IMPACT OF MOBILE DOCUMENT UPLOAD

An Analysis of 2022 Michigan SNAP
Application Data

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Capstone Project, 2024

Executive Summary

The Supplemental Nutrition Assistance Program (SNAP) provides essential nutritional support to low-income families, individuals with disabilities, and those on fixed incomes. Operating nationwide, SNAP aims to augment monthly grocery expenses for those facing acute financial strain. Despite reaching a substantial portion of the population, estimates from the U.S. Department of Agriculture (USDA) suggest that only 82 percent of eligible individuals access SNAP benefits. Eligible residents face significant challenges in accessing these essential benefits, including navigating complex eligibility requirements, overcoming communication barriers with benefits agencies, and dealing with complicated application procedures. Recognizing these obstacles, state benefit agencies increasingly seek technological solutions to mitigate some of these challenges.

A review of several case studies highlights the value of technology solutions in the public benefits application process when they emphasize human-centered design, offer multilingual resources, and use diverse communication channels.

In 2022, in collaboration with MI Bridges, Michigan's state benefits application center, Benefits Data Trust (BDT), conducted a targeted outreach campaign to promote SNAP benefit applications among eligible Michigan residents. BDT piloted a tool called Mobile Document Upload (MDU) to help streamline the application process and make it easier for applicants to upload their required documentation. This study evaluates the impact of MDU on SNAP application success rates in Michigan.

This report addresses three primary questions:

1. To what extent does MDU impact applicants' success in applying for and receiving SNAP benefits?

2. Are there demographic differences between applicants who used MDU and those who did not?

3. Are there differences in outcomes between individuals who used MDU and those who just utilized BDT's standard application support?

Findings

Analysis Question 1: To what extent does MDU impact applicants' success in applying for and receiving SNAP benefits?

➢ MDU usage does have an impact on partial approval of benefits but *does not* lead to a greater likelihood of application approval.
➢ Less than half of the applicants who used MDU received benefits.

Are there demographic differences between applicants who used MDU and those who did not?
  - ➢ Applicant race, ethnicity, preferred language, or veteran status did not predict whether an applicant used MDU.
  - ➢ Applicant disability status was a statistically significant predictor of whether an applicant used MDU.

Are there differences in outcomes between individuals who used MDU, those who only utilized BDT's standard application support, and the average Michigan SNAP recipient?
  - ➢ On average, applicants who used MDU received fewer benefits than the mean monthly benefit awarded to Michigan residents.
  - ➢ On average, applicants who used BDT's standard application support without using MDU received fewer benefits than the mean monthly benefit awarded to Michigan residents.
  - ➢ MDU use increases the time it takes for applicants to submit their applications and receive benefits.

Generally, the findings of this study suggest that the MDU tool did not produce the intended outcomes during the 2022 Michigan SNAP application window. Nevertheless, these results provide BDT with invaluable insights into the effectiveness of MDU and opportunities to enhance its functionality for broader implementation in the future.

Recommendations

Based on the literature review and data analysis, recommendations are presented in three distinct categories: recommendations to increase the study's validity, recommendations to evaluate factors that can explain the negative results, and recommendations for improving the MDU tool. Specifically, this report recommends that BDT:

Recommendations to increase the validity of the study and future research
  - Conduct further research and analysis with a larger sample.
  - Initiate future research to understand why MI Bridges denied benefits for individuals who used MDU to upload documents.
  - Implement a data collection process to record all instances where a BOS offers an applied MDU.
  - Conduct a survey to ascertain why eligible applicants opted out of using MDU.

Recommendations to evaluate factors that can explain negative results
  - Consider performing a technical audit to ensure MDU functions as desired.
  - Conduct comprehensive observations of Benefits Outreach Specialists.

Recommendations for ways to improve the MDU tool
  - Expand the availability of MDU and supporting materials to languages beyond English.
  - Explore the use of multiple communication channels between BOSs and applicants who utilize MDU.

Overview

Analysis Goals

In 2022, Benefits Data Trust (BDT) partnered with MI Bridges, Michigan's state-run benefits application center, to conduct a targeted outreach campaign to Michigan (MI) residents eligible for SNAP benefits. The campaign encouraged potentially eligible residents to call BDT's call center for support applying for SNAP. BDT analyzed the 2022 data collected in MI and found that the targeted outreach campaign resulted in statistically significant higher SNAP application submission and enrollment rates. In 2022, BDT piloted a newly created SNAP-specific digital tool called Mobile Document Upload (MDU), that allows SNAP-eligible applicants to upload required documentation to BDT for review using their mobile phone or device, streamlining the application process.

This report focuses on BDT's efforts to support potentially eligible residents with the SNAP application process. Specifically, this study evaluates whether MDU impacts SNAP application success rates in Michigan. This report seeks to answer the following analysis questions:
1. To what extent does MDU impact applicants' success in applying for and receiving SNAP benefits?
2. Are there demographic differences between applicants who used MDU and those who did not?
3. Are there differences in outcomes between individuals who used MDU, those who only used BDT's standard application support, and the average Michigan SNAP recipient?

I begin this report with an overview of the issues facing the public benefit application process. I review existing research and literature on the use of technology to make the process of applying for benefits more efficient for eligible applicants. I then outline BDT's approach to benefit application assistance and describe the digital tool, MDU, offered during the 2022 Michigan SNAP application window. Next, I detail the methodology I used to analyze outcomes for SNAP applicants in Michigan who used MDU, followed by the findings of my analysis. Finally, I outline opportunities for BDT to consider to address the challenges raised by the literature review and the findings based on my analysis of the 2022 Michigan data.

Defining the Problem

The U.S. social safety net consists of various programs aimed at helping people facing economic hardship and need. Most public benefit programs are governed by federal law but regulated and administered by local, tribal, state, and federal agencies.

The Supplemental Nutrition Assistance Program (SNAP) – previously known as "food stamps" – is one of the most robust anti-hunger programs in the country. SNAP provides critical nutritional support to low-paid working families, low-income households, and people with disabilities living on fixed incomes. The goal of the benefit is to supplement the costs of groceries each month for those

in greatest need.[1] SNAP operates in the 50 states, the District of Columbia, Guam, and the Virgin Islands.[2] SNAP enrollment expands as the economy weakens and poverty increases to help households stabilize during temporary periods of crisis or unemployment, like the COVID-19 pandemic.[3]

While eligibility requirements vary across states, in general, households that have a gross monthly income at or below 130 percent of the federal poverty level and a net monthly income at or below 100 percent of the federal poverty level are eligible for the benefit.[4] In fiscal year 2022, 13 percent of Michigan's residents (1.3 million people) and one in eight people in the country (over 41.2 million people) received SNAP benefits.[5] Despite reaching 12 percent of the total U.S. population, the U.S. Department of Agriculture (USDA) estimates only 82 percent of eligible people received SNAP benefits.[6]

Eligible residents face multiple barriers to accessing public assistance programs, making it more difficult to apply for the support they need. Research conducted by BDT demonstrates that some of the primary process-related barriers include complicated eligibility requirements, communication challenges with benefits agencies, and complex application processes.[7] Without a standardized application process across states, applicants must navigate different eligibility criteria, documentation requirements, and application processes depending on where they live. In addition to process-related challenges, cultural barriers exist, including a lack of public awareness about available programs and stigma around needing public assistance. State benefit agencies are increasingly seeking technology solutions to ameliorate these barriers. The following literature review examines how technology can eliminate barriers to accessing social benefits.

[1] "Supplemental Nutrition Assistance Program (SNAP) | Food and Nutrition Service."
[2] "Policy Basics: The Supplemental Nutrition Assistance Program (SNAP)."
[3] "Policy Basics: The Supplemental Nutrition Assistance Program (SNAP)."
[4] Beshay, "What the Data Says About Food Stamps in the U.S."
[5] Hall and Nchako, "A Closer Look at Who Benefits From SNAP: State-by-State Fact Sheets."
[6] United States Department of Agriculture, Cunnyngham, and Mathematica, "ESTIMATES OF STATE SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM PARTICIPATION RATES IN 2018."
[7] "New Research Shows Ways to Reduce Stigma Among Older Adults of Accessing Benefits - Benefits Data Trust."

Literature Review

In what way is technology most valuable to the public benefit application process?

This report assumes that innovations in the digital user experience can help respond to the process and cultural barriers that limit access to public benefits. This literature review identifies where these technology solutions are most beneficial. A review of several case studies demonstrates technology solutions are most valuable in the public benefit application process when they:

Employ **human-centered** design

Offer tools in **multiple languages**

Use **multiple communication channels**

Employing Human-Centered Design

Human-centered design centers the user experience in the development process to ensure the products and services created respond to the needs of the target audience.[8] A human-centered approach puts the users' needs first and adapts to their needs as they change over time, necessitating that digital tools are adaptable. Technology interventions and solutions should also be simple and easy for the target audience to use in the benefits application process.

Many people do not have internet access in their homes but own a smartphone, making them smartphone-dependent. Twenty-seven percent of households earning less than $30,000 per year rely on their smartphone, rather than home broadband service on a tablet, laptop, or desktop computer, to access the internet.[9] In 2019, Code for America conducted a national assessment to evaluate public benefits enrollment across the country. It found that despite evidence showing the need for smartphone-accessible application processes and resources, many public benefit programs lack mobile-friendly sites on which eligible residents could apply.[10] This forces applicants to use websites not designed for smartphone engagement, leading to additional difficulty navigating the site and features that don't work on mobile devices. By limiting the application process to those with access to a desktop computer or laptop, many potentially eligible applicants experience an additional barrier to applying for benefits.

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[8]"What Is Human-Centered Design? | HBS Online."
[9]Pew Research Center, "Mobile Fact Sheet."
[10]Code for America, "Bringing Social Safety Net Benefits Online — Code for America."

Based on core human-centered design principles of simplicity and ease-of-use, technology solutions to the public benefit process should be **mobile-first**, meaning built with the intention of the user accessing the website primarily from their smartphone rather than a desktop computer or laptop.[11]

Additionally, apps, websites, and portals should be **mobile-responsive**, allowing users to access the site from their mobile device without having to worry about screen size and resolution.[12] In 2023, only 52% of benefit programs across the country had mobile-responsive websites available.[13] In many cases where a benefits application tool is not mobile-first or mobile-responsive, the application can be unreadable for users accessing it on their smartphone.[14]

Offering Resources in Multiple Languages

Data released in October 2023 by the U.S. Census Bureau from the American Community Survey suggests roughly five percent of the U.S. population over the age of 18 does not speak English well or at all.[15] Furthermore, income distribution varies by English proficiency. In 2020, National Institute of Health researchers found that limited English proficient (LEP) adults in the United States who responded to a national survey reported being in the Poor income group at a higher rate than English-proficient adults.[16] If a higher rate of LEP individuals lives at or below the poverty line, technology interventions must be responsive to their language access needs to increase equity in application assistance.

In 2021, Project Bread, a Massachusetts-based nonprofit organization providing food assistance to families, researched existing barriers and the role that race and ethnicity play in accessing SNAP benefits. They found that one of the most commonly reported barriers to applying for SNAP amongst BIPOC respondents was the limited options for applying in a language that was not English.[17]

GetCalFresh, California's online SNAP application program run by Code for America, uses Google ads to recruit Californians to sign up for SNAP. Researchers from Cornell, Stanford, Harvard, and Code for America found that the English-language Google ads GetCalFresh deployed disproportionately favored English speakers over Spanish speakers. The researchers found that in all counties across California, Spanish speakers were underrepresented in GetCalFresh enrollee demographics relative to the share of Spanish speakers at or below the poverty line.[18]

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[11]Jooste, "The Missed Opportunity in Online Benefits Applications: Mobile First — Code for America," May 5, 2021.
[12]Parlakkılıç, "Evaluating the Effects of Responsive Design on the Usability of Academic Websites in the Pandemic."
[13]Code for America, "The Benefits Enrollment Field Guide — Code for America."
[14]Jooste, "The Missed Opportunity in Online Benefits Applications: Mobile First — Code for America," May 5, 2021.
[15]U.S. Census Bureau, "Explore Census Data."
[16]Sifuentes et al., "The Role of Limited English Proficiency and Access to Health Insurance and Health Care in the Affordable Care Act Era."
[17]McAleer et al., "Barriers to SNAP."
[18]Koenecke et al., "Popular Support for Balancing Equity and Efficiency in Resource Allocation: A Case Study in Online Advertising to Increase Welfare Program Awareness."

To decrease benefit barriers, technology solutions must be implemented in multiple languages that target the native languages spoken by the potential applicant population.

Using Text-Based Communication Channels

Chat-based services, especially those that offer anonymity, can help applicants experiencing fear or shame about seeking public benefits get the information they need. Chat-based support can also increase accessibility for residents facing barriers to connecting in person or via phone due to language, speech, or ability needs.

In 2020, the Minnesota Department of Human Services and Code for America piloted a digital benefits application for food, cash, and other types of assistance.[19] A key feature of the app was an embedded chat service through which residents could connect with a support person to ask questions about the online application process or benefits eligibility. In addition to offering chat-based support, the state continued its telephone support line so residents could connect with support staff. After implementing this service, the Wilder Foundation found that 54 percent of Minnesota residents preferred live support over chat to help over the phone.[20]

Chat- or text-message-based systems can also reduce the time applications take to complete the submission and review process. In 2018, the Michigan Department of Health and Human Services partnered with Civilla and Code for America to pilot a two-way text messaging program between residents applying for public benefits and caseworkers. After the pilot, they found that the approval rates for benefit applications improved from 53 percent to 67 percent, and the average days needed to determine eligibility dropped from 13 to 10. Overall, they discovered that offering two-way text message communication provides residents and caseworkers with a convenient and flexible communication channel. Additionally, caseworkers were able to intervene more quickly if a resident submitted an incorrect or incomplete document by sending a text message rather than a letter via mail or a voicemail.[21] Offering text-based communication has proven to increase the success of benefit applications and enrollments.

About Benefits Data Trust and Mobile Document Upload

Benefits Data Trust (BDT) invests in developing solutions to eliminate barriers to applying for and receiving public benefits. BDT is a nonprofit that utilizes data, technology, and policy to provide efficient access to public benefits and assistance, improving people's health and financial security. BDT partners with state benefit agencies to modernize the application process for public benefits to increase efficiency and equity. By helping government agencies adopt policy changes and leverage new outreach strategies and technology, BDT has helped streamline access to benefits for millions of people. BDT notes that, as an organization, it submits more benefit applications each year than

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[19]Palmer et al., "Putting People First: Chat Services to Improve Client Feedback Loops."
[20]Palmer et al., "Putting People First: Chat Services to Improve Client Feedback Loops."
[21]Civilla and Code for America, "Streamlining Access to Public Benefits in Michigan."

any other entity in the country. Since 2005, BDT has secured over $10 billion in public benefits and services for households who need it most.[22]

BDT aims to find new ways to increase access to public benefit programs. In addition to using more traditional outreach tools, such as targeted text messages and mailers, to reach eligible community members, the organization is testing more mobile-friendly features that work on smartphones and tablets to increase accessibility and speed up the benefits application process.

BDT predominantly invests in three approaches to increase benefits access: (1) spurring potential and current beneficiaries to take action in applying for or recertifying their eligibility for state-administered benefits; (2) assisting applicants in navigating the benefits application process by operating a benefit call center currently serving six states where trained Benefit Outreach Specialists (BOS) provide one-on-one support; and (3) developing accessible digital tools to support eligible residents with submitting supporting documentation to speed up and increase the efficiency of the application process.

The primary outreach model that BDT deploys includes using data from the state that identifies residents who are enrolled in Medicaid but not in SNAP. BDT conducts targeted outreach to these individuals using mail or text messages to increase awareness about available benefits and application processes. When an individual calls BDT's call center, they are connected to a BOS for assistance. During this interaction, the BOS answers any questions about the benefit application process and completes a standardized screening process to determine whether the individual meets the eligibility requirements for SNAP. The BOS collects information on the individual's income, assets, liabilities, expenses, and household composition. The BOS enters the information gathered into a client management and application tool called PRISM. If the screening tool determines that the individual is likely eligible, the BOS helps them complete the benefit application(s), and BDT submits the application to the state benefit agency on the individual's behalf. Applicants receive a confirmation letter from BDT with the receipt of the application, an outline of the next steps, and a customized list of documents they will need to provide based on the information the BOS collected. Previously, BDT offered a service called Document Assistance to support applicants with this phase of the application process.

Document Assistance

In a no longer active program, BDT provided Document Assistance to residents wanting someone to review their documentation before submitting it to the state benefits agency. For benefit assistance programs like SNAP, applicants must submit various documents to the state agency to verify their eligibility for benefits. The required documents can range from documents that provide proof of identity and age, proof of citizenship and immigration status, proof of residency, proof of income and expenses, depending on the applicant's status. This process can be difficult, tedious, and

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[22]"Benefits Data Trust to Assist State Agencies to Streamline Access to SNAP - Benefits Data Trust."

confusing for applicants, and it can create additional hurdles to receiving benefits if the wrong documents are submitted to the state agency.

BDT's Document Assistance service provided an expert review of applicants' required documentation before submitting it to the state agency, intending to minimize delays caused by submitting incorrect documents. Clients mailed physical documents to the BDT office, where a BOS reviewed the documentation to ensure it met the application requirements and then submitted the application on the resident's behalf.

During the COVID-19 pandemic, BDT ceased offering clients the option to send documents by mail for review. This change in service and the emergent needs brought on by the pandemic highlighted the requirement for a mobile-friendly Document Assistance tool. By replacing the labor-intensive process of mailing and reviewing physical documents with a mobile offering, BDT hoped to increase the efficiency of the benefits application process – connecting more residents to more resources faster.

Mobile Document Upload

In 2022, BDT piloted a comprehensive digital document assistance tool for the SNAP application process. The Mobile Document Upload (MDU) app enabled clients to upload documents digitally from their smartphone or tablet to BDT for review. Clients could use MDU to meet various SNAP eligibility requirements, like proof of identity, residency, income amounts, etc., by attaching supporting documents to their SNAP benefit applications.

BDT built the tool specifically to support the SNAP application process and piloted the MDU tool in Michigan. Today, MDU is only offered to clients in "single-benefit states," where BDT supports one type of benefit application. The application document requirements are less complicated in those states than in ones where BDT assists with screening applicants for eligibility for multiple benefits. These single-benefit states where BDT offers MDU for SNAP applications include Colorado, Michigan, North Carolina, and South Carolina.

The tool provides guidance on what documents the applicant should submit and a checklist to streamline the document retrieval process. Once submitted, the BOS reviews the documents and verifies that the applicant met the requirements (e.g., proof of identity). Once the applicant uploads the required documentation and the BOS reviews and verifies it, the BOS submits the application to the state agency on behalf of the applicant. If, after six weeks, the applicant does not upload all of their documentation, the BOS submits their application anyway to not further delay the process.

Checklist from MDU → **BOS Reviews Documents** → **BDT Submit Application**

MDU Access and Eligibility

BDT designed MDU to replace its physical Document Assistance service. In states where MDU is offered, applicants can no longer mail physical copies of their documents to the BDT office for review. A client can only get help from a BOS reviewing their documents through MDU. An applicant must be provided access to MDU and then choose to use the tool to receive document assistance.

During the initial phone call between a BOS and a resident who received targeted outreach, the BOS determines if the applicant is a good candidate for MDU. If the BOS determines the applicant is a good candidate for MDU, they will grant the applicant access to the tool after the applicant completes two-factor authentication. Approximately ten minutes after the call ends, the applicant receives a text message with an individualized link to access the MDU tool.

The BOS offers MDU to those who meet certain criteria or who would benefit from the tool. The tool is only available to a selection of applicants who meet the following criteria:
- The client's application must require documentation to be submitted.
- The client must accept or opt-in to using the tool.
- The client must have a smartphone or device to take photos, connect to the Internet, and receive text messages.

| Specialist conducts screening of applicant | Specialist offers applicant MDU access | Applicant chooses whether to use MDU |

While the decision to offer someone MDU lies with the BOS, the decision about whether to use MDU rests with the applicant. Potential reasons an applicant might not be offered MDU or choose not to use it include:
- The applicant does not have a mobile phone, so they cannot access the link to the MDU tool.
- The applicant qualifies for a simplified application process that does not require documentation, like the Elderly Simplified Application Project or Combined Application Projects.
- The applicant is eligible for an expedited application process due to dire circumstances. In cases where applicants are eligible for an expedited process, they do not need to submit documentation as part of their application.
- The applicant does not want to delay the application submission process by uploading documentation through MDU.
- The applicant perceives the MDU application as being too difficult to use.

It is difficult to identify all the circumstances that might lead an applicant to either use or opt out of MDU. BDT does not currently track when an applicant is offered MDU unless the applicant opts in to use the tool.

Currently, MDU is only offered in English, which presents significant limitations for those for whom English is not their primary language. For non-English speaking clients, BDT utilizes internal staff who speak the language, if available, or a translation service conducted via phone. Typically, applicants' documents are in English, even if they primarily speak another language. In these cases, BDT can still offer them support with reviewing documents if they choose to use MDU, but they cannot guarantee that communications with the applicant will be in their preferred language.

In an internal trend investigation conducted on calls monitored in single-benefit states where BDT offered MDU between May and June 2023, BDT found that many eligible applicants who opted into MDU experienced technical difficulties using the tool. After receiving access to MDU, 23 percent of clients called the call center back. 64 percent of these callers reported issues with accessing the link to MDU. Reports primarily included not receiving the text message or the link to access MDU not working.

Michigan 2022 SNAP Application

In November 2021, BDT launched a contact center for Michigan residents who needed assistance applying for state-wide benefits. In 2022, BDT conducted targeted mail outreach to individuals who might be eligible for SNAP benefits, using data from MI Bridges, the state-run benefits application center. MI Bridges provided BDT data on MI residents enrolled in Medicaid but not SNAP. The mail outreach campaign targeted these potentially eligible Michigan residents to call the BDT call center to get support from a BOS to see if they are eligible for SNAP benefits.

BDT conducted mail outreach each week to individuals inviting them to engage in direct service through BDT's call center or apply for SNAP benefits directly through MI Bridges. BDT sent up to three text message reminders to the targeted individuals two, four, and six weeks after the initial mail outreach.

After an initial analysis of data from clients who received outreach between February and April 2022, BDT found that the targeted outreach campaign resulted in statistically significantly higher SNAP application submission and enrollment rates than the control group. The submission and enrollment rates were highest for older adults in the group who participated in direct service and highest for younger adults in the group who applied directly through MI Bridges.

This study expands on the initial analysis conducted by BDT in Michigan during a portion of the 2022 SNAP application window. Specifically, this analysis examines the outcomes of MDU use for Michigan residents.

Methodology

Data Collection

The dataset used in this study comes from three sources: (1) the outreach file provided by MI Bridges containing demographic information on the residents enrolled in Medicaid but not SNAP; (2) the enrollment file provided by MI Bridges containing data on who enrolled in SNAP and if the state awarded them benefits; (3) data collected during the screening call in PRISM, BDT's client management and application tool, by the several BOSs. A BDT data scientist created the dataset by combining and cleaning the data to include only relevant variables. When creating the dataset, the data scientist did not impute any missing values or remove incomplete records.

The outreach file provided by MI Bridges contains demographic information on the MI residents enrolled in Medicaid but not SNAP, including race, ethnicity, age, disability status, veteran status, and the primary language spoken and written in the household. The enrollment file provided by MI Bridges contains application information for everyone who submitted a SNAP application, including who received SNAP benefits and the amount received. The data BDT captured by the BOS in PRISM includes data on whether a client opted into MDU, if the client submitted all of their required documentation through the tool, and the types of documents requested.

Who applied for benefits?
From August to December 2022, BDT piloted MDU in Michigan to SNAP applicants. During this time, the BDT call center received 5,160 calls. The BOSs at the BDT call center closed out approximately 40 percent of the calls made between August and December. The BOSs closed cases if the caller was already enrolled in SNAP, inquired about a benefit not offered in Michigan, or did not meet the SNAP eligibility requirements established by the state, *See **Appendix A** for a breakdown of the closeout reasons.*

3,110 individual callers' cases remained open after the initial screening call with a BOS. These callers discussed the SNAP application process with a BOS and received information about how to apply. S*ee **Appendix B** for the demographic breakdown of the 3,110 individual callers.*

Who received benefits?

Of the 3,110 individuals who contacted the BDT call center, approximately 80 percent submitted an application. MI Bridges received 2,513 applications from the sample population. MI Bridges approved, partially approved, or denied each application.[23] Notably, MI Bridges:

➢ Approved under half (45%) of the applications
➢ Denied approximately one-third (36%) of the applications
➢ Partially approved less than one percent (n=6) of the applications[24]
➢ One application was pending and did not have a final determination at the time BDT received the data

The following table, **Table 1,** represents the demographic breakdown of the 2,513 individuals in the sample population who submitted applications during the sample window. Note that the data represents the individual designated as the head of household.

Table 1
Demographic Information of Sample who a Submitted SNAP Application
n=2513

Race	n	%
American Indian	39	1.55
Asian	20	0.80
Asian Indian	2	0.08
Black or African American	716	28.49
Chinese	1	0.04
Filipino	2	0.08
Korean	0	0.00
Native Hawaiian or Pacific Islander	6	0.24
Vietnamese	1	0.04
White	1348	53.64
Other Asian	21	0.84
No information[25]	352	14.01
Ethnicity	**n**	**%**
Hispanic/Latino	157	6.25
Non-Hispanic	1885	75.01
No information[26]	471	18.75
Language spoken	**n**	**%**
Arabic	14	0.56
Bengali	1	0.04
English	2088	83.09
Farsi	1	0.04
Hindi	1	0.04
Kurdish	1	0.04
Russian	1	0.04
Spanish	64	2.55
Swahili	0	0.00
Thai	1	0.04
Vietnamese	1	0.04

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[23] At the time that BDT received the data file from MI Bridges, one application was pending and did not have a final determination.
[24] A "partially approved" SNAP application typically means that some aspects of the application were accepted or approved by the state-administering agency, but some parts of the application were not approved.
[25] No information – includes *Not supplied by source system, Unable to determine race, and Blank*
[26] No information – includes *No supplied by source system, Unknown, Blank*

	n	%
No information	340	13.53
Language written	**n**	**%**
Arabic	17	0.68
English	2290	91.13
Hindi	1	0.04
Polish	1	0.04
Spanish	61	2.43
No information	143	5.69
Disability status	**n**	**%**
Has disability	355	14.13
Does not have disability	2015	80.18
No information	143	5.69
Veteran status	**n**	**%**
Veteran	26	1.03
Not a veteran	2344	93.27
No information	143	5.69
Number of people listed on application	**n**	**%**
One individual	1547	61.56
Two individuals	447	17.79
Three individuals	205	8.16
Four individuals	163	6.49
Five individuals	96	3.82
Six or more individuals	61	2.19

Only 279 (approximately 11%) individuals in the sample opted to use MDU to complete their application. Of the applicants who utilized MDU, MI Bridges approved approximately half (48%) and denied the other half (51%). Comparatively, the approval rate for applicants who did not use MDU was slightly higher (56%).

The following table, **Table 2,** presents the breakdown of the application status of the 2,513 applications MI Bridges received between August and December 2022.

Table 2
Application Approval Status of Sample Population
n=2513

	n	%
Submitted an Application	**n**	**%**
Yes	2513	80.80
No	597	19.20
Used MDU	**n**	**%**
Yes	279	11.10
No	2234	88.90
Application Approval Status – Did not use MDU	**n**	**%**
Approved	1258	56.31
Denied	970	43.42
Partially Approved	5	0.22
Pending	1	0.04
Application Approval Status – Used MDU	**n**	**%**
Approved	135	48.39
Denied	143	51.25
Partially Approved	1	0.36

Notably, most individuals who submitted applications were White, non-Hispanic English speakers.

Data Analysis

My analysis used various statistical tests to understand the relationships between different variables. **Table 3** below details the statistical tests I used on the data. Generally, I used:

- Descriptive statistics, including frequencies for demographic variables;
- Inferential analysis, including independent t-tests, one-sample t-tests, Chi-square tests, and regressions, to reach conclusions that extended beyond the immediate descriptive data; and
- Propensity score matching to establish an artificial control group to assess the causal impact of the tool.

Table 3

Statistical Analysis Tests Used in Data Analysis

Overall Analysis Question	Information Analyzed	Tests Used
Analysis Question 1: To what extent does MDU impact applicants' success in applying for and receiving SNAP benefits?	Comparison of the means of the benefit award amounts between two independent groups – those who used MDU and those who did not.	Independent T-test
	Assessment of the causal impact of MDU on applicants' outcomes.	Propensity score matching, multinomial logistic regression.
Analysis Question 2: Are there demographic differences between applicants who used MDU and those who did not?	Assessment of the relationship between two or more variables to test whether certain variables were predictors for using MDU. Including, race, ethnicity, preferred language spoken/written, disability status, and veteran status.	Chi-square test
Analysis Question 3: Are there differences in outcomes between individuals who used MDU, those who only used BDT's standard application support, and the average Michigan SNAP recipient?	Comparison of the means between a single sample and a known population mean, specifically, the average benefit amount awarded per person as reported by the state. Including: ● The mean benefit award from those who used MDU ● The mean benefit award for all applicants in the sample who applied using BDT support (not just MDU) ● The mean benefit award for applicants who did not use MDU	One-sample T-test
	Compare the means of the average number of days it took to submit an application between two independent groups—those who used MDU and those who did not.	Independent T-test

Propensity Score Matching

In addition to the statistical tests previously mentioned, I used propensity score matching to answer the first analysis question. Propensity score matching (PSM) is part of a class of statistical methods developed for estimating treatments or interventions' effects and conditional casualty with

observational data. In instances where randomized trials are unethical or not practical, propensity score matching provides a process for assessing causal effects when a counterfactual, or estimate of what would have happened without the intervention, must be created.[27]

The dataset required PSM to analyze the nonexperimental, observational data that BDT collected in Michigan throughout 2022. I used this quasi-experimental method to construct an artificial control group and estimate the difference in outcomes between beneficiaries of MDU and non-beneficiaries. Propensity score matching reduces the selection bias that may be present in the screening process conducted by BOS.[28] By using this type of statistical analysis, the treatment groups can be balanced to make them comparable to draw conclusions about the causal impact of the treatment (the use of MDU) on the outcome (successful approval of SNAP benefits). The intervention's impact can be more accurately measured using this estimated probability.

After conducting PSM, I performed multinomial logistic regression on only the matched cases to create a model of the relationship between the predictor variable (use of MDU) and membership in the three groups (application approved, application partially approved, and application denied).

Findings

The following findings correlate to the study's analysis questions. *See **Appendix C** for more information on the results of the analysis and inferential tests run in this study.*

Analysis Question One: *To what extent does MDU impact applicants' success in receiving SNAP benefits?*

➤ **MDU usage does have an impact on partial approval of benefits but *does not* lead to a greater likelihood of application approval.**

After controlling for the potential confounders using PSM, a multinomial logistic regression on the matched cases showed that MDU usage impacts whether the application status resulted in partial approval from MI Bridges. In fact, the high, positive magnitude suggests that MDU usage increases the likelihood that a submitted application will result in only partial approval. The regression yielded statistically significant results ($p<.05$) for *only* partial approval, not full approval or denial.

Of the 2,512 applicants in the sample who submitted an application, less than ten percent opted to use MDU, and only 5.37 percent of the entire sample used MDU and were approved for the full benefit amount.

[27] Guo, Fraser, and Chen, "Propensity Score Analysis: Recent Debate and Discussion."
[28] Kaplan, "Propensity Scores."

➢ **Less than half of the applicants who used MDU received benefits.**

Only 48.39 percent of the applicants who used MDU were approved for the full benefits they were eligible for from MI Bridges, and over half (51.25%) were denied benefits completely. While the sample size was quite small (279 applicants who used MDU), these results indicate that there might be gaps in applicants' understanding of their eligibility or in the screening process conducted by BOS when applicants first call BDT.

48%
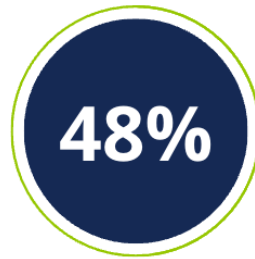
MDU users received benefits

Analysis Question Two: *Are there demographic differences between applicants who used MDU and those who did not?*

➢ **Applicant race, ethnicity, preferred language, or veteran status did not predict whether an applicant used MDU.**

After assessing whether there was a relationship between MDU usage and various demographic characteristics, applicants' race, ethnicity, preferred language to speak, preferred language to write, and veteran status were not statistically significant predictors of whether or not they opted to use MDU.

➢ **Applicant disability status was a statistically significant predictor of whether an applicant used MDU.**

The only demographic characteristic that yielded statistical significance was an applicant's disability status *($\chi^2(1) = 17.0241$, p $<.001$).* Without knowing more about the types of disabilities applicants had, it's difficult to determine why they were more likely to opt to use MDU than applicants who did not have disabilities.

Analysis Question Three: *Are there differences in outcomes between individuals who used MDU, those who only used BDT's standard application support, and the average Michigan SNAP recipient?*

➢ **On average, applicants who used MDU received fewer benefits than the mean monthly benefit awarded to MI residents.**

The USDA Food and Nutrition Service reports that the average monthly benefit per person in Michigan for FY22 was $243.06.[29] By comparison, the average benefit amount received by applicants who used MDU was $118.46 – less than half the average amount awarded per person in the state for FY22. The data shows a statistically significant difference between the average benefit amount awarded to individuals who used MDU and the average amount administered per person in the state of Michigan. Applicants who used MDU received fewer benefits (*M*=11.46, *SD*=141.606) than the average awarded to Michigan residents, *t(143)= -10.559, p<.001. See **Figure 1**.

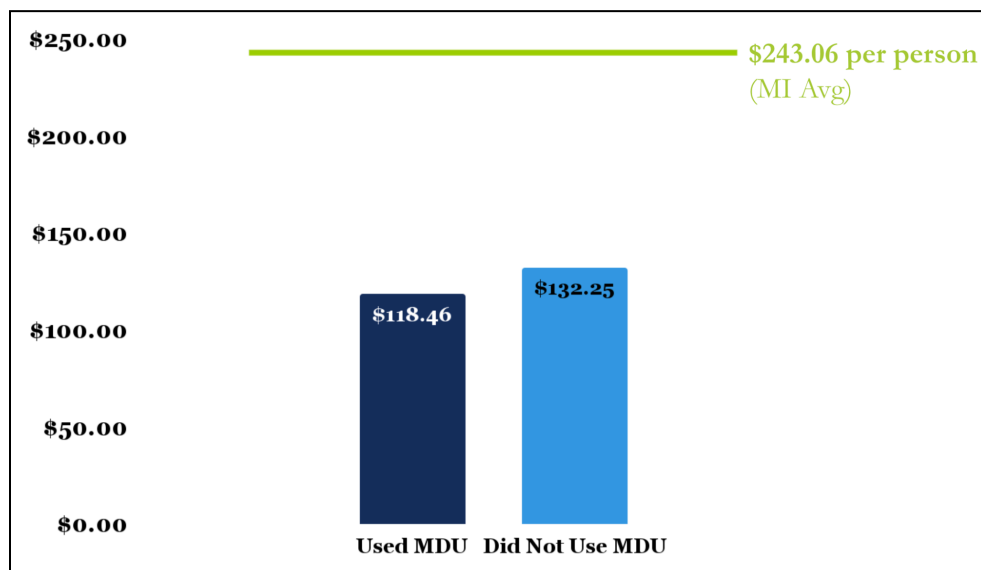*See* **Appendix D** *for the FY22 USDA Data for Michigan SNAP Benefits.*

Figure 1: Comparison of average monthly benefit received by applicants who used MDU, applicants only used BDT's standard application support but not MDU, and the average amount awarded to MI residents for FY22 as reported by the USDA.

➢ **On average, applicants who used BDT's standard application support and did not use MDU received fewer benefits than the mean monthly benefit awarded to MI residents.**

The average benefit amount received by applicants who used BDT's standard application support but not MDU was $132.25. The data shows a statistically significant difference between the two groups. Applicants who used BDT's standard application support but did not use MDU received fewer benefits (*M*=132.25, *SD*=137.733) than the average awarded to Michigan residents, *t(1310)= -29.131, p<.001. See **Figure 1**.

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[29] "SNAP Data Tables | Food and Nutrition Service."

The data analyzed for this study only covered the period from August to December 2022, potentially introducing sampling bias and limiting the generalizability of the findings to the broader population of individuals seeking application support from BDT throughout the entire application window. It's possible that the sample may not adequately represent the demographic diversity and temporal distribution of callers throughout 2022. Moreover, many eligible Michigan residents may have applied for SNAP benefits earlier in the application window or before receiving targeted outreach from BDT, thus bypassing the need to contact the call center altogether.

➢ **MDU use increases the amount of time it takes for applicants to submit their applications and receive benefits.**

There is a statistically significant difference in the mean duration (in number of days) it took for approved applicants who used MDU and those who did not ($p<.05$, $D=.036$), and the effect size, or size of the difference, was very large. The applicants who used MDU had a higher mean by a difference of 26.5 days, meaning that it took significantly longer for them to apply than those who did not use MDU. *See **Figure 2.***
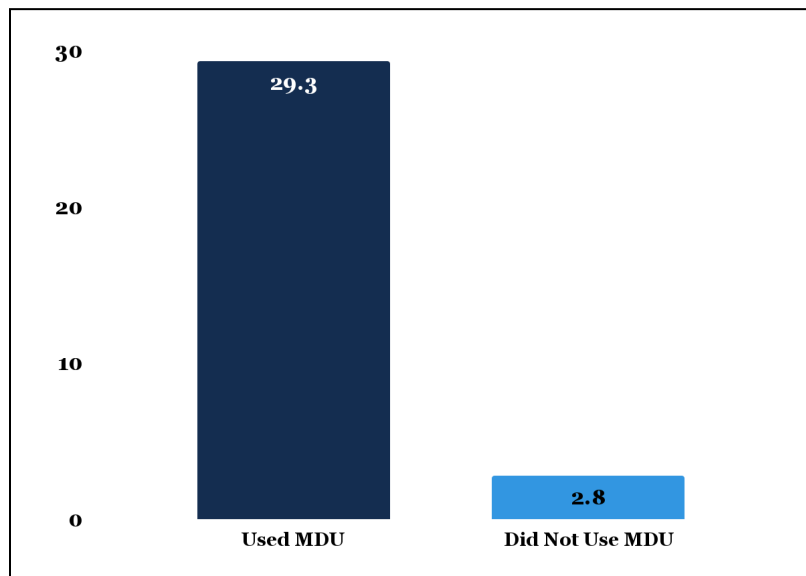

Figure 2*: Comparison of average amount of time, in days, it took to submit their application between applicants who used MDU and those who used only BDT's standard application support.*

Limitations of Data Analysis

Internal Validity – Design

This study has some limitations regarding the internal validity of the study's design.

Potentially Incomplete Dataset

The dataset used for this study relied on integrating data from disparate sources. This introduces the potential for inconsistencies, errors, and missing information, which may undermine the dataset's reliability and completeness. BDT is limited to the information and data MI Bridges shares; it may not always have the contextual information to understand certain aspects of the data shared or inconsistencies in the data.

Secondary Data Analysis

An important consideration in interpreting the findings of this study is the inherent limitations associated with the secondary analysis of existing data. While secondary analysis offers valuable opportunities to explore research questions using pre-existing datasets, it is constrained by the limitations and biases present in the original data collection process. The quality and completeness of the data and the availability of relevant variables are contingent upon the objectives and methods of the primary study. It is possible that data and variables that could have been valuable to analyze were left out of the dataset. The data used for this study was not collected specifically for the purpose of evaluating the effectiveness of MDU, so there may be limitations in terms of the scope and granularity of variables, as well as the ability to control for all relevant factors. BDT should exercise caution in drawing definitive conclusions and acknowledge the inherent limitations of the data.

Internal Validity – Measures

This analysis has some limitations regarding the internal validity of the study's measures. Therefore, stakeholders should be aware of these concerns and pursue additional research to assess the robustness of the findings from this study.

Limitations of Propensity Score Matching: While PSM offers a powerful method to address confounding variables in observational studies, its implementation introduces several possible limitations. The effectiveness of PSM relies on the accurate specification of the propensity score model, which requires the inclusion of all relevant covariates that influence both treatment assignment and outcome. The dataset used in this study may not include all of the relevant covariates, especially given the dataset was constructed from multiple data sources. Failure to adequately account for all confounding factors could result in residual bias, potentially undermining the internal validity of the analysis. Additionally, the assumption of conditional independence may not be true in all circumstances, particularly if unobserved variables or unmeasured confounders exist. PSM cannot address issues of possible unmeasured or unknown confounding factors. While PSM can create a predictive control group resembling what a control group might look like in a

randomized trial, it may not fully capture the real-life randomization process. BDT should remain cautious of the limitations of PSM and consider complementary sensitivity analyses for future research.

Selection Bias – *Applicant self-selection*: Selection bias exists when an intervention cannot be randomly assigned. In this case, applicants who were offered MDU were not randomly assigned access to the tool but had to meet specific eligibility requirements, and they ultimately had to opt in or out of using it. This selection bias may have influenced the composition of the study sample and, consequently, the generalizability of the findings. While propensity score matching can reduce the selection bias in the data, Benefits Outreach Specialists (BOS) are still given the power to determine whether they will offer MDU to applicants, and eligible applicants can decide if they want to utilize the tool. Applicants who opted to use MDU may have differed systematically from non-participants in ways relevant to the outcome (approval of SNAP benefits) that were not identified during PSM, thus compromising the internal validity of the findings. Although this study used advanced statistical analysis to adjust for selection bias, it cannot be entirely eliminated because the data was observational.

Selection Bias – *BOS selection*: While applicants ultimately decided whether or not they wanted to use MDU, not every applicant who called BDT for support received access to the tool. BOSs offered applicants access to the tool if they met certain criteria or felt the applicant would be a good candidate for MDU. BDT does not capture data on who is offered the tool by a BOS, so it is impossible to assess if the BOS consistently offers every eligible applicant the option to use MDU. This selection bias may have influenced the study sample's composition, which could impact these findings' generalizability.

External Validity

This study has some limitations regarding external validity. Therefore, stakeholders should know these concerns before generalizing or applying the results to different settings.

Varying Application and Documentation Requirements: The SNAP application process varies across states, and the documentation requirements are not uniform across the country. This study only analyzed data from Michigan from August to December 2022, so it is difficult to say if the findings could be generalizable to states where the application requirements differ.

Implications of COVID-19
- **Increased need for SNAP benefits:** During the COVID-19 pandemic, the country saw an increase in individuals applying for and receiving SNAP benefits. Approximately 5.8 million more people per month utilized SNAP benefits during FY 2021 alone.[30] It is difficult to conclude whether the findings from this study could be generalizable during a time when fewer people are in drastic need of food assistance.

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[30]"SNAP Participation Varied Across States From 2019 to 2021."

- **COVID-19 Funding for SNAP:** At the beginning of the COVID-19 pandemic, the federal government authorized extra funding for SNAP and food assistance programs. The extra funding increased Michigan SNAP benefit amounts to the maximum allowable amount per eligible group, regardless of income level.[31] Additionally, Congress temporarily raised all benefits by 15%.[32] This study analyzed application and enrollment data that was impacted by the issuance of additional food assistance, so it is difficult to conclude whether the findings could be generalizable today, now that COVID-19 pandemic relief funding is no longer available.

Limited Scope

The study's reliance on data collected solely from August to December 2022 raises internal and external validity concerns. The four-month window may not capture the full spectrum of SNAP applicant experiences throughout the entire application cycle, potentially limiting the study's representativeness and generalizability. This temporal constraint could compromise the study's internal validity by restricting the depth and breadth of data available for analysis. It may hinder its external validity by not adequately reflecting all SNAP applicants' demographic diversity and temporal dynamics. Thus, caution is warranted when extrapolating the findings beyond the specific timeframe examined.

Recommendations

The findings from my literature review suggest that technology solutions are most valuable in the public benefits application process when they employ human-centered design, offer resources and tools in multiple languages, and utilize multiple communication channels between benefits specialists and applicants. The following recommendations take these findings into consideration, as well as the findings from my data analysis. The recommendations are presented in three distinct categories: future research to increase the study's validity, evaluating factors that might explain the findings, and ideas to improve the MDU tool generally.

Increase the validity of the study and future research

Evaluate factors that can explain negative results

Ways to improve the MDU tool

Recommendations to increase the validity of the study and future research

Conduct further research and analysis with a larger sample.

BDT should consider pursuing further research, as the dataset used for this study was notably small, making it difficult to generalize this report's findings on MDU. BDT should examine data spanning

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[31]Michigan Health and Human Services, "Food Assistance Program."
[32]USDA, "SNAP BENEFITS THE COVID-19 PANDEMIC AND BEYOND."

an entire fiscal year rather than just a four-month window. This comprehensive approach will provide a more robust foundation for drawing conclusions and making informed decisions based on the insights generated from the data. By expanding the dataset to encompass a broader timeframe, BDT can enhance the reliability and generalizability of the study's findings, thereby maximizing the utility of the analysis in informing future strategies and initiatives.

Initiate future research to understand why MI Bridges denied benefits for individuals who used MDU to upload documents.

Over half (51.25%) of the applicants who used MDU did not receive benefits from MI Bridges. The dataset used in this study poses limitations in pinpointing the specific factors contributing to benefit denials in this context. If an applicant does not upload all their documentation after six weeks of accessing MDU, a BOS submits their application to the state agency to avoid further delay. Further investigation is warranted to uncover potential underlying factors that were not captured within the scope of this analysis and to explore the relationship between applications submitted by BOSs after six weeks and the outcome from MI Bridges. Results from this research could provide guidance to future applicants using MDU and training for BOSs.

Implement a data collection process to record all instances where a BOS offers an applicant MDU.

BDT does not capture data on every eligible applicant to whom a BOS offers MDU. This study did not examine the share of people offered MDU choosing not to use the tool. If BDT collects data on the number of people offered MDU, it can gain valuable insights into characteristic predictors to better understand who uses MDU when offered.

Conduct a survey to ascertain why eligible applicants opted out of using MDU.

By extending their data collection efforts to include information from applicants offered MDU but opt not to use it, BDT could unveil critical patterns to inform targeted strategies to enhance utilization rates. BDT could use the data collected to address potential barriers and will enable BDT to optimize the effectiveness and accessibility of the MDU service.

Recommendations to evaluate factors that can explain negative results

Consider performing a technical audit to ensure MDU functions as desired.

While this study provided valuable insights into various aspects of the data, the dataset used for analysis lacked specific information regarding the successful receipt of the documents uploaded through MDU by MI Bridges. Investing in a technical audit could offer a deeper understanding of the transmission process, shedding light on potential gaps or inefficiencies. An audit will not only enhance the reliability and integrity of the data, it could also inform strategic improvements to the MDU tool, ensuring seamless document transmission and improving overall efficiency.

Additionally, the dataset used for this study lacked crucial insights regarding the types of devices, browsers, and operating systems utilized by applicants who opted into MDU. This missing data presents an opportunity for further investigation, as a significant relationship may exist between application outcomes and the choice of operating system. Future exploration of operating system use could uncover valuable insights to inform strategic decisions and optimizations within the MDU platform. Understanding users' preferences, trends, and behaviors regarding their operating system usage could enhance user experience, accessibility, and overall system performance. Therefore, it is recommended that BDT prioritizes collecting and analyzing such data to enrich their understanding of MDU usage dynamics and drive continuous improvement efforts.

Conduct comprehensive observations of Benefits Outreach Specialists.
BDT should consider conducting comprehensive observations of their BOSs to evaluate the utilization of the screening tool and the consistent offering of MDU to SNAP-eligible applicants. BDT does not record who BOSs offer MDU to, so it is difficult to determine whether all eligible applicants are being informed of their options to utilize MDU. It is also difficult to assess whether all eligible applicants who used MDU were given the same information about the tool. These observations should carefully assess interactions with individuals who do not speak English to ensure equitable dissemination of information about MDU. These observations will not only enhance the accuracy and fairness of the screening process but also contribute to the improvement of the overall service offered by BOSs.

Recommendations for ways to improve the MDU tool

Expand the availability of MDU and supporting materials to languages beyond English.
Only approximately 4 percent of the sample population spoke a language other than English; however, the sample is not representative of the larger community that applies for SNAP benefits. BDT should consider expanding the availability of the tool in other languages. In the interim, BDT should think about prioritizing providing information about MDU in languages other than English. Offering multilingual resources could foster inclusivity and encourage non-English speakers to utilize the tool if they desire or feel comfortable doing so. Additionally, providing FAQs or technical support services in multiple languages would ensure that non-English speakers who opt to use MDU can still access necessary assistance and support.

Explore the use of multiple communication channels between BOSs and applicants who utilize MDU.
Previous documentation by BDT highlights that numerous applicants encountered technical issues with the tool and required technical support, alongside general inquiries regarding the document

requirements for the SNAP application. BDT should consider implementing a chat-based tech support option to address these challenges effectively. This platform could enable individuals to receive more immediate and real-time assistance while offering flexibility to ask questions and seek support beyond the call center channel. By diversifying communication channels, BDT can enhance accessibility, improve user experience, and better meet the varied needs of applicants navigating the MDU system.

Appendix

Appendix A: Table of Closeout Reasons for Callers

Of the 5,160 total callers who called the BDT-operated call center between August and December 2022, the BOSs closed out 2,050 individual cases after conducting their initial screening. Generally, BOSs closed cases if the caller was already enrolled in SNAP, if they inquired about a benefit that was not offered in Michigan at the time, or if they did not meet the eligibility criteria for the state. Specifically, **Table X,** details the breakdown of closeout reasons for the sample.

Table X
Closeout reasons for callers between August and December 2022
n=2050

Closeout Reason	n	%
Already enrolled	498	24.29
Benefit not offered	3	0.15
Ineligible household member	13	0.63
Ineligible income	1019	49.71
Ineligible income and resources	51	2.49
Ineligible resources	88	4.29
Ineligible student status	15	0.73
Not qualified non citizen	44	2.15
Recently applied	154	7.51
Screened in error	154	7.51

Appendix B: Demographic Breakdown of 3,110 Callers Whose Cases Were Not Closed

The following table represents the demographic breakdown of the 3,110 individual callers whose cases remained open after the initial screening call with a BOS. Data represents the individual designated as the head of household.

Table X
Demographic Information of Sample
n=3110

Race	n	%
American Indian	48	1.54
Asian	26	0.84
Asian Indian	4	0.13
Black or African American	941	30.26
Chinese	2	0.06
Filipino	2	0.06
Korean	0	0.00
Native Hawaiian or Pacific Islander	6	0.19
Vietnamese	2	0.06
White	1611	51.80
Other Asian	25	0.80
No information[33]	435	13.99

[33] No information – includes *Not supplied by source system, Unable to determine race, and Blank.*

Ethnicity	*n*	%
Hispanic/Latino	207	6.66
Non-Hispanic	2326	74.79
No information[34]	577	18.56
Language spoken	*n*	%
Arabic	18	0.58
Bengali	1	0.03
English	2584	83.09
Farsi	1	0.03
Hindi	1	0.03
Kurdish	1	0.03
Russian	1	0.03
Spanish	92	2.96
Swahili	1	0.03
Thai	1	0.03
Vietnamese	2	0.06
No information	407	13.09
Language written	*n*	%
Arabic	21	0.68
English	2808	90.29
Hindi	1	0.03
Polish	1	0.03
Spanish	89	2.86
No information	190	6.11
Disability status	*n*	%
Has disability	409	13.53
Does not have disability	2511	80.74
No information	190	6.11
Veteran status	*n*	%
Veteran	34	1.09
Not a veteran	2886	92.80
No information	190	6.11

[34] No information - includes *No supplied by source system, Unknown, Blank*

Appendix C: Detailed Results from Inferential Analysis Tests

Analysis Question One: To what extent does MDU impact applicants' success in applying for and receiving SNAP benefits?

Question	Variables	Analytic Method	Evidence	Analysis
What is the difference in benefit award amounts between the applicants who successfully submitted an application without MDU and those who successfully submitted an application using MDU?	Continuous outcome	Independent T-test	$p > .05$ therefore, there is **not a statistically significant** difference in the difference in benefit award amounts between the applicants who successfully submitted an application and used MDU and those who successfully submitted an application and did not use MDU. (M1=116.51, SD1=144.263, M2= 131.691, SD2= 136.579), ($p > .05$, D= 0.111)	To examine if there is a difference in the means between award amounts granted to the applicants who used MDU and those who did not, I performed an Independent T-test. The test did not yield significant results. Therefore, we cannot say there is a statistically significant difference in the means between the two groups in this sample. **Applicants who did not use MDU had a higher mean than those who did use MDU (a difference of 15.18).
To what extent does MDU impact applicants' success in receiving SNAP benefits?	Categorical outcome MDU Used // Application Approval Status	Multinomial logistic regression on only matched cases	**Likelihood Ratio Tests:** ● The Chi-Square statistic for the Intercept is 23.586 with 2 degrees of freedom, and the significance value (Sig.) is less than 0.001. This indicates that the Intercept is highly significant in the model. ● For the variable "Mdu used," the Chi-Square statistic is 2.911 with 2 degrees of freedom, and the significance value is 0.233. This suggests that "Mdu used" is not a statistically significant predictor in the model at the conventional alpha levels (such as 0.05 or 0.01). **Parameter Estimates** **When app_status is 1 (approved)**	Exp(B) gives us the multiplicative change in the odds ratio. When MDU is used, the odds of the variable "app_status" being 1 (approved) are halved. The odds of it being 2 (partially approved) are multiplied by 6888545.438 when MDU is used. The coefficient estimate is significant, indicating that MDU usage has a major impact on whether the variable "*app_status*" is 2. The multinomial logistic regression shows that MDU usage has a major impact on whether the application status is partially approved because the results yielded statistical significance and the magnitude of the coefficient was high. The corresponding coefficient for approvals is not statistically significant, so the expected odds of an application being approved are halved by MDU usage.

| | | | • For "Intercept," the estimate (B) is 0.636 with a standard error of 0.412, and the Wald statistic for testing the significance of this coefficient is 2.380 with 1 degree of freedom. The corresponding significance value is 0.123, indicating that the Intercept is not statistically significant at p<.05 level.
• For "Mdu used," the estimate (B) is -0.694 with a standard error of .429.

When app_status is 2 (partially approved)
• The estimate (B) for "Intercept" is -20.708 with a standard error of 1.003, and the Wald statistic for testing the significance of this coefficient is 425.852 with 1 degree of freedom. The corresponding significance value is 0.001, indicating that the Intercept is statistically significant at p<.05 level.
• For "Mdu used," the estimate (B) is 15.745 with a standard error of 0, which is **statistically significant**. | **These results may be affected by the small sample size and the low number of actual partial approvals (n=1) |

Analysis Question 2: Are there demographic differences between applicants who used MDU and those who did not?

Question	Variables	Analytic Method	Evidence	Analysis
Is race a predictor for using MDU?	Categorical outcome Race // MDU Used	Chi-square test	1. American Indian or Alaskan Native (Not a predictor p>.05) 2. Asian (Not a predictor p>.05) 3. Asian Indian (Not a predictor p>.05) 4. Black or African American (Not a predictor p>.05) 5. Native Hawaiian or Other Pacific Islander (Not a predictor p>.05)	To assess whether there is a relationship between MDU usage and applicants' race, I performed a Chi-Square Test of Independence for each category of race. 1. Observed frequencies indicated that four applicants who were American Indian or Alaskan Native used MDU and 0 did not

		6. Chinese (Not a predictor p>.05) 7. Filipino (Not a predictor p>.05) 8. Vietnamese (Not a predictor p>.05) 9. White (Not a predictor p>.05) 10. Other Asian (Not a predictor p>.05) **There was not the minimum expectation of five occurrences in most variables related to ethnicity due to the overall small n. The only Chi-Square tests that met the minimum expectations were White and Black or African American.	(Expected Frequencies: Used MDU=3.7 Did Not Use MDU=0.3). The Chi-Square Test did not yield significant results, implying no significant association between MDU usage and whether an applicant is American Indian or Alaskan Native. Therefore, this variable is not a predictor of MDU usage. $(\chi^2(1) = 378, p = .539)$ 2. Observed frequencies indicated that two applicants who were Asian used MDU and 0 did not (Expected Frequencies: Used MDU=1.8 Did Not Use MDU= 0.2). The Chi-Square test did not yield significant results, which implies there is no statistically significant association between MDU usage and whether an applicant is Asian. Therefore, this variable is not a predictor of MDU usage. $(\chi^2(1) = .188, p = .665)$ 3. No applicants who identify as Asian Indian used MDU. 4. Observed frequencies indicated that 78 applicants who were Black or African American used MDU and 201 did not (Expected Frequencies: Used MDU=75.9 Did Not Use MDU=5). The Chi-Square test did not yield significant results, which implies that there is not a statistically significant association between MDU usage and whether an applicant is Black or African American. Therefore, this variable is not a predictor of MDU usage. $(\chi^2(1) = .914, p = .339)$ 5. Observed frequencies indicated that 1 applicant who was Hawaiian or Other Pacific Islander used MDU and 0 did not (Expected Frequencies: Used MDU=.9 Did Not Use MDU=.1). The Chi-Square test did not yield significant results, which implies that there is not a statistically significant association

				between MDU usage and whether an applicant is Hawaiian or Other Pacific Islander. Therefore, this variable is not a predictor of MDU usage. ($\chi^2(1) = .093$, p = .760) 6. Observed frequencies indicated that 1 applicant who was Chinese used MDU and 0 did not (Expected Frequencies: Used MDU=.9 Did Not Use MDU=.1). The Chi-Square test did not yield significant results, which implies that there is not a statistically significant association between MDU usage and whether an applicant is Chinese. Therefore, this variable is not a predictor of MDU usage. ($\chi^2(1) = .093$, p = .760) 7. No Filipino applicants used MDU. 8. No Vietnamese applicants used MDU. 9. Observed frequencies indicated that 165 applicants who were White used MDU and 17 did not (Expected Frequencies: Used MDU=166.5 Did Not Use MDU=15.5). The Chi-Square test did not yield significant results, which implies that there is no statistically significant association between MDU usage and whether an applicant is White. Therefore, this variable is not a predictor of MDU usage. ($\chi^2(1) = .385$, p = .535) 10. Observed frequencies indicated that three applicants who identified as "Other Asian" used MDU and 0 did not (Expected Frequencies: Used MDU=2.7 Did Not Use MDU = .3). The Chi-Square test did not yield significant results, which implies that there is no statistically significant association between MDU usage and whether an applicant identifies as "Other Asian". Therefore, this variable is not a predictor of MDU usage.

				$(\chi^2(1) = .282, p = .595)$
Is ethnicity a predictor for using MDU?	Categorical outcome Ethnicity // MDU Used	Chi-square test	• Hispanic/Latino (Not a predictor p>.05) • Non-Hispanic (Not a predictor p>.05) **There was no minimum expectation of five occurrences in each variable related to ethnicity due to the overall small n.	I performed a Chi-Square Test of Independence to assess whether there is a relationship between MDU use and applicants' ethnicity. Observed frequencies indicated that 22 Hispanic/Latino applicants utilized MDU and 0 did not (Expected Frequencies: Used MDU= 22, Did Not Use MDU= 1.9). The Chi-Square Test did not yield significant results, which implies there is no statistically significant association between MDU and applicants' ethnicity. Therefore, ethnicity is not a predictor of MDU usage. $(\chi^2(1) = 2.21, p = .137)$ Observed frequencies indicated that 214 non-Hispanic applicants utilized MDU and 20 did not (Expected Frequencies: Used MDU= 214.1, Did Not Use MDU= 20). The Chi-Square Test did not yield significant results, which implies there is no statistically significant association between MDU and applicants' ethnicity. Therefore, ethnicity is not a predictor of MDU usage. $(\chi^2(1) = .001, p = .980)$
Is language spoken a predictor for using MDU?	Categorical outcome Primary language spoken // MDU Used	Chi-square test	• Non-English (Not a predictor p>.05)	Observed frequencies indicated that 15 non-English-speaking applicants utilized MDU and two did not (Expected Frequencies: Used MDU= 15.6, Did Not Use MDU= 2). The Chi-Square Test did not yield significant results, which implies there is no statistically significant association between MDU and applicants' ethnicity. Therefore, if an applicant is non-English-speaking, it is not a predictor of MDU usage. $(\chi^2(1) = .2421, p = .622)$
Is written language a predictor for using MDU?	Categorical outcome	Chi-square test	• Non-English (Not a predictor p>.05)	Observed frequencies indicated that 14 applicants who didn't write in English utilized

	Primary language written // MDU Used			MDU and two did not (Expected Frequencies: Used MDU= 14.6, Did Not Use MDU= 2). The Chi-Square Test did not yield significant results, which implies there is no statistically significant association between MDU and whether an applicant writes in English. Therefore, whether an applicant writes in English does not predict MDU usage. ($\chi^2(1)$ = .3421, p = .559)
Is disability status a predictor for using MDU?	Categorical outcome Disability status // MDU Used	Chi-square test	• Disability status (Is a predictor p<.05)	Observed frequencies indicated that 40 applicants with disabilities utilized MDU and 12 did not (Expected Frequencies: Used MDU= 47.6, Did Not Use MDU= 4.4). The Chi-Square Test yielded significant results, implying **a statistically significant association** between MDU and whether the applicant has a disability. Therefore, disability status is a predictor of MDU usage. ($\chi^2(1)$ = 17.0241, p <.001)
Is veteran status a predictor for using MDU?	Categorical outcome Veteran status // MDU Used	Chi-square test	• Veteran status (Not a predictor p>.05)	Observed frequencies indicated that one veteran applicant utilized MDU and 0 did not (Expected Frequencies: Used MDU= .9, Did Not Use MDU= 0). The Chi-Square Test did not yield significant results, which implies there is not a statistically significant association between MDU and if someone is a veteran. Therefore, veteran status is not a predictor of MDU usage. ($\chi^2(1)$ = .093, p = .760)

Analysis Question 3: Are there differences in outcomes between individuals who used MDU, those who only used BDT's standard application support, and the average Michigan SNAP recipient?

Question	Variables Increased award amount // Successful completion MDU vs. non-MDU	Analytic Method	Evidence	Analysis
Are applicants awarded a higher amount of SNAP benefits than the average for the state when they apply with BDT support?	Continuous outcome	One-sample T-test	MI avg per month $243.06 p<.001 Therefore, there **is a statistically significant** difference in the mean benefit award for applicants who apply with BDT support and the mean monthly benefit awarded to MI residents (as reported by MI).	I used a One-sample T-test to compare the means between the average benefit amount awarded to applicants who apply with any type of BDT support and the average reported by the state. The test yielded statistically significant results, so a significant difference exists between the average benefit awarded to applicants who apply using BDT support and the average awarded to MI residents. The average benefit award amount for applicants who apply with BDT is $130.88 as opposed to the mean reported by the state at $243.06 per month (95% CI [-119.28,-105.07]).
Are applicants awarded a higher amount of SNAP benefits than the average for the state when they use MDU?	Continuous outcome	One-sample T-Test	p<.001 Therefore, there **is a statistically significant** difference in the mean benefit award for applicants who apply with MDU, the mean monthly benefit awarded to MI residents (as reported by MI).	I used a One-sample T-test to compare the means between the average benefit amount awarded to applicants who apply using MDU and the average reported by the state. The test yielded statistically significant results, so a significant difference exists between the average benefit awarded to applicants who apply with MDU and the average awarded to MI residents. The average benefit award amount for applicants who applied and used MDU was $118.46 as opposed to the mean reported by the state at $243.06 per month (95% CI [-147.93, -101.28])
Are applicants awarded a higher amount of SNAP benefits than the average for the state when they	Continuous outcome	One-sample T-Test	p<.001 Therefore, there **is a statistically significant** difference in the mean benefit award for applicants who apply	I used a One-sample T-test to compare the means between the average benefit amount awarded to applicants who apply with BDT

			with BDT support but **do not use MDU** and the mean monthly benefit awarded to MI residents (as reported by MI).	support but do not use MDU and the average reported by the state. The test yielded statistically significant results, so a significant difference exists between the average benefit awarded to applicants who apply using BDT support but not MDU and the average awarded to MI residents.
apply with BDT support but don't use MDU?				
				The average benefit award amount for applicants who apply with BDT support and do not use MDU is $132.25 as opposed to the mean reported by the state at $243.06 per month (95% CI [-118.27,-103.35])
What is the difference in the average time taken to submit an application for SNAP between applicants who used MDU and those who did not? (not filtering out people who were partially approved or denied)	Continuous outcome	Independent T-test	p<.001 Therefore, there **is a statistically significant** difference in the mean number of days between an applicant's initial call with BDT and their application submission for people who used MDU and people who did not. (M1=3.13, SD1=8.987, M2= 34.77, SD2= 24.341), (p<.05)	To examine if there is a difference in the mean number of days it took applicants in the sample to apply from when they first called BDT between those who applied using MDU and those who did not, I performed an Independent T-test. The test yielded significant results. Therefore, we can say there is a statistically significant difference in the means between the two groups in this sample. **The applicants who did use MDU had a higher mean than those who did not use MDU (a difference of 31.64 days)
What is the difference in the average time taken to submit an application for SNAP between applicants who were approved for benefits and those who were denied? (not filtering out by MDU usage) (not including partially approved applicants)	Continuous outcome	Independent T-test	p<.001 therefore, there **is a statistically significant** difference in the mean number of days between applicants who were approved for benefits and those who were denied. (M1=5.37, SD1=13.464, M2=8.22, SD2=17.312), (p<.001, D=-.186)	To examine if there is a difference in the mean number of days it took applicants who were approved for benefits and those who were denied, I performed an Independent T-test. The test yielded significant results. Therefore, we can say there is a statistically significant difference in the means between the two groups in this sample. The effect size, or size of the difference, is very small. **The applicants who were denied benefits had a higher mean (a difference of 2.85 days)
What is the difference in the	Continuous outcome	Independent T-test	p>.05 therefore, there is **not a**	To examine if there is a difference in the mean

average time to submit an application for SNAP between applicants who used MDU and were approved for benefits and those not approved for benefits? (filtering out people who were partially approved)			**statistically significant** difference in the average number of days between applicants who used MDU and were approved vs those who used MDU and were denied. (M1=29.33, SD1=26.047, M2=39.76, SD2=21.525), (p>.05, D=-4.38)	number of days it took applicants who used MDU and were approved for benefits and those who used MDU and were denied benefits, I performed an Independent T-test. The test did not yield significant results, therefore, there is not a statistically significant difference in the means between the two groups in this sample. The effect size, or size of the difference, is very small. **The applicants who were denied benefits had a higher mean (a difference of 10.43 days)
What is the difference in the average time taken to submit an application for SNAP between applicants who used MDU and those who did not? (filtering only those who were approved for the full amount of benefits they applied for)	Continuous outcome	Independent T-test	p<.001 Therefore, there **is a statistically significant** difference in the mean number of days between an applicant's initial call with BDT and their application submission for people who used MDU and people who did not. (M1=2.80, SD1=7.758, M2= 29.33, SD2= 26.047), (p<.001, D=-2.425)	To examine if there is a difference in the mean number of days it took applicants in the sample who were approved for benefits from when they first called BDT between those who applied using MDU and those who did not, I performed an Independent T-test. The test yielded significant results, therefore we can say there is a statistically significant difference in the means between the two groups in this sample. **The applicants who did use MDU had a higher mean than those who did not use MDU (a difference of 26.53 days)
What is the difference between the average number of documents requested between those whose applications were approved using MDU and those who were denied?	Continuous outcome	Independent T-test	p>.05 therefore, there **is not a statistically significant** difference in the average number of documents requested between the applicants who used MDU and were approved and the applicants who used MDU and were denied benefits. (M1=12.80, SD1=11.598, M2=12.31, SD2=14.881), (p>.05, D=.036)	To examine if there is a difference in the mean number of documents requested between those whose applications were approved using MDU and those who were denied, I performed an Independent T-test. The test did not yield significant results. Therefore, we can say there is a statistically significant difference in the means between the two groups in this sample. The effect size, or size of the difference, is very small. **The applicants who were approved had a slightly higher mean than those who were not approved for benefits (a difference of 0.49 documents)

Appendix D: FY2022 USDA Data for Michigan SNAP Benefits

The following table was pulled from the USDA *National and/or State Level Monthly and/or Annual Data* tables on the USDA SNAP website. Specifically, the table shows the average benefit amount awarded to Michigan residents in FY22.

Fiscal Year and Month	Participation 1/		Cost	Cost Per	
	Household	Persons		*Household*	*Persons*
Michigan					
Oct 2021	720,095	1,332,844	315,761,675	438.5	236.91
Nov 2021	708,692	1,329,643	322,935,233	455.68	242.87
Dec 2021	709,182	1,329,628	321,259,381	453	241.62
Jan 2022	711,124	1,335,123	327,257,729	460.2	245.11
Feb 2022	712,516	1,345,633	328,182,258	460.6	243.89
Mar 2022	721,705	1,360,482	330,675,947	458.19	243.06
Apr 2022	715,768	1,348,861	329,158,167	459.87	244.03
May 2022	717,095	1,350,305	331,151,606	461.8	245.24
Jun 2022	718,328	1,353,650	331,961,590	462.13	245.23
Jul 2022	741,237	1,387,346	332,742,731	448.9	239.84
Aug 2022	733,005	1,376,870	336,897,975	459.61	244.68
Sep 2022	728,887	1,365,336	333,449,719	457.48	244.23
Total	**719,803**	**1,351,310**	**3,941,434,011**	**456.31**	**243.06**

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