (mean: 4.1), "**4: DACC is helping me meet my mental health care needs**" (4.0), "**6: DACC is helping me meet my substance abuse recovery needs**" (4.1), and "**20: My basic needs (food, housing, security) are being met**" (4.2), which are the outcomes of the service.

For ICM non-participants, the results varied compared to the participants. Although some were not familiar with the ICM program ("**7: I am aware of DACC's Intensive Case Management Program**" (mean: 3.3), "**8: I understand the services provided by DACC's Intensive Case Management Program**" (3.3)), many showed interest ("**9: I would like to learn more about DACC's Intensive Case Management Program**" (4.3), "**10: I would like to participate in DACC's Intensive Case Management Program**" (4.4)). Upon conducting Kruskal-Wallis test, which tests if there is a significant difference between groups (null hypothesis: the medians of the two groups are equal), results for both groups did not have items that were significantly higher or lower than others.

Comparing the results between DACC's ICM participants and non-participants on items taken by both groups, the ICM participants showed higher scores, indicating the effectiveness of the program (see Table 4). In particular, the Mann-Whitney U test, which is a statistical test that evaluates whether there is a difference between the answers specified groups gave, (null hypothesis: there is no difference between the distributions of the two groups) revealed that the item "**I trust DACC Case Managers**" had the most significant difference between the two groups ($p < 0.01$). The other two items that showed a significant difference between ICM participants and non-participants were "**DACC is helping me to find housing**" ($p < 0.05$) and "**I know who to ask for help when I need it**" ($p < 0.05$).

Another notable trend was that respondents who had a stronger relationship with their case managers were more likely to have greater confidence in finding a home ($r = 0.55$, $p < 0.001$). The respondents' relationship with their case managers was determined by calculating the mean of items 1-6 for both groups, while the confidence in finding a house was measured by items 16 and 12 for ICM participants and non-participants, respectively.

Table 3: Summary of Survey Results (ICM Participants and Non-Participants)

ICM Participants							ICM Non-Participants					
#	Field	Min	Max	Median	Mean	Count	#	Field	Min	Max	Median	Mean	Count
1	DACC is helping me to find housing	2.0	5.0	5.0	4.3	20	1	DACC is helping me to find housing	1.0	5.0	3.0	3.2	11
2	I trust DACC Case Managers	4.0	5.0	5.0	4.8	22	2	I trust DACC Case Managers	1.0	5.0	4.0	3.8	14
3	DACC is helping me meet my medical needs	1.0	5.0	4.0	4.1	21	3	DACC is helping me meet my medical needs	1.0	5.0	3.5	3.6	10
4	DACC is helping me meet my mental health care needs	1.0	5.0	4.0	4.0	20	4	DACC is helping me meet my mental health care needs	1.0	5.0	3.0	3.5	11
5	DACC is helping me meet my transportation needs	3.0	5.0	5.0	4.7	22	5	DACC is helping me meet my transportation needs	3.0	5.0	4.5	4.4	14
6	DACC is helping me meet my substance abuse recovery needs	1.0	5.0	5.0	4.1	17	6	DACC is helping me meet my substance abuse recovery needs	1.0	5.0	3.5	3.7	12
7	DACC Case Managers understand me and my needs	3.0	5.0	5.0	4.6	22	7	I am aware of DACC's Intensive Case Management Program	1.0	5.0	3.0	3.3	16
8	I find it easy to contact DACC Case Managers	2.0	5.0	5.0	4.5	22	8	I understand the services provided by DACC's Intensive Case Management Program	1.0	5.0	3.0	3.3	16
9	If I run into a problem with my housing, ID, healthcare, prescriptions, food, or other needs, a Case Manager will be able to help me	3.0	5.0	5.0	4.7	21	9	I would like to learn more about DACC's Intensive Case Management Program	2.0	5.0	5.0	4.3	16
10	DACC Case Managers are available when I need them	2.0	5.0	5.0	4.5	22	10	I would like to participate in DACC's Intensive Case Management Program	3.0	5.0	5.0	4.4	16
11	DACC Case Managers are knowledgeable about how to find and access necessary services	3.0	5.0	5.0	4.8	20	11	DACC's Intensive Case Management Program would help me	1.0	5.0	4.5	4.1	16
12	DACC Case Managers are knowledgeable about how to find housing	3.0	5.0	5.0	4.6	19	12	I am confident that I will find housing soon	1.0	5.0	4.0	3.8	16
13	DACC Case Managers are easy to work with	3.0	5.0	5.0	4.8	21	13	I know who to ask for help when I need it	1.0	5.0	3.0	3.3	16
14	DACC Case Managers are available to meet without much waiting	3.0	5.0	5.0	4.6	21	14	My basic needs (food, housing, security) are being met	1.0	5.0	4.0	3.6	15
15	DACC Case Managers know how to get in touch with me	3.0	5.0	5.0	4.7	21	15	My basic needs (food, housing, security) will be met in the future	3.0	5.0	4.0	4.1	16
16	I am confident that I will find housing soon	1.0	5.0	5.0	4.3	18							
17	I know who to ask for help when I need it	1.0	5.0	5.0	4.3	21							
18	DACC Case Managers care about me	3.0	5.0	5.0	4.6	21							
19	DACC Case Managers care about my success in finding housing and living life	2.0	5.0	5.0	4.4	21							
20	My basic needs (food, housing, security) are being met	1.0	5.0	5.0	4.2	20							
21	My basic needs (food, housing, security) will be met in the future	2.0	5.0	5.0	4.4	21							

Table 4: Comparison of ICM Participants and Non-Participants on Common Items

	Participants	Non-participants
DACC is helping me to find housing *	4.3	3.2
I trust DACC Case Managers **	4.8	3.8
DACC is helping me meet my medical needs	4.1	3.6
DACC is helping me meet my mental health care needs	4.0	3.5
DACC is helping me meet my transportation needs	4.7	4.4
DACC is helping me meet my substance abuse recovery needs	4.1	3.7
I am confident that I will find housing soon	4.3	3.8
I know who to ask for help when I need it *	4.3	3.3
My basic needs (food, housing, security) are being met	4.2	3.6
My basic needs (food, housing, security) will be met in the future	4.4	4.1

Note: *: p<0.05, **: p<0.01 in Mann-Whitney U test

ICM Interview Findings

Our analysis of the ICM Interviews with case managers and contracted service providers identified several themes, which are related in the following sections, organized around these key themes. We refined these findings through informal meetings with case managers and team leadership, where we presented our initial themes, sought input and further explanation of data processes and details of staff training, and explored potential avenues of improvement. Thus, we ensured our findings effectively represented the experiences of case managers and grounded our study in their daily work life.

Austin Homelessness Policies & Housing Affordability

The COVID-19 pandemic along with Austin's rising housing affordability crisis over the last several years led to an increase in the number of people experiencing homelessness in Austin. [31]. Between the increase in people experiencing homelessness and Proposition B, which banned camping within the city, service providers such as DACC also have higher caseloads. When the camping ban passed in 2021, DACC took on additional cases.[32] In 2023, the Ending Community Homelessness Coalition estimates that 4,600 people are on the homelessness continuum.[33]

The City of Austin is engaged in several initiatives and partnerships to create supportive housing units to move people into permanent supportive housing. At the end of 2022, the city reports it is "on track" with the number of permanent supportive housing units that currently exist in the city, with over 1500 units. [34] An additional 1300 permanent supportive housing units are also in development. [35]

DACC is also awaiting Austin City Council's decision as to where DACC will be permanently located. The final location will have significant impacts on the number of clients DACC serves and DACC's ability to meet its goals and objectives efficiently and effectively.

ICM Staffing and Training

DACC's case managers provide ICM services to court, referred, and triage (walk-in) clients. Case managers are not assigned to specific tracks (i.e., serving walk-in clients only versus court-mandated clients) and often have unequal caseloads. Case manager interviews revealed an ongoing expansion of responsibilities beyond what is strictly necessary for intensive case management, such as participation in emergency response, coordination of transportation for cold weather shelters and protective lodges and serving as guides to the overall system of services available to people on the homelessness continuum. The development of the 'triage' pathway to services demonstrates this increase in expected scope and clear job responsibilities are undefined.

Case managers have significant and specific knowledge of how to navigate the various potential sources of support to serve client needs. This information is inconsistently stored in any staff-accessible institutional system and is primarily shared informally and through personal relationships. Additionally, given the rapid turnover within this field, existing established formal transition plans meant to serve as institutional memory struggle to capture the full scope of knowledge held by experienced case managers.

> *"You know, I wasted my time the other day, because the client wanted counseling services. And, you know, I tried to [ask] my supervisor about any in-house contracts we had. And then he told me [that] he wasn't sure and to ask my coworker. Then my coworker told me to ask our boss, and, you know, I was just going back and forth. And so then I just tried to, like, mimic, you know, that previous referral for my client, and it turns out, we didn't have the in house contract anymore at all. So I wasted all of that time for nothing."*

The above quotation from a case manager demonstrated a dynamic present across the case manager interviews – that seeking information on next steps, available contracts, and potential individual contacts represents significant work for both case managers and management. Institutional knowledge management could potentially help reduce the time involved, but knowledge is currently decentralized and inconsistent.

Contracted service providers did not experience this same level of change in scope where their collaborations with DACC were concerned. While contracted service providers were largely positive about their work with DACC, nearly all such contract relationships were static even in a changing environment. For example, few to no service providers mentioned any adjustment to their relationship with DACC during the COVID-19 pandemic, despite the needs of the pandemic substantially affecting processes and responsibilities for DACC case managers. Some service providers indicated that they had capacity that was not currently being leveraged by DACC case management, while others expressed a desire for a closer relationship to ensure their services had a higher level of impact.

Despite these challenges and increased workloads, case managers expressed an appreciation for the ownership they have over their work and their ability to independently navigate contracts and rely on relationships to help serve their clients. Case managers saw activities such as driving clients to meetings or helping clients with grocery shopping as beneficial to their long-term goals, but these are not formally a part of case management responsibilities. This level of flexibility supports the goal- and client-oriented work that case managers discussed in their interviews, but it also complicates potential metrics and outcomes reporting. However, a lack of clear roles and responsibilities based on expertise results in DACC ICM case managers

performing activities that could potentially be completed by other staff, thus freeing case managers to focus on their area of expertise in serving clients.

Triage

Case managers have dedicated caseloads and clients they work with; however, ICM case managers are also providing services to "triage" clients who are not currently part of the intensive case management program. Despite the name "triage", the nature of the work is providing short-term, on demand, aid and advice to clients, rather than fulfilling the traditional triage role of assessing and prioritizing clients according to their needs. These walk-in clients seek assistance for things such as holding mail, obtaining bus tickets, assistance with obtaining documents, etc. Additionally, there is no established process for assessing at check-in whether walk-in clients can be served on-site or need to be referred elsewhere. Assisting walk-in clients who are all seeking various services that require different levels of effort adds work for ICM case managers, who are specialized social workers, and contributes to ICM case manager burnout, which was a concern interviewees raised multiple times in both case manager and service provider interviews.

DACC does not currently track separate triage related outputs or outcomes. Developing triage specific goals and objectives is part of DACC's ongoing strategic planning. Triage clients were reported by DACC leadership to comprise a significant portion of their daily clients, but currently there are no metrics to track how much time is dedicated to serving walk-in clients, nor in tracking their outcomes. Serving triage clients has become a key way in which DACC serves the community and assists both clients and other service providers in finding housing. There is a growing need for dedicated case managers who are not splitting time between ICM and triage clients.

Coordinated Assessment and Client Data

Across the interviews we conducted, we found that contracted service providers use numerous formal and informal criteria to determine eligibility for their services, most tied to personal characteristics or history of people being served. Through formal coordinated assessment, formal instruments, and informal data collection, case managers prioritize access to services, and collaboratively track individual service clients as they progress through different service providers. Through this, case managers also create a record of necessary information for obtaining future services. A key step in this process is coordinated assessment, a required step in homelessness service provision for regions making use of federal funding. However, coordinated assessment tools are imperfect, as argued by a contracted service provider:

"so in my experience, administering it, folks still tend to score pretty low… they added a section to address racial disparities, which is great, but now that's what the assessment is like. You get the most points from that section. And I have patients that are literally dying of stage four cancer on the street, and they score extremely low, and I have patients in full psychosis, like [they] cannot manage their own needs, they score extremely low, right, they're never going to be picked for a program. So I think that it's still very fluid… And folks with severe and persistent mental illness are not prioritized, either."

Service users receive a single score through coordinated assessment, and access to certain resources is gated behind certain assessment scores, making this assessment a particularly consequential point of data collection, and serving as entry into the system. However, many service providers have additional criteria for eligibility, varying according to their specific missions and pragmatically according to their capabilities, as recalled by the following team leader in DACC:

"The way [prioritization is] generally done is through the coordinated entry process. And, you know, each agency sets their criteria for the or the eligibility for their program and, you know, an agency can define their eligibility requirements, however, however, is most appropriate for them."

Data needs tended to be related to what was necessary to gain access to specific services, according to the criteria of specific service providers. Nonetheless, the role of coordinated assessment as a formal intake into the services clustered under the CoC maintained its role as both the de facto data collection instrument and prioritization mechanism. This, however, introduced tensions related to the lived experience of service users. Coordinated assessment can take between 40 minutes and one hour, and ask questions that can be challenging, embarrassing, or otherwise very personal, such as questions about mental health, self-harm behavior, or substance use. Due to both the length of, and sensitive information collected through the instrument, coordinated assessment could serve as a barrier to gaining access to services for some users.

"either some individuals just refuse to take [it]… and that means that individual will never be served… Some of these individuals are just so severe that they just refuse to take that assessment. And then, you know, when the individuals do take it, sometimes their acuity skews their responses. And so it's challenging…"

As stated by the above member of DACC team leadership, many individuals are not able to participate in self-assessment. This comes before assessments conducted by service providers for their own intake criteria, which can add hours of assessment and information collection to the process, as relayed by the following participant case manager.

> *"their intakes [are] extremely lengthy - about two to two and a half hours and very repetitive - which has been really problematic for clients that I work with… there's a window of tolerance there that our clients have, and understandably so, especially when they're being asked to answer, you know, some pretty invasive questions at times as well. It can be really problematic. I've had a lot of clients blow up in the middle of those intakes and leave and because, yes, they have exceeded that window of tolerance and, and then that results in them not getting the care that they need. So it's sort of this vicious cycle."*

Both case managers and contracted service providers noted similar resistance to sharing sensitive personal information, even where the client knows that these are important steps. However, not just service access, but also funding, is determined by personal data collected through formal and informal assessments. Funding can be targeted to certain demographic or other groups as well as for general use, and accounting for those groups provides broader access to funding sources where specialization of efforts is possible. Similarly, accurate counts of people experiencing homelessness in the region aids in creating a case for further funding, and accurate counts of specific needs such as mental health or prescription drug support are vital to ensuring access to that funding. As related by a contracted service provider:

> *"With our outreach screening, assessment, and risk lobbying, the state [are] gatekeepers of state funds. People who don't have insurance have to have [an] assessment to see if the State will pay for their treatment and suffer before they go anywhere else."*

The need for better, more complete, and more accurate data, however, was balanced by, and occasionally in tension with, the desire to support the agency and recovery of clients. In some cases, this took the form of a lighter hand in conducting assessments and collecting personal information. In other cases, it took the form of a more collaborative arrangement, where a case manager would serve as both a gauge of what is normal and as an interlocutor to service providers and systems. As relayed by the below case manager, the lived experience of service users can affect the sense of what is normal, making self-assessment especially challenging.

"because when you're in crisis, you lose perspective of what is a crisis… so if you're in a chronic crisis, which is what we're evaluating, with chronic homelessness, a self assessment tool, in my personal opinion, and my professional opinion [is] not an effective tool, because you're going to ask somebody, is this a crisis? And they're gonna say no, because they have to live in it, you know, so. So there's issues with it regardless. But they did transition away from that."

Care Collaborations

The quantity and type of personal information that had to be shared by people experiencing homelessness before they could access services was considered problematic by many interviewees, from both DACC and among the contracted service providers. Coordinated assessment, even though still somewhat problematic, was seen as a significant step forward in protecting personal information, as related below by a participant from a contracted service provider.

"I've kind of almost become radicalized with how much people experiencing homelessness are asked to decide to divulge their information… Coordinated entry was a response to that, as opposed to having done an intake at every possible agency, you're doing one. I think that's an improvement, because the way it used to be pre 2014... you would have to repeat your story of being homeless three or four times. So is it good that it collects all that information? Probably not. But I think ultimately, over time, it protects clients information better than how we did it pre coordinated entry. I wish there was a way that it could be better integrated into other programs, including RS systems."

When barriers to recovery exist as part of information systems, it is necessary to negotiate and manage not only the recovery process, but also, the information practices themselves - something we saw service providers doing regularly. Interviews revealed numerous 'side-channels', or parallel services, that can be navigated by a knowledgeable representative to find access to services even where they might be ineligible. In cases managed by DACC, clients are assisted with a very broad range of activities, from obtaining ID, to accessing insurance benefits, receiving mental health treatment, and even support in grocery shopping and similar life skills.

Case managers had to address certain needs before others could meaningfully be approached. Clients who had no access to a cell phone, nor a consistent address, could often be difficult to find, and had trouble arriving on time to scheduled meetings (which were quite often assessments in their own right), as related by the case manager below.

> *"It's just difficult with communication a lot of times… part of that is just the nature of being unsheltered. Things go missing and cell phone bills become a low priority, and… making a meeting with your case manager is lower priority. Sometimes when you have to decide [to] find someone to let you stay on the couch… or you can't get a ride or something. So I'm, like, totally empathetic, and like I get in, it's no, I'm not like frustrated, like, in that way about it. It just does make things longer."*

As the above case manager expressed, the nature of being unsheltered itself served as a barrier to participating in a system that relies on organizational time frames and its attendant information needs. Perhaps, then, it is unsurprising that among the case managers and others working directly with service users, that empathy and understanding are key values that inform nearly all levels of organizational and information process. Collaborative arrangements between service providers, through both informal and personal channels, and central information repositories, aid in finding missing clients, in coordinating services, and in sharing necessary information.

At the intersection of the need for personal information to navigate systems and services, and the commitment to supporting agency and recovery, we observed the development of care collaborations between service providers, users, and their data and information systems. These remind us that solutions and improvement to DACC processes must be centered upon the users of these systems, including case managers, clients, or contracted service providers. The lived experience, values, and restrictions of the clients served by DACC provide key points of emphasis in ensuring effective care; services must fit the transportation and communication restrictions of clients; data collection should not be an undue burden on case managers, clients, or contracted service providers; and DACC's effective stewardship of their data is vital to ensuring ongoing trust and future efficiency of service delivery.

ICM Objectives & Waitlist Processing

Moving clients into secure housing is the primary goal for DACC's ICM program, as understood by case managers through DACC's internal goal-setting process. Case managers view a case as unresolved until the client is housed for a long enough period, as defined by the case manager.

However, case plans with concrete goals and short-term objectives are not consistently created for each client. Because of the variable amounts of times clients continue as ICM clients, DACC's ICM waitlist process moves slowly. Based on the interviews, case managers are not always aware of how waitlist prioritization is determined. Individuals may be on waitlists for months or years, and little awareness exists regarding how waitlists are prioritized. The waitlist currently offers very limited possibility for movement based on priority, which interviewees

attributed to the tendency and potential for high-risk clients to occupy top spots on the waitlist while refusing case management.

The nature of homelessness is such that there are both long- and short-term harms, especially where children and youth are unhoused. If one of the goals of intensive case management is reducing individual and community harms of homelessness, consistent evaluation of how clients are prioritized and how the risk of these harms might be reduced is necessary. As a result of both the variable lengths of time ICM clients remain in the program and the lack client understanding of the waitlist program, DACC likely misses opportunities for short-term intervention.

DACC case managers also reported the need to do "all things related to finding clients housing" such as assisting with medical care and prescriptions or aiding in navigating bureaucratic requirements such as obtaining government identification. This is related to the pervasive notion that DACC is the 'provider of last resort'. Leadership advised this can be understood in two ways: first, that Intensive Case Management consistently was able to take on clients who were not able to be served elsewhere in the system; second, that DACC case managers filled key gaps in service provision, such as managing cold weather shelters or protective lodges during the COVID-19 pandemic, that were not filled elsewhere within the continuum of care.

Thus, DACC was seen by its case managers participants and contracted service providers as a vital safety net for clients, both for those who were struggling with gaining access to services elsewhere and for those needs that were unanticipated or not covered elsewhere within the continuum of care. Consistent across the interviews conducted is that there is no 'typical' case, rather that cases are idiosyncratic enough that there are few processes that apply consistently across cases. This points to the tendency of established processes to not account for the range of client needs.

ICM Outcome Measures and Goal Alignment

Beyond the goal of ensuring clients attain stable and secure permanent housing, additional consistent outputs and outcome measures are not clearly described (see ICM Data Systems section for findings regarding DACC's current available data). DACC does publish some data on the City of Austin's Strategic Direction dashboard as related to the City of Austin's priorities. However, interviews indicated that case managers are unclear as to how their work achieved formal outcome measures and are often unaware of what metrics applied to their work.

During the time this program evaluation was conducted, and based on the initial findings that we shared with DACC and our ongoing conversations about these findings, DACC began a pilot data maximization project to refine its data collection practices, support the potential for improved data quality, usability, and the creation of tangible output and outcome measures.

Through our design interviews, our team worked to help identify how DACC data might be made more effective, consistent, and complete.

As previously mentioned, DACC's mission is to end chronic homelessness and move clients into permanent housing. However, DACC does not currently have a strategic plan guiding the development of more specific and tangible goals, objectives, or outcome measures. Additionally, DACC ICM case managers do not currently develop consistent individual client plans with short and long-term goals. This also adds difficulty in assessing whether DACC's ICM is meeting its goals and objectives. During the time this program evaluation was conducted, DACC began working with an external consultancy to help develop a strategic plan to create more specific objectives and measures.

ICM Role in Emergency Response

DACC has played a significant role recently in the City's emergency response. DACC lead and managed the five Protective Lodges (ProLodges) that represented a key response to COVID-19 pandemic. This work was vital to limiting the spread of COVID-19, and entailed the feeding, housing, and support of more than 500 vulnerable community members during the years of the pandemic.[36] DACC case managers also played a key role in ensuring access and transportation to cold weather shelters during recent winter storms, alongside their other roles in emergency response. This is an expression of the notion that arose in interviews that DACC is the provider of 'last resort', playing a vital role in resolving unanticipated crises across the city.

Design Findings

We conducted a design-focused analysis of case note data, case note label data and record-keeping practices among case managers. The preliminary findings derived from the analysis of case notes and case note labels directed our team's investigation into the requirements and potential solutions for efficient use and recording of case data during design interviews. We present these findings in the following sections, organized chronologically as we progressed through each step of this collaborative design process.

Case Note Data – Descriptive Analysis

Case notes provide details including the general demeanor of the client, the discussions that occurred, any next steps, and services provided to or requested by the client. The level of detail in the notes ranges from mere scheduling or rescheduling information to a wealth of in-depth description of emotional conversations. Case notes constitute action items such as updating an application, renewal, housing options; status updates such as job, service req, mail receptions, requests for pass/cards/services; and potential next steps if a client requests/visits about something and direct snippets from email conversations.

We performed descriptive statistical analysis of the case notes to understand how the 54,423 case note data provided was distributed across clients and case managers. The primary parameters measured were number of case notes, and the length of case notes (number of words). Seventy-five percent of the clients had less than 30 case notes and only a few outliers had more than 400 case notes. On an average, the data constituted about 2000 case notes written per case manager, with few exceptions of more than 4000 case notes per case manager. Seventy-five percent of the case notes have fewer than 550 words with an average of 390 words and a maximum of about 800 words.

How are the contents of case notes structured?
The content of the case notes presented five major recurring themes:

- *Client or case manager action*s: Actions taken by the client or case manager as part of the interaction. Examples include starting a housing application, providing bus passes, sharing relevant documents;
- *Client or case manager sharing information*: Communicating recent updates with respect to the client or their tasks. Examples include updates on client's behavior, housing application status updates, available services for the client, recent client activities such as getting a job or falling sick;
- *Requests*: Expressing the need for specific services, resources, or actions by the client or case manager. For instance, the client may request a day bus pass, while a case manager may request the client to contact them once they moved into their apartment;
- *Scheduling and tracking*: Case managers schedule meetings and keep track of activities with the client, and they record several back-and-forth conversations that ensure successful meeting schedules and completion of assigned client tasks. For example, if a client missed their appointment today and requested to reschedule for tomorrow, the conversation is recorded with the new meeting time; and
- *Conversation snippets*: Sometimes direct excerpts of emotional conversations and email snapshots are recorded. For example, statements such as *"I hate that I'm not part of the planning in my child's college decision. He is now 18 and I haven't seen him in months"* by client are noted word for word.

Some case notes directly copy and paste interactions such as emails with other service providers, while others describe the interaction and note the next actions required. Case managers write case notes in various tones, such as first-person tone ("I completed the client's housing application") or third person tone ("This case manager completed the housing application for the client"). Case notes may vary slightly for ICM and triage clients. Triage case notes generally cover immediate steps and services rendered, while ICM case notes may cover a longer-term

plan and more personal details. The jargon used in case notes may also vary and can be inconsistent, hindering others' understanding and retrieval for later use. For instance, "Alameda house" and "CCH" are used interchangeably to denote the same service, while several acronyms such as CLT for client, CMS, or CM-S, OCCM, SI/HI, PES, SOAR, p/u, PDP, and SSVF are present in the notes.

We identified several opportunities for improvement based on our analysis of the case notes:

- Clients often shift between different case managers, or a client's case can extend over multiple years. In either of these cases, it can be difficult for the case manager to retrieve all that happened in a client's history;
- Caseworkers can also miss previous information that a client may have provided to them. For example, one case involved a client who asked a CM to fill out a housing application, but this fell off their radar due to day-to-day requests;
- Often, a detailed medical or housing history for a client can be buried in the case notes. Currently, case managers use standard search based on identified key words which may not retrieve all the relevant information;
- Looking at one case note may not always provide the complete context of why something is needed (ex: Why contact a specific person?) unless previous case notes are reviewed;
- The caseworker records the client's physical or mental condition during office visits, such as being intoxicated, wounded, experiencing a mental breakdown, or using substances; However, this information may or may not be present in the case notes, which means one must go through the entire case note to identify it before meeting with the client;
- Case manager's work on client requests over several interactions, this progress is recorded inconsistently across several case notes. A case manager has to manually scrutinize several case notes to identify the progress on a specific task or activity over time. A request typically is in one of the five states: requested, in progress, provided, approved, or denied; hence, recording this information consistently can make it easier for both caseworkers and management for reference; and
- Case notes encompass tasks assigned to various individuals or organizations, including primary caseworkers, temporary caseworkers (for instance, CM X would assist the client in scheduling HACA eligibility appointment on 2/28 to obtain vouchers while primary CM is unavailable), DACC officials, external organization members (for instance, client's treatment providers or housing service managers), and the client. Streamlining this information enables identification of delays in case progress by tracking required actions or updates from different involved parties.

Case Note Label Data: Descriptive Analysis

Case managers also record dropdown labels describing the outcomes or nature of a particular meeting with a client. There are two primary types of labels--"Contact Type" and "Interventions." These are inputted separately and the nature of the labels within each of these types vary. "Contact Type" labels generally refer to the nature of the interaction (whether direct or indirect, for example) with the client. The most used labels in this category are "Direct Contact," "Collateral Contact," and "Client Contact in Office."

The "Interventions" labels are currently in a separate section of the user interface, though the "Contact Type" data generally covers several intervention fields as well. These refer to specific actions taken, and are less commonly used, according to our interviews. This data is arranged in a hierarchy--there are five total top-level interventions (ex: Housing, Income, etc.), 26 programs (specific service providers), and 17 outcomes (ex: Accepted, Denied, etc.). The most common intervention is "Income," the most common program is "Income Sought," and the most common outcome is "Earned Income."

For "Contact Type," the data we analyzed was the second set of data that covered a larger time frame, extending from October 2016 to September 2022. In total, there were 154,545 labels selected for 89,017 case notes and for 6,234 clients, bringing the average number of labels checked per case note to 1.74. The labels selected are quite skewed--56.5% of all labels checked are either "Direct Contact" (n=56,727) or "Collateral Contact" (n=30,625). Additionally, the number of labels checked has generally trended upward, starting with 12,871 for 2017 (the first full year in the dataset), and increasing to 48,248 in 2021. This can be partly explained by the increase in the number of clients (1,219 in 2017, 2,152 in 2021), and the increase in the number of interactions with clients (9,082 in 2017, 23,665 in 2021). However, the average number of checkboxes checked per case note has also increased, from 1.44 in 2017 to 2.13 in 2021.

The "Interventions" data covers the time period from January 2016 to December 2022. In total, there were 3,515 Interventions recorded for 2,454 case notes, for an average of 1.43 Interventions per case note recorded. These interventions are also skewed--the "Income" category accounts for 2,668 records, which amounts to about 76% of all interventions recorded.

Case Note Interviews

Stage 1

Through these interviews, we learned that the primary goal of referring to case notes in case management is to inform the next steps during an interaction with the client. Additionally, when interacting with the client for the first time, it is important to gather client details and prior work. Case managers use case notes to document services provided to clients, keep track of important

information, and support the work of other case managers should the client transition to a second or later case manager.

These interviews shed light on the type of information case managers seek from case notes for effective case management and difficulties faced in the process:

- **Case managers need to identify behavioral attributes of the client prior to an interaction.** Attributes of client such as being "more confrontational with women than men," as well as safety concerns such as suicidal ideation informs case manager's approach during client interactions;
- T**he relevance of the case note content to the present situation is crucial.** That is, significant mental health concerns that are currently relevant, rather than information from several months or years ago that may no longer apply. For instance, recent instances of depression and suicidal ideation should be highlighted, while substance use may not be necessary to be included unless there are specific safety concerns. Information related to mental health, housing, and medical aspects should only be shown if it is currently impacting the client's situation;
- **There is a difference of opinion among case managers on accessing detailed client information before interacting with the client.** Some argue that knowing too much beforehand can lead to biases, while others believe it prevents clients from having to repeatedly share their story and trauma. However, the main concern among case managers is that the information in the summary should not create biases about the client. For instance, revealing excessive details about the client's mental or criminal history can impact the case manager's decision-making. It is important to not hold onto someone's worst moments indefinitely;
- **Case managers often struggle to quickly access contact and login information for multiple client accounts.** This includes details such as driver's license number, Social Security number, account login information, phone number, email, and address, which are scattered throughout unstructured case notes; and
- **The use of various acronyms also complicates the case managers' ability to conduct simple searches in the case notes.** Having the ability to search keywords is not sufficient when people use acronyms and alternative writing styles.

Case managers highly resonated with the need for tools such as summaries for improving access to client data that will greatly enhance their ability to retrieve important information for effective case management. In the stage 2 interview findings, we provide the critical information that should be easily accessible to case managers in client summaries.

During the Stage 2 interviews, case managers shared their valuable insights on the usefulness of case note content in informing next steps, providing client overviews, and documenting services provided. Through a collaborative design activity, case managers had the opportunity to reflect on what truly matters by evaluating a simulated scenario of creating a summary for a sample client.

By conducting a thorough analysis of case managers' preferences and the summaries they generated, we were able to identify the critical information essential for effective case management. We organized this information into different categories based on their specific discussions, such as medical, housing, and mental aspects. Here are the details of each category:

Housing information: knowing previous housing outcomes and options explored will help in making effective choices for further exploration:

- Status of last submitted applications, whether they are currently under screening or if a screening has been scheduled;
- If the client has been previously housed;
- Discussed housing options and the client's opinion which informs which options to explore next;
- Associations relevant to housing, such as HACA, PSH/RR (Permanent Supportive Housing/Rapid Rehousing), and their position on housing waitlists;
- Coordinated Assessment (whether it has been completed, scheduled, or still needs to be administered, including the date of the event);
- Keywords that identify important housing-related explorations, such as PSH, RR, HACA, and CA;
- Details regarding these applications and contacts at relevant organizations;
- Any obstacles or roadblocks encountered during the application process, such as a criminal history causing issues with background checks; and
- Housing history, including information on previous housing and locations.

Medical health information: an overview of medical health enables the case manager to provide comprehensive assistance and support the client in achieving self-sufficiency:

Medical care

- Details about medical care, including the doctors involved and any scheduled appointments. Identified repeating patterns in health issues;
- If there is a specific treatment, it should be highlighted, particularly if it is scheduled or recently completed;
- Any instances of discharge against medical advice (AMA);

- The client's interest or denial of a specific treatment; and
- Current prescriptions and medication information.

Mental health

- Any indications of suicidal or homicidal ideation;
- Recent concerns that may impact safety;
- Previous attempts to seek treatment;
- Mental health diagnoses, such as anxiety, OCD, etc., along with descriptions; and
- Current treatments, prescriptions, and other relevant details.

Substance abuse

- If the client is about to undergo detox, has recently undergone detox, or if it is scheduled;
- Repeating mentions of substance abuse;
- Past attempts to seek treatment; and
- Information about rehab centers or programs.

Contact information: having all the potential ways to contact the client at one place is crucial to follow up with the client at any time:

- Client's contact - email and phone, whether they have a DACC phone;
- Number of DACC phones issued in last three years;
- Emergency contact, current associations/relationships (family, partners, children);
- Current or previous locations of meeting with the client which could be potential places to find the client if needed;
- Other case managers at DACC previously involved with the client.

Referrals and Other Organizations: contacts at other organizations, referrals to other programs allows easy access to find point of contact and follow up on pending tasks:

- Referrals provided to other organizations and their count if multiple;
- Other case managers assigned to this client (the most recent mention of this);
- What services the other organizations are currently providing (SU treatment, housing assistance, etc.);
- Email/phones, designation, name and organization of contacts in other organizations.

Vital Documents: stored location or application status for Texas driver's license , birth certificate, social security card, etc. enables to ensure the proper management and retrieval of these vital documents when needed:

- The latest known stored location of a vital document;

| Whether a document has been given to the client;
| If there is a pending application for ordering a document;
| Current barriers preventing the ordering of a document, such as the client needing to call the Social Security office;
| If a document is currently being processed and requires follow-up; and
| If a client mentions losing a document and needing to reorder it.

Case Note Label Analysis

Stage 1

In our interviews with DACC managers it became clear that improving the quality of the checkbox/label data is a priority of DACC and extremely beneficial for many reasons. Currently, a monthly "checkbox report" is generated for upper management to understand how often services are provided, and as a general progress report for DACC. This data is used to provide a clear, quantitative account of services rendered, number of clients seen, and workload distribution. While not explicitly used for funding purposes, the checkbox report has the potential to affect resource allocation and funding decisions. For example, if a checkbox report revealed an increase in ID documents ordered, more funding and training can be allocated to vital document-related services.

In addition to providing information for resource allocation, better checkbox data could improve case manager workflow and shed a light on invisible work case managers conduct. For example, if the labels assigned to a case note were more representative of the full content of the case notes, then case managers could more quickly understand a particular client's case, as opposed to having to search through many free-text case notes. Because the labels are closed form (such as dropdowns), they can more easily be compiled to capture complex work conducted by case managers. For example, it is easier to acquire the cumulative counts for the label "Client birth certificate," as opposed to going through unstructured textual case notes and picking out keywords.

However, this checkbox data has certain limitations that prevent it from being meaningfully used for the above purposes. The checkbox data currently has high precision (if a label is selected it is most likely applied correctly), but low recall (the lack of a label does not mean it is not applicable for a particular case note). Our interviews revealed that the reasons for this are multifaceted.

First, the case managers rely primarily on the case notes and information stored in a shared Google Drive to conduct their daily case management. Consequently, the case note labels are of little benefit to the case managers from their point of view. Additionally, case manager training

generally tells case managers to focus on the most common labels, with "Direct Contact" and "Collateral Contact" being the most important for understanding the number of clients served. Other labels, that concern the specific services provided are not emphasized as strongly in case manager training; therefore, the value in selecting them is not clearly seen.

Additional factors play a role--the current user interface (eCourt) is confusing for case managers and the case note entry is duplicated in the UI. For example, "Interventions" is in its own section of the UI and has a second box for a case note. Case managers are unlikely to write two case notes for the same interaction. Another factor is the label set itself is the result of many years of modification. This led to many unclear and redundant labels where case managers do not always know which label to select for a certain scenario. Overall, these reasons--UI issues, conflicting training, and lack of intrinsic motivation-- all may contribute in part to the low recall in label data.

Each of these barriers can be addressed in various ways, either through modified training, UI adjustments, or assistive tools. These various solutions are addressed in the next section.

Stage 2

The second stage of our interviews consisted of a "speed dating" study where we presented case managers with 16 design ideas developed to address the needs discovered in Stage 1. These ideas were presented as quick, easy-to-digest storyboards where fictional case managers would interact with new tools or designs that the idea presented. The 16 design ideas covered a wide variety of topics, but can be grouped into three main categories, with five to six ideas under each category:

1. *Aligning data collection with organizational goals***:** This category deals with ideas that integrate data collection efforts with DACC's overarching goals and can help with general case management evaluation or resource allocation.
    a. *Streamlining new checkbox addition process by caseworkers:* Allows for case managers to propose checkboxes to be added;
    b. *Filtering of case notes based on checkboxes:* Allows for case managers to use the checkbox data directly, by allowing case notes for a client to be filtered by label;
    c. *Machine learning-backed tool to identify redundant labels based on case note content and prior labeling:* Allows for managers to identify different checkbox labels that are used for similar situations to eliminate redundant labels;
    d. *Analytics dashboard showing label trends on a per-client level:* Allows for case managers to review a summary of the client they may not be familiar with;
    e. *Design checkboxes to better document key outcomes and caseworkers' work*: Increases the granularity of the checkbox data to better capture currently unaccounted work; and

f. *Software tool to help balance caseloads across the organization:* Allows for managers to better evaluate caseworker's caseload balance to make informed adjustments.
2. *Supporting training and data standardization*: This category deals with recommendations for training and standardization that will better enable case note label data collection and get all stakeholders on the same page.
   a. *Standardize case note writing protocols:* Create a standardized template for case notes;
   b. *Dashboard presenting information regarding the impact of the labeled data:* Create an outcomes dashboard to show the impact of case manager's work;
   c. *Expanded definitions and usage for each label:* Allows case managers to expand definitions for checkbox labels;
   d. *Show labels that have never/rarely been used:* Shows case managers a list of labels rarely or never used before closing out a note; and
   e. *Periodic training on checkbox use cases:* Provide ongoing training as a refresher on checkbox label standards and definitions.
3. *Streamlining data input and interaction for case managers***:** This category contains recommendations for a data system, and what features that system may support. These recommendations can enable DACC's search for a new case management system.
   a. *A machine learning-supported tool that suggests relevant labels based on case note content:* Shows case managers a list of recommended labels based on case note content;
   b. *Presenting client's labeling history and most recently used labels:* Allows for case managers to see the most and recently used labels across all of one client's notes;
   c. *Searchable interface for labeling:* Allows for case managers to search checkbox labels;
   d. *Feedback by providing reminders of the goals of labeling:* Feedback and reminders in the UI regarding the impact of checking the checkboxes; and
   e. *Visual cues to guide through different types of case note labels:* Interface adjustment that will guide the case manager through different categories of checkboxes and provide reminders.

Case managers approached the storyboards from their own experience and personal backgrounds, which inform how they approach clients. Overall, most of the storyboards elicited comparable, effusive feedback from case managers during the interviews. Within each category a selection of storyboards resonated with the interviewees more than others. These are noted in the corresponding sections below and include a summary of the general response from interviewees.

Case managers identified primarily with storyboards that would save time reviewing and completing case notes and improve the clarity and functionality of the checkboxes as it aligns with their current workflow. The storyboards that case managers were hesitant about created a new workflow or situation that did not align with their current process. For example, in category three the storyboard titled "Visual cues to guide through different types of case note labels" received mixed feedback from case managers during the interviews. While some case managers resonated with the concept of a visual cue to ensure all relevant boxes were properly checked, others thought the additional element would slow down their process. For the case managers who did not resonate with this idea, the pain point of saving time was the most important aspect of improving their workflow.

Aligning data collection with organizational goals

The first category focuses on improving the checkbox data collection by aligning the process with organizational goals. Currently, the checkbox process is cumbersome and confusing. Case managers resonated with the storyboards in this section because it addressed their major pain points of saving time and simplifying the checkbox process. The participating case managers mentioned how it took a long time to read through all the checkboxes and know what checkbox to pick for which situation. All of the case managers mentioned how the checkbox labels have changed over time, but the corresponding labels have not been modified in the system. Improved checkbox labels to better capture client outcomes and caseworkers' work resonated with case managers. Many of the participants expressed how much of their work goes undocumented and improving the checkboxes would lead to better outcomes.
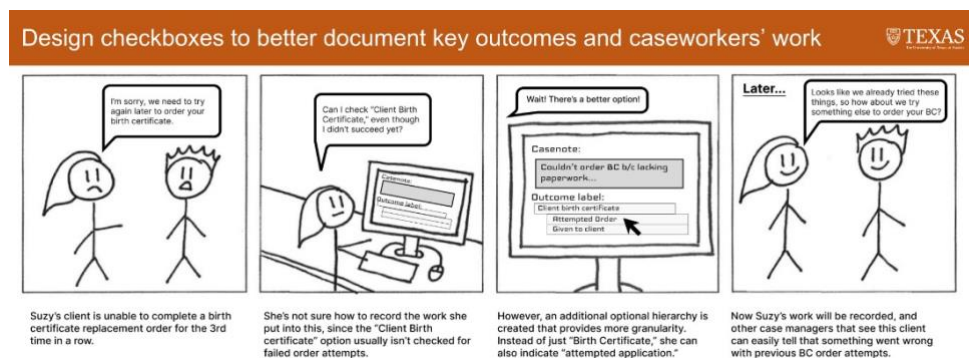
Improving services provided to clients was also mentioned repeatedly by case managers in this category of storyboards. Improving the checkbox label accuracy and functionality would make it easier for case manager to better serve their clients, identify potential behavioral issue related to safety, and help identify new solutions based on label data. The storyboard related to balancing caseload was also included in this category, as it would provide transparency into all of the work a case manager is handling at any time.
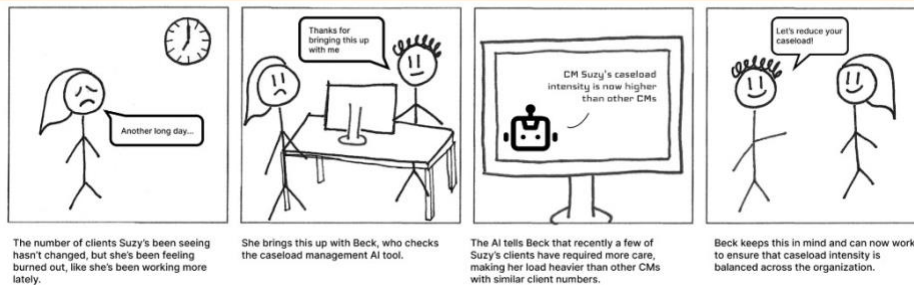
The client level dashboard also resonated with case managers in the focus group. Case managers mentioned being able to quickly see on a dashboard if a client has a behavioral issue, has hit the maximum orders for birth certificates or other documents, and other trends would save time and ensure the case manager was focusing on the right solution. The specific information of what should be included in the dashboard needs additional exploration to ensure the most useful information is displayed.
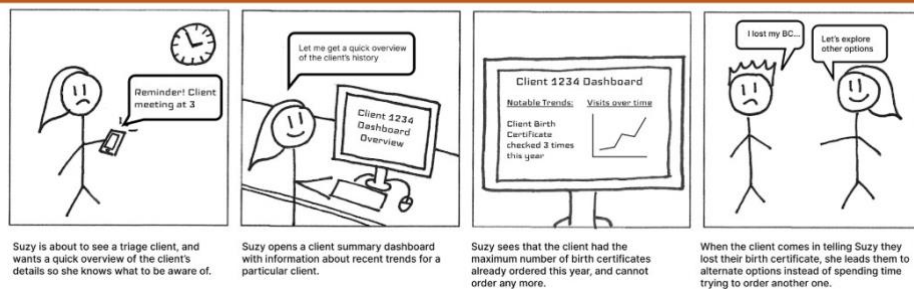
Supporting training and data standardization

Ongoing training and discussion of best practices for checkbox labels came up organically in storyboards prior to this section and resonated profoundly with the focus group participants. Case managers mentioned their willingness to participate in a monthly or quarterly meeting to review the checkbox labels and ensure case managers were refreshed on best practices. Training is provided during onboarding as a new case manager, but afterwards in essentially nonexistent. Case managers must learn on their own by asking questions or through trial and error. Ongoing training was recognized as being able to improve the quality of case notes and ensure all case managers were on the same page.
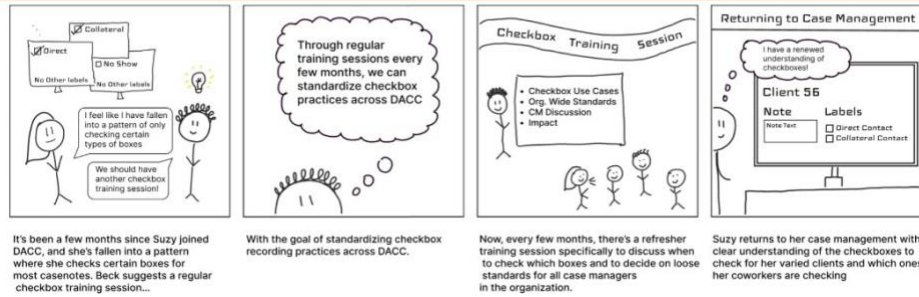
Standardization of writing case notes also resonated with focus group participants. While there was some hesitation from case managers regarding the extent of the standardization, other case managers explained how it would make the writing process faster and easier. Striking a balance between a standardized format and not over prescribing the note writing process is important to saving time. The storyboard adding expanded definitions to the labels received high positive feedback. The participants mentioned not being sure what certain labels specifically mean and feeling on unclear on when to check what. Expanded definitions would help solve this problem and improve the accuracy of the overall labels.
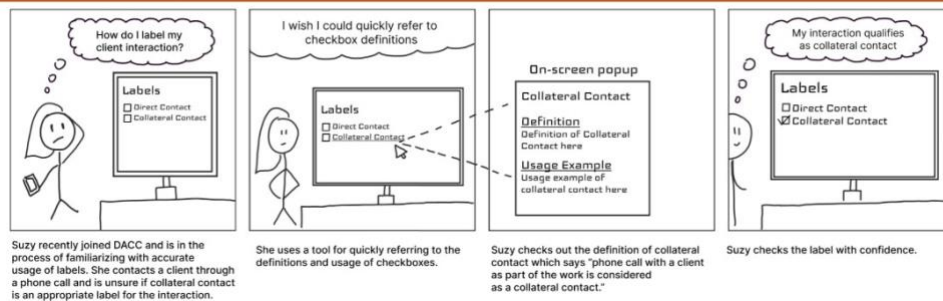
Streamlining data input and interaction for case manager

The final category focused on improving the data input and interaction with the checkbox labels for a case manager. The idea that resonated the most added search functionality to checkbox labeling. All of the case managers interviewed mentioned using CTRL+F to do a direct search of notes. Improved search functionality would save time by making it easier for case managers to find the correct label and to review previous notes quickly for important information.
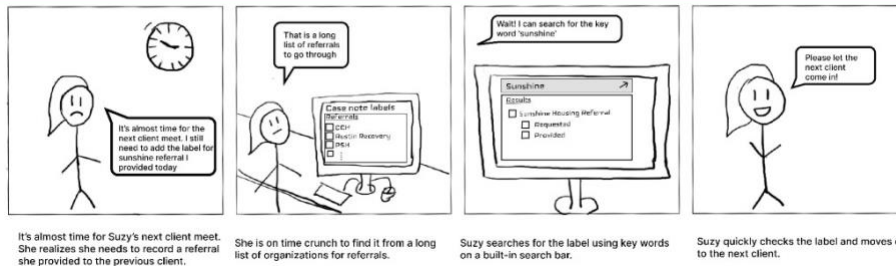
The other storyboards received mixed reviews from case managers in this category, and positive feedback depended on a case manager's tech and data experience. Several of the case managers mentioned that visual pop ups with label reminders and trends would slow them down and get annoying after a while. When implementing visual cues for suggesting relevant labels and a guide for the checkbox labels, the accuracy of the model and design of the interface is very important. Otherwise, the feature could become a blocker to case managers when completing the checkbox labels.

Shadowing and Observation

On Wednesday May 11, 2023, the research team observed DACC case managers on site at One Texas Center. Some walk-in clients were seeking more substantial assistance. One client began the application for a Federal Communications Commission Lifeline program which provides cell phones to low-income individuals. Another client sought assistance with updating her documentation with HACA as a part of the lease renewal process. One long-term client had not seen the case manager in over a year and had successfully transitioned to permanent supportive housing. He only returned because he had lost access to his driver's license and needed DACC to print a new copy for him, which was possible through DACC's internal case management system. These interactions seemed to vary based on how familiar the case manager was with the client and their needs.

DACC case managers stated that services were the same, whether a client was connected through the court, through a referral from the CoC, or from a walk-in. From shadowing, however, we saw signs of differentiation. One client waited through the walk-in process, though she was a part of one on-duty case manager's caseload. As a part of that process, she arranged transportation from the case manager using a city-owned vehicle to an important meeting with the Social Security Administration. One important hurdle for walk-in clients was self-direction. When walk-in clients first came in, the case manager would ask what help they needed. Often, the needs were based on the present day or, rarely, a more acute crisis (i.e., imminent eviction, replacing a lost

document or valuable). Most of the client interactions we observed were focused on meeting the clients' immediate needs.

One challenge we observed was difficulty in getting clients access to coordinated assessment, largely due to the limited time frame in which DACC case managers were able to conduct these assessments. Case managers noted, based on DACC's current resources, that they were only able to conduct coordinated assessments on Wednesday afternoons. This represented a challenge for clients seeking coordinated assessments. Our research team observed that walk-in clients had very limited history in HMIS, which made providing longer-term services difficult for the case manager.

Case managers checked and updated internal data systems with case notes. One challenge we observed was that long-term clients had numerous case notes which can present challenges in data management and interpretation. Consequently, case managers would make additional calls to clarify details. For one such phone call, the case manager spent about five minutes in their email inbox searching for the resource's phone number. These observations suggest that relationships are the strongest knowledge system at DACC, and that often, the database tools merely support existing social infrastructure rather than drive new technology-first behaviors.

Recommendations

We make the following recommendations for DACC's ICM program, based on our literature review, collaborative design interviews, surveys, and semi-structured interview analysis.

1. **DACC's resources should be commensurate with the scope of its work.**

DACC case managers fill additional roles in city-wide emergencies and assist clients who have complex needs. As part of DACC's ongoing strategic planning, DACC should identify its specific goals, objectives, outcome measures, technology needs, and other resources needed to fulfill the mission of the ICM program. The results from this strategic planning should guide the implementation of our recommendations.

2. **Develop clear and documented goals, objectives, and outcome measures for the ICM program.**

Per the recommended best practices from our literature review and our case study analysis, DACC should develop clear and specific goals, objectives, and outcome measures for the ICM program. Creating tangible goals will aid in assessing program effectiveness and identifying areas for improvement. Specific objectives and outcome measures that align with these goals, along with individualized case plans per client, will better enable DACC's ICM to follow critical time intervention practices of transitioning clients to long-term care. DACC can investigate adopting a similar model to the Santa Monica Homeless Community Court with an end goal of each client attaining permanent supportive housing and intermediate progress points of attaining emergency or transitional housing.

3. **Create separate processes and goals for serving walk-in clients.**

DACC's ongoing strategic planning process should include the development of specific goals and processes for triage/walk-in services. Additionally, DACC should allocate staff members specifically to serve walk-in clients.

4. **Clarify DACC staff job descriptions and training processes.**

DACC needs to create clear job descriptions and specializations to effectively use staff time and skills. ICM case managers, who are trained social workers, should have clear job roles, while other DACC staff should have responsibilities over other DACC services outside of case management. DACC should also revise ICM training processes to ensure that all clients receive consistent services, from intake to case planning, and connecting clients to external services. Training and frequent professional development can help ensure ICM case managers are aligned in how to effectively use city resources to serve ICM clients.

5. **Develop standardized intake and individualized case plan protocols**

DACC leadership should develop standardized intake processes for all clients entering DACC. This standardized intake process should contain all data points needed for waitlist prioritization and for reports and outcome measures. Individual, short term, case plans following critical time intervention best practices should also be created for each client. In addition to standardized intake processes, protocols, and case plans, DACC leadership should establish points of contact for connecting clients to various resources and services. Consistent protocols help to create institutional memory, to create consistent experiences for all ICM clients, and to minimize the amount of time and energy ICM case managers spend finding the appropriate contact information or process to help meet client needs.

6. Improve ICM waitlist management

DACC's ICM waitlist processes should follow a standard prioritization protocol, developed by DACC ICM leadership, and the protocol should align with a standardized intake process. All waitlist additions should follow the agreed upon protocol and there should be one database with waitlist data that contains up-to-date information. DACC should explore different mechanisms of prioritizing clients (such as by how close a client is to being permanently housed, or by level of immediate risk) to support more efficient and effective service provision. Clients could potentially be 'triaged' according to their situation, immediate goals, and level of need for Intensive Case Management to support a more responsive and effective waitlist. The waitlist prioritization categories and protocol could enable ICM case managers to serve high-priority clients as quickly and efficiently as possible.

7. Improve budgeting practices

DACC needs to develop a more detailed budget that specifically attributes operating and salary costs to each of DACC's programs to be able to evaluate programmatic efficiency. DACC should also define benchmarks and develop methods to compare programmatic costs to the costs saved due to DACC's programs (such as the cost of healthcare, criminal justice, etc.). Subsequently, DACC will be able to demonstrate the economic impact of its work.

8. Improve data systems

Currently, DACC ICM case managers rely on information for various information sources including eCourt, HMIS, and DACC's own internal systems. DACC and the Communications and Technology Management (CTM) Department should develop an internal data system that integrates key information from external sources to facilitate case management as well as develop reports and dashboards. eCourt cannot fully fulfill DACC's needs—DACC needs a dedicated data management system. In searching for a different system, DACC should consider the following features:

| *Capability for case managers to suggest new labels*: The case management software for case managers should have a formal avenue to suggest new labels for managers to then review and approve.
| *Allowing case note editing after creation:* Case managers should be able to edit case notes and labels to correct incorrect or bad data, something eCourt does not currently support.
| *Searching capabilities*: The case note interface should allow case managers to easily search through both the content of the case notes and the checkboxes checked for a case note. The interface should also support keyword search through the list of labels when writing a case note.
| *Built-in definitions and case studies:* The interface should also, if needed, present definitions of various commonly confused checkboxes and use case studies to refresh the case manager.
| *Integration with other systems*: The system should have all the important information about a client in one place, with no need to go to a secondary location (such as a Google Drive folder) in day-to-day case management.

9. Track output and outcome measures to evaluate efficiency and effectiveness

DACC data systems and processes should track ICM and triage output and outcome measures. Outputs and outcomes in Table 1 in the literature review and case studies section lists data points that are collected and displayed by homelessness services providers in other cities. In addition to the data points listed in Table 1, DACC should track outputs and outcomes related to goals and objectives included in its strategic planning as well as metrics that measure:

| Housing vouchers provision and utilization;
| Clients who lose housing (transitional, emergency, or permanent);
| Direct cash or financial assistance provided by DACC to a client;
| Clients cycling between case managers;
| Contract performance with other service providers;
| Dismissed cases; and
| Client meeting goals identified in individualized case plan.

10. Develop external ICM dashboard and reports for public engagement

Output and outcome measures should be displayed via dashboards and reports that are updated in real-time. Specific versions should be developed for different needs. For example, reports and dashboards can be used to communicate ICM program activities and needs to city council or specific commissions and to the public. Dashboards and reports should be published on the City of Austin's open data portal and on DACC's website.

11. Improve case note entry processes

DACC can simplify the case note data entry process, ensure consistency, and improve accessibility for case managers and clients by standardizing data entry. Standardized data entry can facilitate more efficient information retrieval, such as:

- *Standardized acronyms:* Establish consistent language in case note writing, such as creating a dictionary of alternative terms that convey the same information. This will enable more accurate search for relevant client information.
- *Standardized recording of services and referrals:* Ensure a uniform approach to documenting information related to services, based on whether they are requested by the client, suggested to the client, approved/declined, or in the process of application.
- *Streamline scheduling meetings:* Separate client meeting schedules from case notes by implementing a system similar to Google Calendars. Maintain a history of past meetings, track current scheduled meetings, and provide status updates. This streamlines the current system of scattered scheduling details across multiple case notes.
- *Documenting passes or cards provided:* Use a structured format to record information on requested, provided, or other statuses related to passes or cards given to clients.
- *Provide accessible updates on application status:* Establish a way for clients to check on their application status through automated systems, such as an online portal for checking status, a messaging system for requesting updates, or an in-office interface for clients to visit and obtain updates.

12. Improve data quality and use of the checkbox and case note data

After compiling feedback on the design ideas presented to the case managers, we recommend the following improvements to the quality and usefulness of checkbox data:

- *Regular training for checkbox data entry.*
- *Data dashboard for outcomes tracking:* Develop a data dashboard for internal use by case managers that may contain the following features:
  - Funding information;
  - Client-level checkbox trends; and
  - Referral information.
- *Update checkboxes to include the following modifications:*
  - Combine redundant labels. Several labels are legacy labels or have very similar meanings, which should be consolidated to assist case managers in determining when and how to use them.
  - Add new labels to capture wider ranges of the work that case managers enter. Labels need added granularity to account for events not currently being captured, such as failed applications.

13. **Explore improving caseworker workflow with machine learning-supported tools**

Software tools powered by machine learning can automate work that case managers previously did manually and capture previously unseen patterns. Case managers and other stakeholders at DACC responded positively to the following options:

- *Case note summarization tool:* A summarization tool would help caseworkers to quickly digest synthesized information from all of a client's case notes. Our collaborative design interviews revealed the information that case managers find most important in case notes, which can be used to develop the machine learning model.

- *Checkbox suggestion tool:* This tool would make use of prior data to suggest checkboxes that should be checked while a case manager is writing a note. This will serve as a reminder to completely check all relevant boxes for a note.

- *Redundant label identification tool:* This tool will analyze general trends in case note content and checkboxes checked for those case notes. If two checkbox labels appear to be redundant, the tool will highlight this.

- *Caseload balancing tool:* Currently, DACC uses a manual spreadsheet to track caseload intensities. This tool would automate this and use the case note content to capture caseload intensity changes to balance caseloads more actively across the organization.

- *Task reminder tool:* This tool would provide reminders of pending tasks mentioned in the case notes. For example, if there was an upcoming appointment for a client, or if a benefit needed to be renewed.

Appendix A: Data labeling: List of ideas and storyboard

Aligning data collection with organizational goals

1. Design checkboxes to better document key outcomes and caseworkers' work
   a. **Need:** Case managers do not get credit for all the work they do, since interactions usually encompass more activities than is currently recorded
   b. **Idea:** Allow for ALL activities completed during an interaction to be recorded in the labels, which may mean expanding checkboxes to record currently uncaptured activities
   c. *Impact:* More recognition for the work case managers do, and better statistics for DACC to share with other organizations *for funding purposes*

Suzy's client is unable to complete a birth certificate replacement order for the 3rd time in a row.

She's not sure how to record the work she put into this, since the "Client Birth certificate" option usually isn't checked for failed order attempts.

However, an additional optional hierarchy is created that provides more granularity. Instead of just "Birth Certificate," she can also indicate "attempted application."

Now Suzy's work will be recorded, and other case managers that see this client can easily tell that something went wrong with previous BC order attempts.

2. Streamlining New Checkbox Addition Process by Caseworkers
   a. **Need**: Currently there are insufficient checkboxes that do not capture all the work of caseworkers. There aren't checkboxes for all the different things that case managers do.
   b. **Idea:** Provide a way for caseworkers to propose checkboxes. Ex: assisted in filling applications, ordered/applied/denied status, etc.
   c. **Impact**: Efficient recording of interaction outcomes. Motivation to caseworkers to efficiently check boxes.

Suzy spent a meeting working with a client to renew their SNAP benefits.

When Suzy goes to indicate this in the outcomes dropdown categories, she notices that there isn't a field for SNAP.

Through the interface, Suzy suggests that a label be added to indicate that SNAP benefits were renewed.

Other caseworkers have had similar experiences, so the new label gets added. All the work Suzy does in helping clients get their SNAP benefits can get recorded.

3. Case note Filtering based on Checkboxes
    a. **Need**: Caseworkers need to use the checkbox data themselves
    b. **Idea:** Allow for filtering of case notes based on checkboxes
    c. **Impact**: Case managers themselves will benefit from better checking the checkboxes, motivating them to check more.
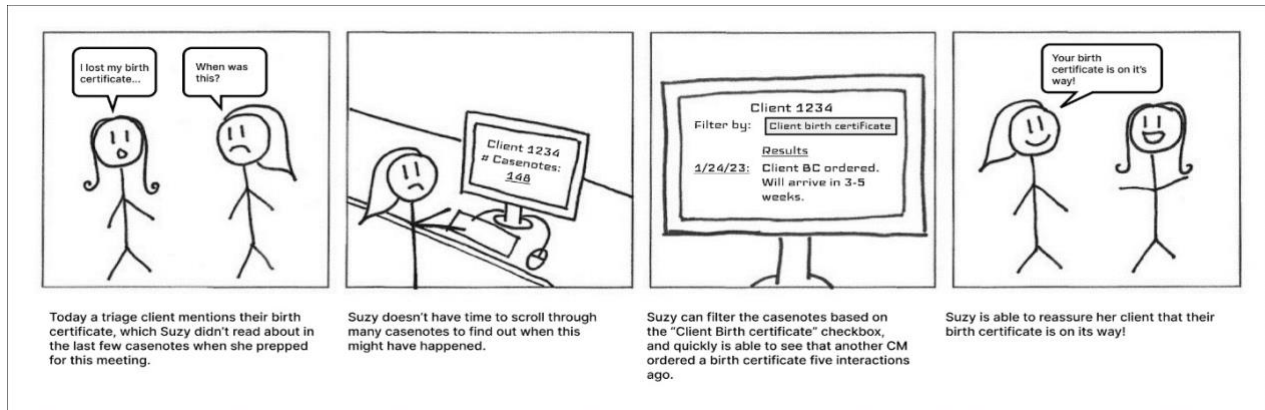
4. Software tool to identify redundant labels based on case note content and prior labeling
    b. **Need:** Redundant checkboxes
    c. **Idea:** NLP tool to identify redundant checkboxes used in similar situations, so upper management can later choose to consolidate them
    d. **Impact:** More standardization, clearer definitions for checkboxes
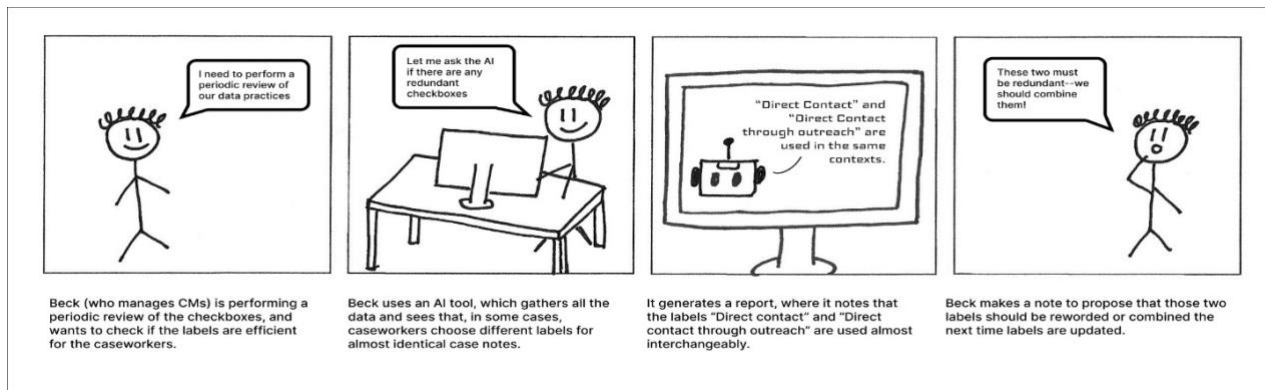
5. Analytics dashboard showing label trends on a per-client level
    a. **Need:** Caseworkers need to use the checkbox data themselves
    b. **Idea:** Client trend charts based on the checkboxes.(Ex: #housing applied with dates, #service denied, #no shows, etc)
    c. **Impact:** Case managers themselves will benefit with better decision-making based on client trend information.

Suzy is about to see a triage client, and wants a quick overview of the client's details so she knows what to be aware of.

Suzy opens a client summary dashboard with information about recent trends for a particular client.

Suzy sees that the client had the maximum number of birth certificates already ordered this year, and cannot order any more.

When the client comes in telling Suzy they lost their birth certificate, she leads them to alternate options instead of spending time trying to order another one.

6. (Only for ICM) Tool to help balance caseloads across the organization
   a. **Need**: Different clients need different levels of care, and an unbalanced caseload can lead to case manager burnout
   b. **Idea**: Tool that tracks the level of care needed for particular clients, and notifies case managers or upper management if caseloads are becoming unbalanced (some CMs unexpectedly have more intensive clients than others).
   c. **Impact**: Balance the caseloads of CMs based on the level of care certain clients need. Decrease burnout in case managers that may accidentally be assigned too many high-intensity clients.

The number of clients Suzy's been seeing hasn't changed, but she's been feeling burned out, like she's been working more lately.

She brings this up with Beck, who checks the caseload management AI tool.

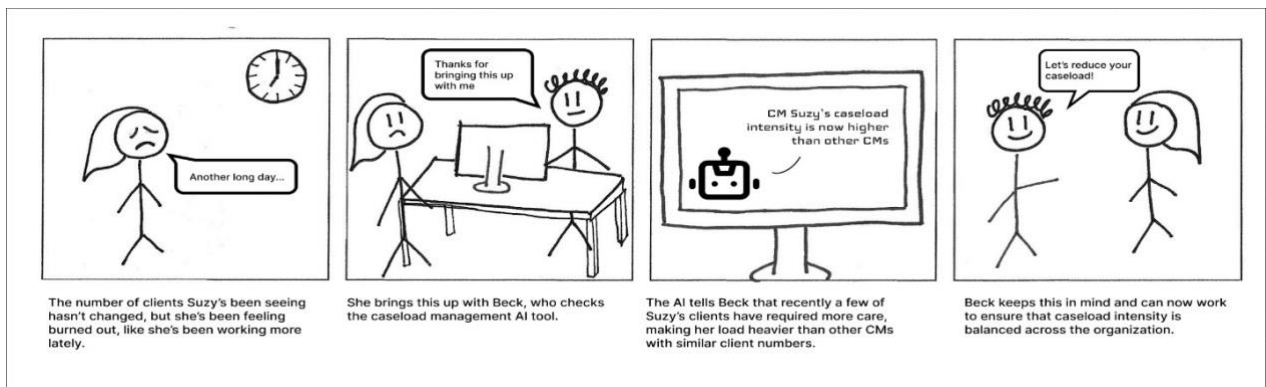The AI tells Beck that recently a few of Suzy's clients have required more care, making her load heavier than other CMs with similar client numbers.

Beck keeps this in mind and can now work to ensure that caseload intensity is balanced across the organization.

Supporting training and data standardization

7. Standardize case note writing protocols
   a. **Need:** Case managers' write a lot of useful information in their case notes, but there is no standard format or set of guidelines resulting in a lack of consistency in case notes across case managers.
   b. **Idea:** Standardizing case note writing protocols to provide a loose set of guidelines and format to case managers
   c. **Impact:** This will result in easier data-sharing and understanding across the organization. Furthermore, standardization will aid in designing and improving future NLP tools.

Daniel, a new CM, just had his first client interaction and is unsure about how to structure his casenote and what details to include.

Beck, who oversees CMs, also observes that case managers include a lot of detailed and useful information in their notes, but that there is no standard format of writing case notes

With the help and input of the CMs, Beck creates a set of standard case note writing protocols to provide a loose set of guidelines and format to case managers

CM Daniel writes finished the client casenote with the help of the standard structure while maintaining his own style of writing and case management.

8. Dashboard presenting information regarding the impact of the labeled data
    a. **Need:** Lack of context on how important it is to accurately check boxes
    b. **Idea:** Provide updates on how the checkbox information is being used, such as funding changes and the relation to label trends.
    c. **Impact:** Able to directly connect their work to the outcome. Motivation through social/individual contribution.

Suzy sees a lot of clients, and is curious to see if the extra time she spends on collecting data and checking checkboxes is worth it

Suzy opens up an outcomes dashboard...

...and sees that other organizations regularly refer clients to DACC for ordering identity documents because the checkboxes clearly indicate how many and how often they're ordered

Suzy feels a renewed motivation to make sure her work in ordering vital documents continues to be recognized since it is actively helping clients find their way to DACC.

9. Expanded definitions and usage for each label
    a. **Need:** Ambiguity in contextual relevance of checkboxes
    b. **Idea:** Expanded definitions and usage for each checkbox
    c. **Impact:** Clarity on if a checkbox if relevant and standardized recording through common definitions
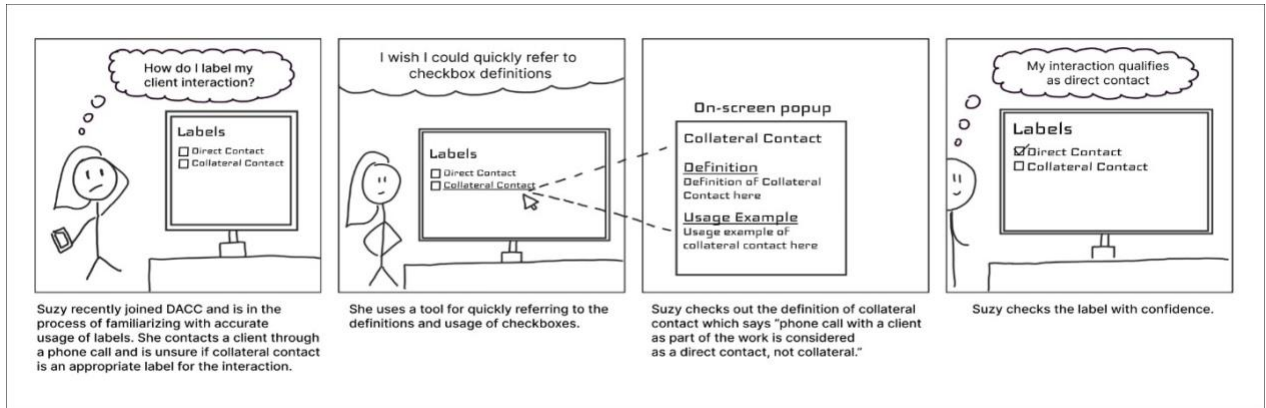
10. Show labels that have never/rarely been used
    a. **Need:** Used to checking few primary checkboxes, lack of attention to others
    b. **Idea:** Show boxes that have never/rarely been checked by the individual case manager and the organization as a whole.
    c. **Impact:** Ability to re-evaluate and expand on checkboxes considered to check, as well as social learning based on organizational trends.
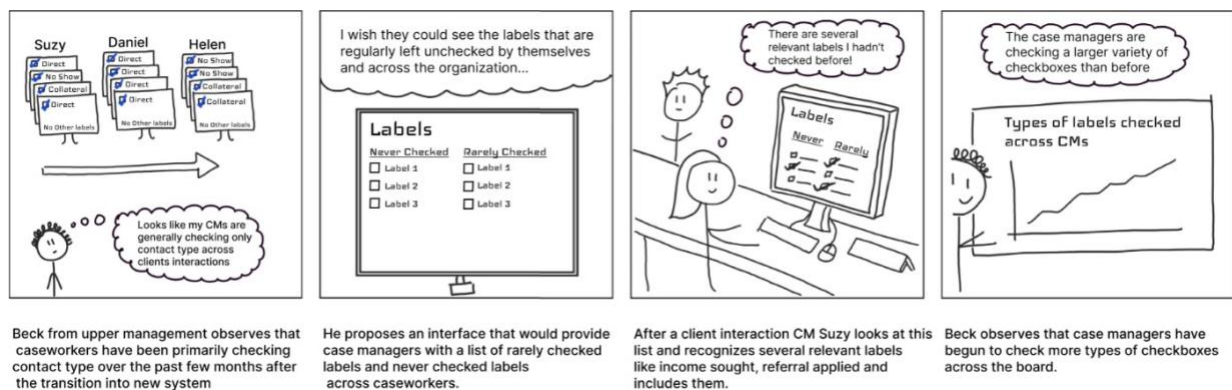
11. Periodic training on checkbox use cases
    a. **Need:** Differences in understanding of checkbox relevance and importance
    b. **Idea:** Streamlined training of checkbox process to new and continuing case workers. Trainers should follow a specific training protocol that we recommend.
    c. **Impact:** Standardization of checkbox recording across case managers

It's been a few months since Suzy joined DACC, and she's fallen into a pattern where she checks certain boxes for most casenotes. Beck suggests a regular checkbox training session...

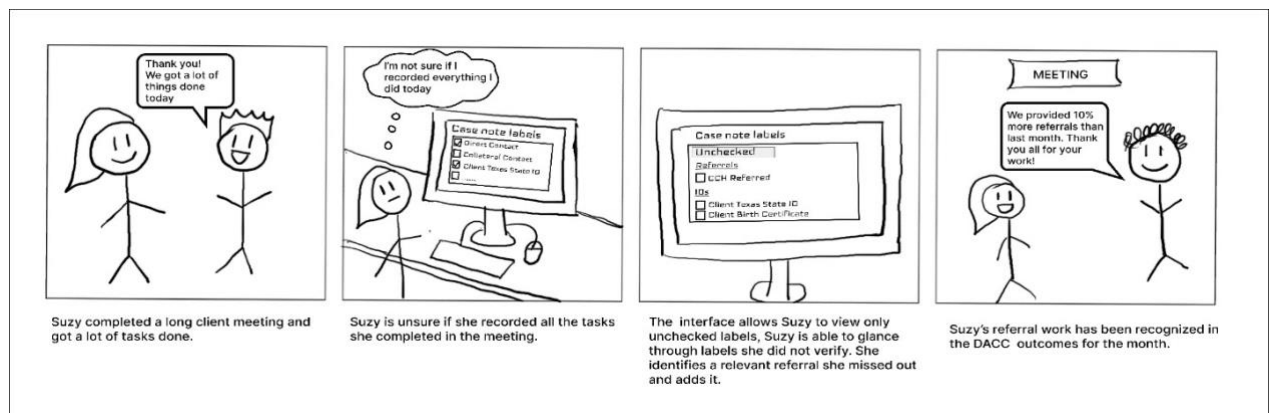With the goal of standardizing checkbox recording practices across DACC.

Now, every few months, there's a refresher training session specifically to discuss when to check which boxes and to decide on loose standards for all case managers in the organization.

Suzy returns to her case management with a clear understanding of the checkboxes to check for her varied clients and which ones her coworkers are checking

Streamlining data input and interaction for case managers

12. Visual cues to guide through different types of case note labels.
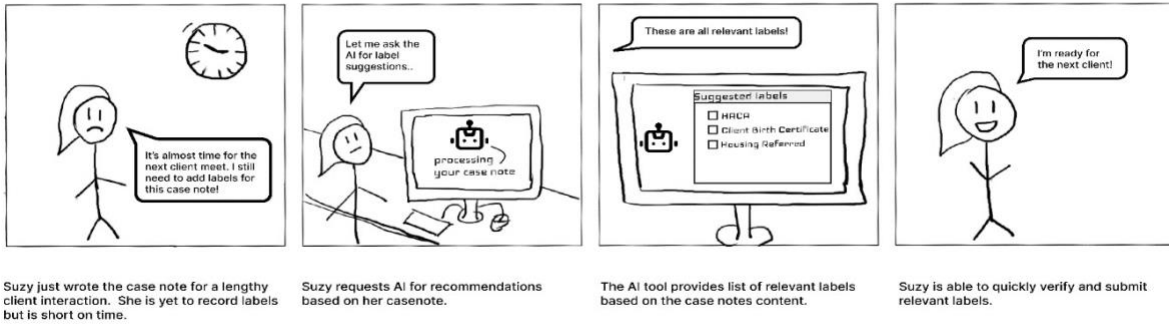   a. **Need:** Case managers do not review through all the checkboxes to identify relevant ones
    b. **Idea:** Visual cues to help keep track of reviewing of checkboxes, such as confirmation messages. (Separate out the different categories of labels (referrals, contact type, etc)
    c. **Impact:** Remind CMs to review all the checkbox categories for relevance

Suzy completed a long client meeting and got a lot of tasks done.

Suzy is unsure if she recorded all the tasks she completed in the meeting.

The interface allows Suzy to view only unchecked labels, Suzy is able to glance through labels she did not verify. She identifies a relevant referral she missed out and adds it.

Suzy's referral work has been recognized in the DACC outcomes for the month.

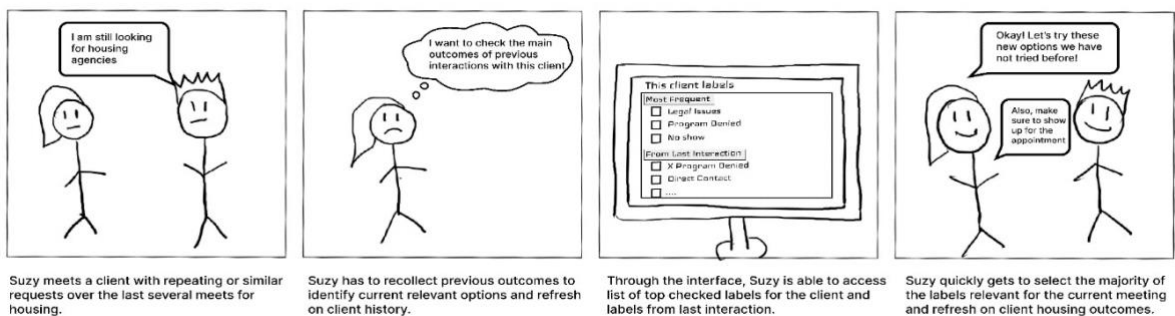13. Tool to suggests relevant labels based on case note content
    a. **Need:** Time and effort to remember and check ALL relevant check boxes
    b. **Idea:** Software tool that provides suggestions of relevant checkboxes for a case note based on its content
    c. **Impact:** Reduces the step of searching for checkboxes and prioritizes decision making for relevant boxes to check.
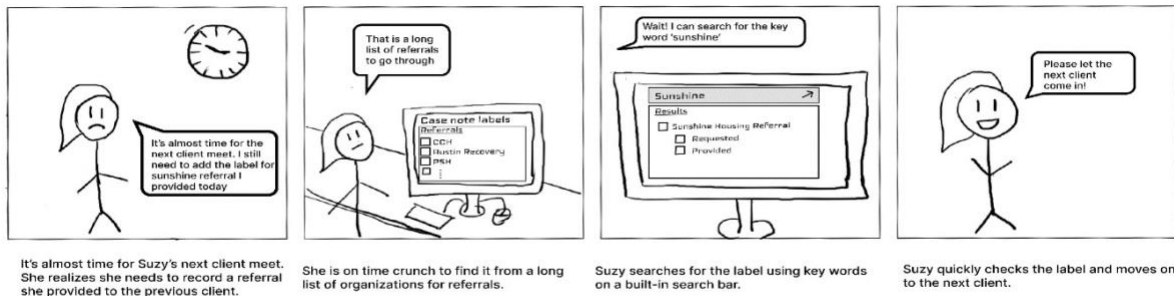
Suzy just wrote the case note for a lengthy client interaction. She is yet to record labels but is short on time.

Suzy requests AI for recommendations based on her casenote.

The AI tool provides list of relevant labels based on the case notes content.

Suzy is able to quickly verify and submit relevant labels.

14. Presenting client's labeling history and most recently used labels
    a. **Need:** It takes effort to recognize all the checkboxes to be checked for each interaction
    b. **Idea:** Providing information on checkboxes checked for the same client previously (ex: last interaction)
    c. **Impact:** This can be a refresher on the client's history as they tick boxes
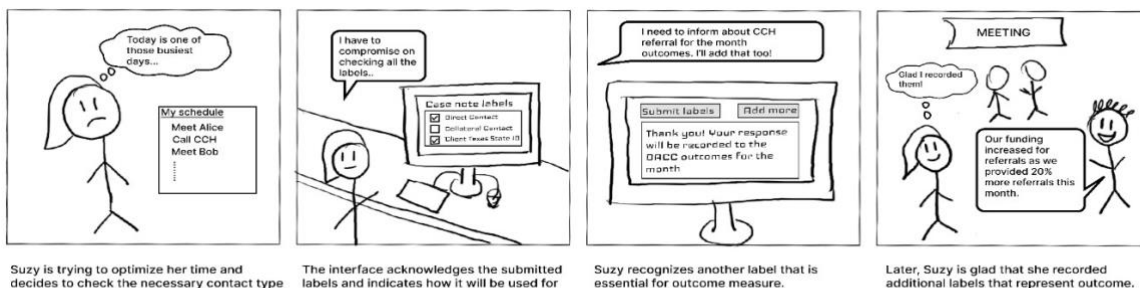

Suzy meets a client with repeating or similar requests over the last several meets for housing.

Suzy has to recollect previous outcomes to identify current relevant options and refresh on client history.

Through the interface, Suzy is able to access list of top checked labels for the client and labels from last interaction.

Suzy quickly gets to select the majority of the labels relevant for the current meeting and refresh on client housing outcomes.

15. Searchable interface for labeling
    a. **Need:** Going through the list of all checkboxes is time consuming
    b. **Idea:** Searchable interface for checkboxes
    c. **Impact:** Gives case managers the ability to not have to go through every checkbox, saving them time

It's almost time for Suzy's next client meet. She realizes she needs to record a referral she provided to the previous client.

She is on time crunch to find it from a long list of organizations for referrals.

Suzy searches for the label using key words on a built-in search bar.

Suzy quickly checks the label and moves on to the next client.

16. Feedback by providing reminders of the goals of labeling
    a. **Need**: Checkboxes are additional tasks to their case management flow. Thus there is a need to be motivated and have a sense of purpose to perform the labeling
    b. **Idea:** Acknowledging and reminding the goal and importance of the labels checked by case managers.
    c. **Impact**: motivates case managers to label more effectively and think through all the outcomes of their interactions that are to be recognized.

Suzy is trying to optimize her time and decides to check the necessary contact type label for her interactions.

The interface acknowledges the submitted labels and indicates how it will be used for outcome measure.

Suzy recognizes another label that is essential for outcome measure.

Later, Suzy is glad that she recorded additional labels that represent outcome.

Appendix B: Case note interview protocols

Stage 1:

General questions about work processes and identifying needs
1. How and when do you refer to case notes?
2. What are the challenges in this process?
   a. Most challenging and why
   b. What type of workarounds have you used to help you with this?
3. If you could create a tool to support referring to case notes, what would it be?
4. What features should this tool have in order for it to add value to your work?
5. Is there data you don't have access to, that you think would be useful for you to access?
6. How can your current data interface (eCourt) be improved so you can better access and use the data that has been collected?
7. With the data you are currently creating (case notes, checkboxes, etc), is there any other use for that data that is currently unrealized?

Is there any data that you collect that you *don't* use? Could it have any potential applications somewhere else?

Stage 2 Collaborative design:

Introduction(3 min)

Hi! Thank you so much for constantly taking out time to help us with this project! Today, we will continue our exploration of building summaries for case notes by engaging in a collaborative design activity. That is, we will ask you to work on building summaries that could be actually useful for you or other caseworkers. We will work on 2 clients, for each client, we will first ask you to go through all their case notes and highlight what you consider important for summarizing. We will then ask you to write a summary for that client based on what you highlighted. You can always refer back to the original case notes in this process. This study will take approximately 1 hour.

Any data, recording, or other personal information collected about you will be treated confidentially and used solely for the research. We will anonymize your responses and the anonymized data may be used to share the results externally.

Before we start, Would it be okay to record this session?

Think aloud

We are going to use a "think-aloud" protocol for this study. This means that we are going to ask you to talk through your thought and feelings as you work on the activities, so we can get a better idea of your needs and preferences. Try to tell everything you are thinking, what you are reading, what and why you are highlighting, and what you are writing in the summary. We don't want you to plan out what you say. Just act as if you are alone in the room speaking to yourself.

Pre-session Questions(5 min)
Before we move on to our first client, we would like to ask you some questions.

How do you see yourself using the summary in your work?
1. *What would you want the summary for?*
2. *What would you use it for?*
3. *Why do you think a summary will be useful in this case?*

After they answer, show the following goals and ask their feedback [Goals link]

Do you see a summary addressing any of the following?
1. *Inform the interaction with a client to inform the next steps*
2. *To use the knowledge when you are interacting with a client for the first time*
3. *Help understand the longitudinal patterns of the client that can promote self-reflection on your own practices*
4. *Help assess the outcomes/success of case management over time*
5. *Help to have better documentation of the kinds of provided services*

Awesome! Thank you for sharing.
What use case we just mentioned do you think you'll be writing a summary for today?
Now, let's move on to the summary writing activity.

Activity(45 min)

Overview of the case note structure and document
To perform the activity, we will first share a google doc with all the existing case notes for a client. The doc consists of a table with notes, date written, and checkboxes checked. You can use the highlight tool to highlight any information you consider to be useful for you to write the summary. After going through all the case notes, we will share another empty document where you can write the summary for the client. You can look at the highlights and the case notes at any point if needed.

COMMON CLIENT(20 min)

I) Present the document with all the case notes.

Instruction
We will now share a document with all the case notes for a client managed by one of your coworkers. Here is the document for the second client. There are #n case notes for this client. Please go through the notes and highlight what you think should be included in the summary. Please note that although personal information has been changed for anonymity, please treat the notes as if the information (such as phone numbers) is real.

While reading and highlighting, please try to "think aloud" about what you are doing and why you are doing it. Why you are highlighting something, etc

II) Present them with the second empty document.

Instruction
Now, build the summary based on what you highlighted, and what you think would be most important. You can structure it any way you want. Make sure to build it so you would find it most useful for the goals you have indicated(how to interact with client, reflect on progress and outcomes Name them).It can be as long or as short as it can be. Any structure you prefer. You can write or copy/paste. And, you do not need to include everything you highlighted in the summary. You can refer to the highlights and original case notes if needed.

As you write the summary, please try to "think aloud" about what you are writing and why you are writing that.
Additionally, you might find it useful to do a "split screen," so you can view both the case notes and the summary at once.

Post-task question(2min):
Has reading through this client's case notes influence your perspective on case note writing practices in any way?
Is there anything that you may have considered changing based on this experience?

THEIR CLIENT (20 min)
I) Present the document with all the case notes. [link to doc]

Instruction
We will now share a document with all the case notes for one of your clients with the date of entry. Here is the document for the first client. There are #n case notes for this client. Please go through the notes and highlight what you think should be included in the summary.

While reading and highlighting, please try to "think aloud" about what you are doing and why you are doing it. Why you are highlighting something, etc

II) Present them with the second empty document.

Instruction
Now, build the summary based on what you highlighted, and what you think would be most important. You can structure it any way you want. Make sure to build it so you would find it most useful for the goals you have indicated(Name them). It can be as long or as short as it can be. You can refer to the highlights and original case notes if needed.

As you write the summary, please try to "think aloud" about what you are writing and why you are writing that.

Post-task Question(2min):
How do you feel about this activity you just completed? Is there anything that you feel could be changed or strengthened further in terms of case note writing?

Final wrap-up (5 min)
Thank you for doing this activity with us. Before we wrap up, we would like to ask some follow-up questions.

- Ask them why they included or didn't include something they mentioned in their previous interviews.
- Why did you choose this particular format for the summary (bullets, paragraphs, etc)? Would you consider a different format?
- Do you think it would be useful to have direct quotes in the summary, or would you prefer a more generalized paragraph form?
- Show them our summary template and ask if they'd incorporate any of that into their design.

That brings us to the end of the session. Thank you so much for your time and effort!
STOP recording

Appendix C: Checkbox Interview Protocols

Stage 1:

1. What do you see as the purpose of checking the checkboxes?
2. How do you determine what checkboxes to assign to each case note?
   a. Did you receive any formal or informal training on how to use the checkboxes and which checkboxes to check?
      i. <if yes> Could you please tell me about that training? Was it useful? Were there other things that might have been useful that were not covered in this training?
      ii. <if no> Do you think any training might have been useful?
   b. When do you check boxes in the complete process of interacting with a client? (Ex: after the client shares their request/update, Before and after meeting the client, While listening to the client, etc)
   c. And why?
3. How easy or difficult do you find the process of checking boxes?
   a. Do you think that you check enough or too few checkboxes?
   b. Why? (if too few)
      i. What prevents you from checking as many as you want? (Ex: Difficult UI, lack of guidance from management, not using them in daily work, etc.)
   c. Do you find that you have enough information to determine the appropriate checkboxes?
      i. If not, how do you get the needed information? How do you make sure that you go back to the original case notes and check the relevant boxes?
      ii. Are there checkboxes that are more ambiguous/subjective?
         1. How do you make the decision in these cases? Are you more likely to check the box or not, and does that decision vary from one question to another?
4. How do you use the checkbox data in your case management if at all?
   a. If the checkboxes were checked accurately, would you see a use for the checkbox data in your daily work?
5. Have you ever received any feedback about your use of checkboxes, or are you evaluated at all based on your checking of the checkboxes?
6. How and how often do the checkbox reports affect DACC's funding/resources?
7. What additional checkboxes should be added in your opinion?
8. What information about checkboxes do you currently share with your coworkers if any?
   a. What information do you wish to share with them?
   b. Is there anything that you want to learn from how others write case notes and/or check checkboxes? Anything that you think you can learn from others' work?

9. What are your views on the best approaches to improve the performance of checking boxes?
10. What do you think can motivate case workers to spend effort on checking boxes?
11. What factors might motivate you to change your use of the checkboxes?
12. (Understanding existing interests) What do you enjoy doing in your day-to-day activities at work?
13. How consistent are checkbox-checking practices across the organization?
14. Who all will be using the case notes? (understand the purpose of case notes)
    f. The notes that case managers used to leave for each other in the old system. (do people write notes for different "audiences"? For example, contact information)

Stage 2 Speed-dating:

Schedule of Events:
15 min Intro
20 min individual session
1 hour group discussion

Hi! Thank you so much for once again taking out time to help us with this project! Today, we will be focusing on improving the whole checkbox data labeling system. We will be discussing various ideas to improve the utility, efficiency, and recording of this data.

In total our team produced 16 ideas to tackle the checkbox labeling. The study is divided into two sessions. A 20 minute individual working session to go through all the 16 ideas and take quick notes. Followed by a one hour discussion evaluating each of the ideas.

**Remember to ask to record the meeting

1:00-1:15: Introduction & Goals of the workshop and introduce task
What do we mean by "checkboxes" or "data labeling"?
- These refer to the dropdowns currently under "Contact Type" or "Interventions," which are made for labeling case notes with predefined categories
- These do not refer to demographic checkboxes made when creating a client's profile for the first time.
- Examples include "Direct Contact," or "Collateral Contact"

Goal: Solicit feedback on methods to improve the outcome checkbox/data labeling systems at DACC case management
Why?

1. "Checkbox" systems should be redesigned to make case managers' work more effective
2. Invisible work done by the case managers can be fully captured and recognized
3. Management can use the data to better allocate resources and get funding
4. Future data analysts and NLP experts can have better labeled data for their analyses and tools

Quickly recap our three main clusters. (Based on our previous discussions we identified 3 main clusters of needs to enable a better checkbox labelling experience)

Major need 1: **Aligning data with organizational goals** *- Need checkbox data to be better used after collection*

Major need 2: **Training and standardization issues** *- Awareness of impact of checking ALL relevant checkboxes and standardized usage by everyone.*

Major need 3: **Streamlining data input and interaction for case managers** *- Usability issues with checking the checkboxes*

1:15-1:35 pm: Individual working time

Let's start the individual working session. We will provide you with a set of slides containing 16 ideas. We will also provide a Google Doc to take notes on for each idea.

For each slide, go through the Idea and note down your thoughts in your note sheet. Spend about a minute per idea. We will remind you at half-time.

Here are the [slides], and the notes sheet for each of you [Share notes sheet for each participant]

Individual Guiding Questions
1. How will this be useful in my daily work?
2. Is there somewhere else this would be more useful?
3. How can I improve this idea?

[Provide a reminder at half time]

1:40 - 2:50: Group Discussion
Now that everyone has seen all the ideas, we will discuss them one at a time (about five minutes per idea) as a group.

Ensure this is recorded.

Group Discussion Questions
1. **Usefulness**
   a. How well does the idea resonate with your needs/needs of others you know in daily work?
2. **Improvements**
   a. Is there anything you would change to improve/refine this idea?
   b. Would you change anything about the scenario of usage?
3. **Challenges/Concerns**
   a. What challenges/concerns do you see in implementing this idea?

2:50 - 3:00: Debrief + Reflect

That brings us to the end of the session.

1. Overall, do you have anything else to share about your thoughts on the labeling system?
2. Which of these ideas stand out to you?
3. Which ideas do you believe will motivate you to check more of the checkboxes, more accurately?
4. Are there any major concerns with any of these ideas?

Thank you so much for the valuable feedback. STOP recording.

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