pulse

IMPLEMENTATION ROADMAP

Prepared For :

Centraide du Grand Montreal

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EXECUTIVE SUMMARY

Pulse represents a transformative shift for Centraide and its network of over 350 community agencies, moving from fragmented, retrospective reporting to a unified, real-time intelligence ecosystem. Currently, the network operates in data silos, relying on inconsistent manual processes that delay insights and hinder the strategic allocation of resources. Pulse addresses this by establishing a centralized platform designed to harmonize data collection, ensure Bill 25 privacy compliance, and connect vulnerable populations with available resources instantly.

The Solution: A Human-First, AI-Augmented Architecture Pulse is built on a "Human-in-the-Loop" philosophy, utilizing advanced AWS cloud infrastructure and Generative AI to eliminate administrative friction without replacing human connection. The technical strategy rests on three pillars:

Frictionless Ingestion

Recognizing the diverse digital maturity of agencies, Pulse accepts data in any format—voice memos, photos of paper logs, or direct API integrations. AI tools (like Amazon Transcribe and Textract) automatically standardize this input into a cohesive dataset.

The Compassionate Concierge

A multilingual, voice-enabled interface powered by Retrieval Augmented Generation (RAG). It acts as a real-time dispatcher, allowing social workers to instantly locate available services (e.g., shelter beds, food supplies) and empowering beneficiaries to access support via natural conversation.

Privacy by Design

Automated PII redaction ensures that sensitive personal data is stripped before storage, ensuring strict adherence to Quebec's regulatory framework.

To ensure adoption, the rollout follows a five-phase strategy grounded in Rosabeth Moss Kanter's Change Wheel, moving from governance and pilot programs to a network-wide launch. This approach prioritizes the cultivation of internal "champions" to mitigate resistance. By automating the "heavy lifting" of data management, Pulse transforms Centraide into a proactive, evidence-based network. The result is a triple-bottom-line impact: economic efficiency through streamlined operations, environmental sustainability via optimized compute usage, and significantly improved societal outcomes by ensuring help reaches those who need it, when they need it.

PROBLEM STATEMENT

Lack of Integrated Channel

Centraide and its 350+ community agencies work without a shared system for reporting local needs and activities. Each organization uses its own tools and methods, which leads to inconsistent data and makes it difficult to get a clear, up-to-date picture of what is happening on the ground.

Because agencies report to Centraide only occasionally—and often months after projects end—information arrives late, in different formats, and cannot easily be compared. Without a channel that enables agencies to share their status and activities more regularly, Centraide cannot track emerging needs, coordinate responses, or allocate resources effectively.

Compliance with Bill 25 adds another layer of complexity, as any new reporting channel must meet strict privacy and data-management requirements. This makes it even more important to design a centralized, secure system that supports frequent, consistent, and legally compliant data sharing.

Restricted Access to Timely and Actionable Resources

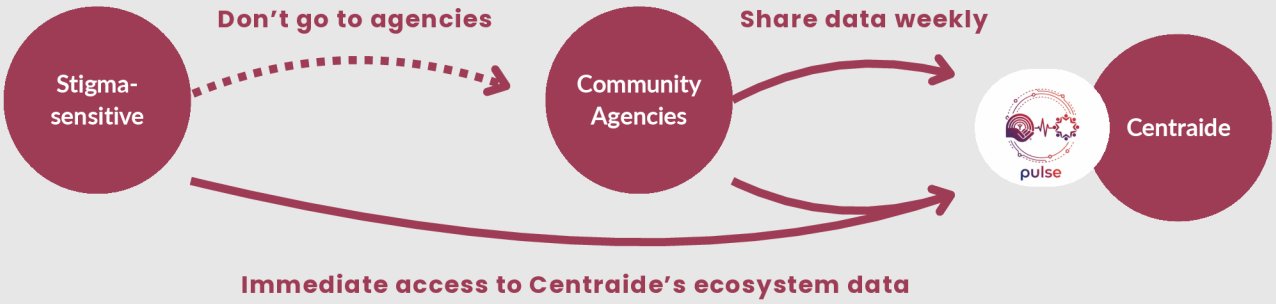
Community organizations across Greater Montreal work with Centraide to deliver essential services, but many people still struggle to access reliable information. Those without phones or internet must visit community centers in person, and even then, service availability isn't shown in real time. Frontline workers often need to manually confirm what resources are available, slowing down service and increasing wait times. Even online, there is no centralized place to see all resources at once.

Resource availability also varies from one agency to another. A center offering food assistance may not provide employment support, and when services aren't available, people are often redirected elsewhere without clear guidance. Without a real-time, centralized system, neither social workers nor community members can easily identify where the right support exists, leading to missed opportunities and inefficient referrals.

This fragmented setup makes it harder for agencies to coordinate and for people to get timely help. A centralized, accessible platform with real-time information is essential to improve coordination, reduce service gaps, and ensure equitable support across Centraide's network.

GOALS & OUTCOMES

To address these challenges, our project proposes the development of a unified platform that connects all participating organizations in real time, as well as the vulnerable populations they serve.



Within the platform, social workers can document information about marginalized communities in a standardized and user-friendly format that adheres to all relevant data privacy requirements. By providing real-time visibility into available resources, the system enables social workers to act as an effective liaison for individuals who lack internet access, improving the overall alignment between service supply and community needs. At the same time, individuals who require community support but may feel hesitant to visit a center in person gain direct access to up-to-date service information.

Success metrics may include the average turnaround time for agency reporting after service delivery. Qualitatively, the platform is expected to broaden the range and diversity of available services and strengthen inter-agency collaboration through greater transparency and shared data.

Anticipated benefits

Short-Term

Improve access to services for those who need them, reducing social exclusion

Long-Term

Provide insights to identify areas for improvement and support strategic, evidence-based planning.

DATA SOURCES

Designing a centralized data system for Centraide is more than a technical exercise—it is a transformative opportunity to connect insights, organizations, and communities in a way that has never been done before in Greater Montreal. To build a platform capable of identifying needs, measuring impact, and matching vulnerable populations with the right resources, we must first understand the diverse landscape of data Centraide relies on and assess the feasibility of integrating these sources into a unified and scalable system.

Agency-Provided Data

The more than 350 community organizations Centraide support each collecting data using different tools, templates, and reporting practices.

- Service usage information (client counts, frequency of visits, demographics)
- Program outputs and outcomes (housing stability, food security indicators, youth tutoring)
- Operational data (capacity, staffing, open/closed status, service availability)
- Annual reports, financial reports, case notes, and crisis-specific updates

This diversity in data provided is not a barrier—it is the reason why a flexible, multi-path data ingestion system is essential.

Public and Government Datasets

- Statistics Canada socioeconomic variables (low income, newcomers, seniors living alone, visible minority status)
- Municipal and borough datasets tied to housing, mobility, safety, and population change
- 211 and 311 helpline referral and service directory data
- School boards and public health agencies, where partnership agreements permit

These datasets anchor agency-level observations in real demographic, geographic, and systemic context. They ensure that analysis not only reflects service demand, but also the underlying structural vulnerabilities of neighborhoods.

Centraide Internal Data

Centraide already manages a wealth of high-value internal information:

- **Funding and investment histories**
- **Monitoring indicators from initiatives like the "Radar" during COVID-19**
- **Equity-based territorial analyses**

FEASIBILITY

Ensuring broad agency participation, key to Centraide, requires a system that is inherently adaptable. **Pulse** is designed around the principle that participation should never depend on an agency's technical maturity or reporting sophistication. Instead of enforcing new workflows or rigid formats, the feasibility of Pulse lies in its ability to meet organizations where they already are.

Adaptive Input Support

Pulse supports a spectrum of real-world reporting behaviors — from fully structured digital reports, to mixed-format submissions, to agencies that currently do not collect data at all. By allowing inputs to arrive in any format, whether that is text, voice, images, PDFs, or existing spreadsheets, Pulse removes barriers to entry and avoids the disruption typically associated with data modernization initiatives.

A flexible ingestion layer interprets and aligns these diverse inputs, standardizing them into a unified, privacy-protected schema. This ensures that agencies with mature reporting practices can continue uninterrupted, while those with less structured processes can participate without additional burden.

Because the platform draws from both internal Centraide systems and external public datasets, Pulse continuously enriches the shared knowledge base with up-to-date community indicators. The result is a technically feasible system that supports lightweight adoption, universal accessibility, and long-term scalability, all while preserving the simplicity of the user experience.

Shared Architecture

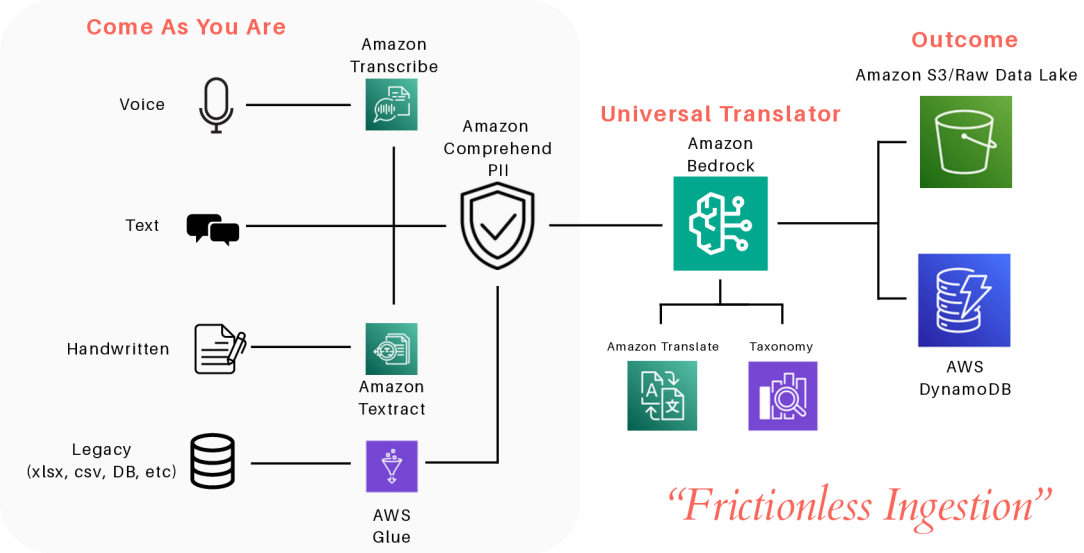
All inputs, regardless of their format or maturity, flow into the same shared architectural backbone. At the foundation is a raw data lake, which preserves every submission in its original, unaltered form. Above it sits a transformation layer responsible for cleaning, mapping, and quality scoring, ensuring consistent structure without erasing the nuances of each agency's context. This feeds a centralized data warehouse that powers dashboards, impact monitoring, and Pulse's real-time resource-matching capabilities. Surrounding the entire system is a governance framework aligned with Bill 25, guaranteeing privacy, consent management, and ethical use of sensitive data. The architecture is intentionally modular and scalable, allowing the system to grow as agencies strengthen their digital capacity and as Centraide's needs evolve over time.

AI/ML APPROACH

Our strategy is built on a core conviction: in social intervention, the human connection is irreplaceable. We do not use AI to automate empathy, but to eliminate the administrative friction that distracts from it. By employing a "Human-in-the-Loop" architecture, we automate the heavy lifting of data standardization and translation. This transforms Centraide from a retrospective funding body into a real-time intelligent support network, allowing caseworkers to focus on people while the AI handles the paperwork.

Pillar 1: Frictionless Data Ingestion (For Organizations)

The Strategy: A "Come as You Are" data model. We solve the burden of fragmented reporting by using Generative AI to treat every input method—Voice, Text, or Paper—as a valid data source. This requires zero workflow changes from agencies.



1. Multimodal Input Streams

Voice Memos:
Using Amazon Transcribe, a worker can record a 30-second summary during a chaotic event. The system transcribes audio and extracts metrics, identifying the speaker automatically and handling accents such as Quebec French with ease.

Smart Chatbot (Text):
Workers can text natural updates (e.g., "Distributed 50 meals, need bread"). Amazon Bedrock parses this unstructured text into structured JSON fields automatically.

Document Scanning:
Amazon Textract (OCR) alongside Computer Vision Models digitize uploaded PDFs or photos of handwritten sign-in sheets, allowing agencies to keep using paper if they prefer.

Existing Digital Systems (API/Integration):

- For agencies that already use CRMs (like Salesforce) or have their own SQL databases, we provide "Digital Connectors."
- Tech: We use AWS Glue. It automatically connects to their system, extracts the relevant data (e.g., inventory counts), and transforms it to match Centraide's format
- Privacy: Just like the other inputs, AWS Glue detects and drops columns containing PII (like names/addresses) before the data leaves the agency's "pipe," ensuring only anonymized metrics reach the central lake.

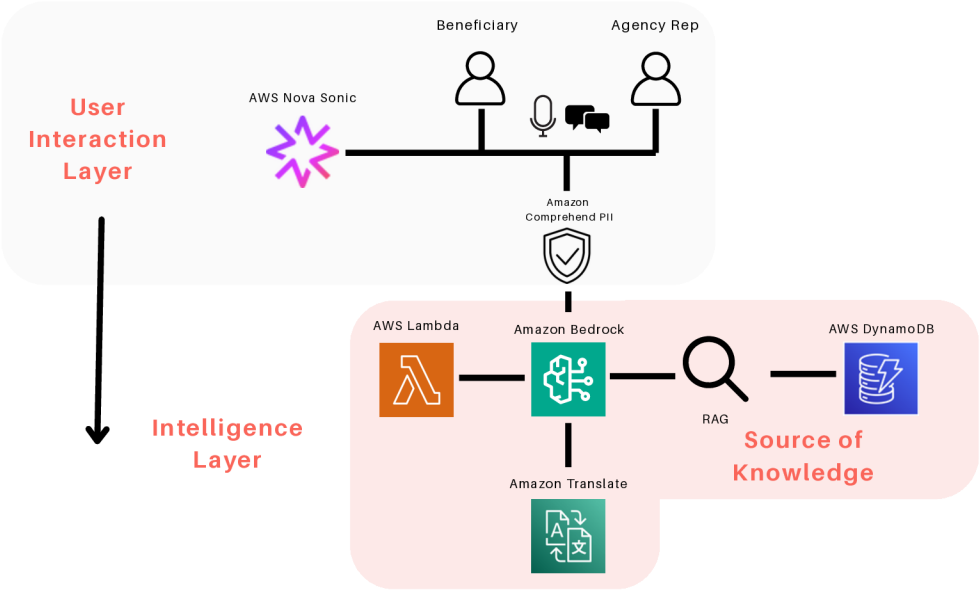
2. The "Universal Translator" (Schema Harmonization)

This is the core innovation for Centraide. Agency A calls their beneficiaries "Clients," Agency B calls them "Participants," and Agency C calls them "Attendees."

- Semantic Mapping: We use Amazon Bedrock (Claude 3.5 Sonnet) as 'the Brain' to semantically map these diverse terms to Centraide's central standard.
- Confidence Scoring: If the AI is >90% confident, it maps automatically; otherwise, it flags for human review, turning hours of manual entry into minutes of verification.
- Scalability: AWS Lambda acts as the serverless glue, scaling automatically whether 1 or 350 agencies report simultaneously.

Pillar 2: The "Compassionate Concierge" (For Beneficiaries & Agency Workers)

The Strategy: We democratize access to information. This tool serves two masters: it removes barriers for vulnerable populations (literacy, language, tech) and acts as a "Super-Dispatcher" for agency workers, giving them real-time visibility into the entire network's inventory to coordinate care efficiently. We achieve this by replacing complex interfaces with a Hybrid Conversational Agent that supports both Voice and Text powered by RAG (Retrieval Augmented Generation).



1. Unified Multilingual Interface

- For Agency Workers: Instead of calling five different shelters to find a bed, a caseworker simply asks the app: "Who has capacity for a family of four right now?" The AI provides an instant, verified answer, eliminating delays in crisis moments.
- For Beneficiaries:
  - Voice Mode (Amazon Nova Sonic): A state-of-the-art Speech-to-Speech model handles listening and speaking in a single loop with ultra-low latency. This allows users to speak naturally (e.g., "I need a winter coat") and receive empathetic, human-like audio responses without literacy barriers.
  - Text Mode (Chatbot): A discreet chatbot option for public spaces
- Translation: Amazon Translate provides real-time support for 75+ languages, ensuring language is never a barrier to aid.

2. Real-Time RAG (Retrieval Augmented Generation)

- Strict Boundary: To prevent hallucination, the AI searches only within the trusted database created in Pillar 1.
- Network Awareness: Because agencies report data in real-time, the system acts as a live "Control Tower." It knows if a food bank just ran out of stock or if a warming center just opened, preventing wasted trips for families and wasted phone calls for social workers.

Pillar 3: Privacy & Ethical Guardrails (Bill 25 Compliance)

Given the sensitivity of the data (homelessness, financial status, location), privacy is not an afterthought; it is the foundation of architecture.

Automated PII Redaction

Using Amazon Comprehend PII, before any voice note, text message, or document is stored in the central database, it passes through a "Privacy Filter." This automatically detects and redacts names, social insurance numbers, and specific

Data Sovereignty

All data processing and storage occurs strictly within the AWS Canada (Central) Region to ensure data never leaves Canadian soil, complying with federal and provincial data residency laws.

PLAN

Implementing **Pulse** is about much more than putting new technology in place. It requires helping Centraide and more than 350 community agencies shift the way they work together, share information, and respond to community needs. For this change to take hold, people need to understand it, feel included, and see real value in it. That's why our plan is grounded in Rosabeth Moss Kanter's Change Wheel — a practical framework that reminds us that successful transformation depends on many moving parts working together: a clear vision, strong champions, supportive governance, open communication, useful training, and small early wins that build confidence.

Our approach unfolds in five phases, each linked to different "spokes" of the Change Wheel. These spokes ensure we balance the technical side of building Pulse with the human side — supporting people through the transition, addressing concerns early, and building a culture that embraces the change rather than resists it.

1

Before anything else, people across Centraide and partner agencies need to understand why Pulse matters and what it will make possible. This phase focuses on building that shared understanding. We begin by creating a simple, concrete vision of what Pulse will do — for example, giving everyone access to the same real-time picture of needs, or reducing the time agencies spend on paperwork. Clear symbols and early prototypes help make the change feel real rather than abstract. At the same time, Centraide sets up a Data Governance Committee with agency leaders, staff, and privacy experts. This group helps define how data should be collected, protected, and shared. Creating this structure early helps reduce uncertainty and gives people a sense of control, which Kanter identifies as critical for reducing resistance. The goal is to **start the journey with clarity, transparency, and trust.**

2

Rather than launching Pulse everywhere at once, we start with a small group of charities who are excited to try new approaches. These early adopters — **our "Pulse Champions"** — help test the system, give honest feedback, and show others what's possible. Their enthusiasm and credibility make a real difference: when frontline workers see peers succeed with Pulse, adoption feels safer and more realistic.

During the pilot, we focus on quick, meaningful wins: cleaner data, easier reporting, fewer manual tasks. These early signs of progress help counter the fears that often come with new technology — concerns about competence, workload, or "another tool to learn." Regular check-ins, shared learnings, and a visible feedback loop keep the pilot grounded in real experiences, not assumptions.

3

With the basics working smoothly, this phase brings Pulse's most helpful features to life — things like voice-note transcription, photo-to-text scanning, and smarter data mapping. These tools are designed to take pressure off frontline workers, not create more work for them. To make sure people feel confident using these features, we pair every rollout with short, practical training sessions and built-in help. Progress is monitored through simple metrics so we can quickly understand what is working and where more support is needed. The goal is to introduce AI in a way that feels empowering and intuitive, **reinforcing the idea that Pulse is here to make work easier, not replace human judgment.**

4

Once Pulse has proven its value, we **expand it across the entire network**. Scaling this kind of change is as much about people as it is about systems. Agency champions from the pilot play an essential role here, sharing tips, answering questions, and offering reassurance. Their voice and experience carry weight — often more than formal training materials. To support a smooth rollout, we align reporting timelines and expectations, provide clear onboarding pathways, and keep communication consistent and proactive. Stories, spotlights, and real examples of Pulse in action help build momentum. Recognizing early adopters and agency leaders who help others along the way reinforces the behaviors that make the transformation successful.

5

When the beneficiary-facing version of Pulse goes live, it becomes a visible symbol of Centraide's broader transformation. The launch is paired with outreach events, demonstrations, and simple guidance so individuals and families can access support in the way that feels most natural to them — whether through voice, text, or multilingual assistance. After launch, we continue refining the platform based on real usage and feedback. This includes **quarterly updates**, additional training for agency staff, and opportunities for agencies to propose improvements or local innovations. Sustaining the change means **keeping the conversation going, celebrating progress, and maintaining the structures that make Pulse reliable and trusted**.

RISK & MITIGATION

Change Management

Pulse's adoption relies on strong change management, particularly by developing internal champions within funded organizations. Following Kanter's Wheel of Change, the strategy focuses on empowering individuals who can promote the tool's benefits and support their peers through the transition. These champions will connect Centraide's vision to daily practice, helping ensure Pulse is viewed as a collaborative tool. Embedding change agents in each organization will reduce resistance and accelerate adoption through peer-led training and continuous feedback.

Bill 25 Compliance

Pulse may occasionally collect limited personal information, but Amazon Comprehend PII ensures full compliance with Québec's Loi 25. It automatically identifies and redacts sensitive data, converting it into anonymized insights before securely deleting the originals. This prevents any retention of individual-level information while supporting accurate reporting. By automating PII handling, Pulse simplifies compliance and reduces administrative workload, allowing organizations to stay focused on service delivery.

Political Resistance

Some organizations may view Pulse as extra paperwork rather than a strategic asset. Centraide must frame it as a win-win tool: frequent, high-quality data directly strengthens an organization's visibility and case for funding. When agencies see how real-time insights help Centraide advocate for resources and demonstrate impact, Pulse becomes a support rather than a burden. Clear communication about the link between data quality and funding opportunities will help build trust and buy-in.

Preserving Humanity

Pulse is designed to support—not replace—human work. By automating reporting and visualization, it frees frontline staff to spend more time with the people they serve. Each interaction is captured without interrupting the human connection at the heart of community work. Rather than depersonalizing services, Pulse strengthens them by ensuring resources reach where they are most needed while keeping the human stories behind the data central to Centraide's mission.

SUSTAINABLE IMPACT

Pulse takes into account the three pillars of sustainable impact, making it a viable solution and a fit with Centraide's values.

Environmental

Pulse is designed to harness the power of AI while minimizing its environmental footprint. To achieve this, AI models will be executed on a weekly basis rather than daily, striking an optimal balance between operational efficiency and energy conservation. This approach ensures that automation benefits are realized without unnecessary resource consumption, aligning with Centraide's commitment to sustainability and responsible technology use.

Societal

Pulse enhances the collection and analysis of data related to social initiatives and vulnerable populations, enabling real-time tracking of needs and outcomes. By streamlining data processes, the tool accelerates organizational workflows, allowing teams to concentrate on core initiatives and optimize resource allocation. Ultimately, this leads to more effective interventions and greater support for those in need, amplifying the societal impact of Centraide's network.

Economical

By providing Centraide with clearer visibility into the actions and results of funded organizations, Pulse enables more accurate and compelling reporting. Improved transparency and demonstrated impact are expected to attract increased funding and donation opportunities, strengthening Centraide's capacity to drive meaningful change in the community.