



# Care Connect AI:

## An AI-Powered, Integrated Health and Social Security Ecosystem for Scotland

### Executive Summary

Scotland faces interlocking crises in public health and poverty that threaten its future prosperity. An NHS under unprecedented structural strain, coupled with the widest health inequalities in Western Europe, has created a cycle of escalating demand and reactive crisis management.

The current siloed delivery of health and social security services is unsustainable, failing to address the root causes of poor outcomes. This report proposes a transformative vision: the creation of a citizen-centric, AI-powered integrated ecosystem for health and social security.

This represents a paradigm shift from treating symptoms towards proactive care, preventative support, and personalised intervention. By ethically harnessing data, Scotland can dismantle service barriers and respond to the holistic needs of its people.

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# 1. Operationalising the "No Wrong Door" Strategy for a Digital Nation

The ambition of the Scottish Government to establish Scotland as a leading Digital Nation is predicated not merely on the digitisation of existing analogue processes, but on the fundamental transformation of how citizens interact with the state.

"Care Connect AI" represents a flagship initiative within this strategic framework, designed to deploy a sovereign, AI-driven conversational agent that serves as a universal, 24/7 entry point for health and social care support.

This proposal outlines the comprehensive project plan for the development, validation, and national rollout of Care Connect AI, leveraging the proven "CivTech" innovation model and the established data infrastructure of "ALISS" (A Local Information System for Scotland).

## 1.1 The Strategic Imperative: Bridging the Gap

The modern landscape of public services in Scotland is characterised by a paradox: while there is a wealth of support available across statutory bodies, the third sector, and community groups, the pathway to accessing this support is often fragmented and opaque.

The "No Wrong Door" strategy, a policy thread running through the Scottish Government's approach to mental health, community justice, and child poverty, asserts that a citizen's entry point into the system should not determine the quality of support they receive. Whether a citizen presents with a housing crisis, a mental health concern, or financial distress, the system must be capable of routing them to the appropriate holistic support without bureaucratic friction.

However, operationalising "No Wrong Door" relies heavily on the tacit knowledge of frontline staff—link workers, GP receptionists, and social workers—whose capacity is finite and whose knowledge of the ever-changing service landscape cannot be encyclopedic.

Care Connect AI addresses this bottleneck by introducing an "Agentic AI" capability. Unlike static directories or simple decision-tree chatbots, an agentic system can reason, understand complex natural language narratives, and proactively navigate the "knowledge graph" of Scottish services to act as a "Loneliness Companion" and a service broker.

## 1.2 The "Loneliness Epidemic" and Digital Companionship

A unique and critical dimension of the Care Connect AI proposition is its dual function as both an informational tool and a companion. Post-pandemic analysis has highlighted a "loneliness epidemic" as a significant determinant of public health, rivaling smoking and obesity in its impact on mortality. Traditional digital services are transactional; they provide a phone number or a web

link. Care Connect AI aims to be relational.

By utilising Large Language Models (LLMs) tuned for empathy and active listening, the system can provide immediate "digital containment" for distressed users, offering a non-judgmental conversational partner available at 3 a.m., whilst simultaneously guiding them toward sustainable human connections found in the ALISS database, such as walking groups or befriending cafés.

## 1.3 Technological Sovereignty and Safety

The deployment of Generative AI in the public sector carries inherent risks regarding data privacy, hallucination (the generation of false information), and clinical safety.

This project proposal is grounded in a rigorous adherence to NHS Scotland's compliance frameworks. The architecture is designed as a "Sovereign AI" solution, hosted within the NHS National Services Scotland (NSS) Azure tenant, ensuring that sensitive citizen data never leaves the UK jurisdiction. Furthermore, the project commits to full compliance with DCB0129 (Clinical Risk Management: its Application in the Manufacture of Health IT Systems), recognizing that bad advice from an AI can cause harm.

## 1.4 The Delivery Vehicle: CivTech

To mitigate the risks associated with procuring novel, cutting-edge technology, Care Connect AI will be delivered through the CivTech accelerator programme. This pre-commercial procurement model allows the Scottish Government to define the "Challenge"—how to use AI to reduce loneliness and improve service access—and engage with agile technology providers to co-create a solution through a structured "Exploration" and "Accelerator" phase.

This ensures that the final product is not just a technical success but is co-designed with the "Quadruple Helix" of government, academia (DHI), industry, and citizens.

## 1.5 Summary of Objectives

The primary objectives of the Care Connect AI project are:

- **Universal Access:** To provide a "No Wrong Door" digital interface that requires no prior knowledge of service bureaucracy, accessible via text and voice.
- **Data Integration:** To dynamically ingest and semanticise the ALISS database, turning static records into a conversable knowledge base.
- **Clinical Assurance:** To achieve a validated Clinical Safety Case Report (CSCR) compliant with DCB0129, enabling safe deployment within the NHS ecosystem.
- **Sovereign Capability:** To build an AI asset owned and controlled by the Scottish public sector, free from vendor lock-in regarding the underlying data models.

## 2. Policy Landscape and User Needs Analysis

The justification for Care Connect AI is rooted deeply in the evolving policy landscape of the Scottish Government, which seeks to harmonise digital innovation with social justice. This section explores the specific policy drivers and the user needs that the system must satisfy.

### 2.1 The "No Wrong Door" Policy Ecosystem

The "No Wrong Door" concept is not a single policy but a systemic philosophy adopted across multiple directorates.

In the context of the National Strategy for Community Justice, it mandates that individuals interacting with the justice system—often some of the most vulnerable citizens—must be seamlessly connected to health, housing, and addiction services. Similarly, the Glasgow Child Poverty Pathfinder utilises "No Wrong Door" to ensure that a family presenting at a food bank is automatically screened for financial entitlement and housing support.

Current implementations of these networks rely on "referral density"—the number of connections human workers can make. However, humans suffer from "referral fatigue" and information overload.

A digital agent does not. Care Connect AI acts as the "connective tissue" for these policies. It ensures that the "No Wrong Door" promise is kept even when human services are closed.

For instance, if a user engages the AI regarding a tenancy dispute, the system's reasoning engine can identify potential downstream risks such as food insecurity or mental health decline and proactively offer support from the ALISS database, thereby fulfilling the holistic intent of the Mental Health & Wellbeing Strategy.

### 2.2 Addressing Digital Exclusion and Accessibility

A critical risk for any "Digital Nation" project is the exacerbation of the digital divide. The Digital Scotland Service Manual emphasizes that services must be accessible to all, including those with low digital literacy or disabilities.

Standard web directories like ALISS require a user to formulate a search query (e.g., "cognitive behavioural therapy in Fife"). This assumes a level of literacy and articulacy that many vulnerable users may not possess.

Care Connect AI shifts the interaction model from "Search" to "Dialogue." A user need only type or say, "I'm feeling overwhelmed and can't pay my bills."

The AI parses this natural language, maps "overwhelmed" to mental health support and "can't pay bills" to financial advice, and retrieves relevant services. By integrating voice-to-text

capabilities—similar to the prototype work done by TL Tech with ALISS—the system becomes accessible to those who struggle with typing or reading, democratising access to information.

## 2.3 The Loneliness Epidemic and Mental Health

The Royal College of Psychiatrists in Scotland has called for "parity of esteem" between physical and mental health. Loneliness is a precursor to many acute mental health conditions.

The proposition to use Care Connect AI as a "Loneliness Companion" is a direct response to this. The system is not intended to replace human therapists but to provide "scaffolding" for the user.

It offers a safe, anonymous space to express distress. The "Agentic" nature of the AI allows it to function as a bridge; after building rapport, it can gently suggest, "There is a men's shed meeting in your area tomorrow at 10 am. Would you like the details?" This "warm handoff" from digital companion to physical community is the core mechanism for reducing social isolation.

## 2.4 User Personas and Journey Mapping

To ensure the solution meets real-world needs, the project will focus on three primary user personas, validated through the Digital Health & Care Innovation Centre (DHI) participatory design process:

Persona	Characteristics	Pain Points	Care Connect AI Solution
"Crisis Colin"	45, unemployed, history of addiction. Urgent needs across housing and health.	"I don't know who to call. I get passed from pillar to post."	Immediate triage. AI recognizes crisis keywords, bypasses general chat, and connects to emergency services or "No Wrong Door" hubs.
"Isolated Irene"	78, living alone, limited mobility. Digitally hesitant.	"I'm lonely but I don't want to bother the doctor."	Voice-activated interface. AI offers conversation, validates feelings, and suggests local transport-accessible coffee mornings via ALISS.

"Overwhelmed Sarah"	28, single parent, financial stress. Time-poor.	"I can't spend hours searching websites. I need help now."	Quick, consolidated answers. AI aggregates info on food banks, benefits, and childcare into a single summary, saving hours of browsing.
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## 3. Technical Architecture and Data Strategy

The technical foundation of Care Connect AI must be robust, scalable, and secure. It will be built upon a Retrieval-Augmented Generation (RAG) architecture, hosted within the NHS Scotland Azure Tenant. This approach allows the system to combine the linguistic fluency of Generative AI with the factual accuracy of the ALISS database, ensuring "Sovereign AI" control.

### 3.1 The RAG Architecture Pattern

Standard Large Language Models (LLMs) like GPT-4 are pre-trained on vast internet data but lack knowledge of specific, real-time Scottish services. They are also prone to "hallucination"—inventing facts. To mitigate this, Care Connect AI will utilize a RAG pattern.

1. User Input: The citizen asks a question (e.g., "Where can I get help with debt in Dundee?").
2. Orchestration & Safety Layer: The input is intercepted by an orchestration agent (e.g., Azure AI Agent Service). It is checked against safety guardrails (Azure Content Safety) to ensure no abusive or harmful content is processed.
3. Retrieval (The Knowledge Graph):
  - The system does not ask the LLM directly.
  - Instead, it queries a Vector Database (Azure AI Search) where the ALISS data is stored.
  - It retrieves the top 5-10 most relevant ALISS service records based on semantic similarity (matching "debt" to "financial advice" or "money support").
4. Augmentation: The system constructs a strict prompt: "You are a helpful assistant. Answer the user's question using ONLY the following verified Scottish service records. Do not invent information."
5. Generation: The LLM generates a natural language response citing the specific ALISS

services, including opening times and contact details.

## 3.2 Data Integration: The ALISS API

The "brain" of the system relies on the "body" of data provided by ALISS. The integration will utilize the ALISS V4 API.

- **Ingestion Strategy:** A scheduled ingestion pipeline (Azure Data Factory) will pull data from the GET /services/ endpoint nightly.
- **Data Structure:** The AI must parse the complex ALISS JSON schema:
  - **id:** Unique identifier for the service.
  - **name & description:** Used for vector embedding to enable semantic search.
  - **locations:** Critical for geospatial filtering (e.g., "near me").
  - **categories:** Used for high-level filtering (e.g., "Health", "Housing").
  - **last\_updated:** A critical metadata field. The AI will be programmed to warn users if a record hasn't been updated in over 6 months, managing expectations about service viability.
- **Real-Time Validation:** In addition to the nightly sync, the AI agent will perform a "Just-in-Time" API call (GET /services/{id}) when a user selects a specific service, ensuring that the details (e.g., "Closed today") are accurate to the minute.

## 3.3 The "Agentic" Shift

The project moves beyond a simple "Q&A" bot to an Agentic Workflow. This means the AI has permission to perform multi-step reasoning.

- **Complex Query Handling:** If a user says "I need a food bank and someone to talk to," the Agent splits this into two sub-tasks: (1) Search ALISS for "Food Banks" in the user's postcode, and (2) Search ALISS for "Befriending" or "Mental Health Support." It then synthesises both results into a single, coherent response.
- **Clarification Loop:** If the search returns too many results, the Agent is empowered to ask clarifying questions: "I found 20 services. Are you looking for drop-in centres or telephone support?"

## 3.4 Sovereign Cloud and Security

Data sovereignty is a non-negotiable requirement for the Scottish Government. The solution will be deployed in the UK South or UK West Azure regions.

- **Private Networking:** All communication between the web frontend and the Azure OpenAI backend will occur over Azure Private Link, ensuring traffic never traverses the public internet.
- **Zero-Training Policy:** The contract with Microsoft (via the NHS Enterprise Agreement) ensures that no citizen data input into the chatbot is used to retrain the foundation



models (e.g., GPT-4).

- Identity Management: While citizen access is anonymous/pseudonymous, administrative access for system management will be secured via NHSmail (Azure AD) Multi-Factor Authentication (MFA).

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## 4. Clinical Safety and Risk Management

The deployment of AI in a health and care context introduces specific risks. If Care Connect AI provides incorrect medical advice or fails to recognise a suicide risk, the consequences could be fatal. Therefore, the project will strictly adhere to the DCB0129 clinical safety standard.

### 4.1 DCB0129 Compliance: The Manufacturer's Duty

Although Care Connect AI is primarily an information signposting tool, it falls under the definition of a "Health IT System" because its output influences patient/citizen care decisions.

- Clinical Safety Officer (CSO): The project must appoint a qualified clinician (Nurse, Doctor, or AHP) with current registration and safety training to act as the CSO. The CSO is responsible for approving the safety case.
- Hazard Workshop: A multi-disciplinary team (engineers, clinicians, users) will conduct hazard workshops to identify potential failures (e.g., "AI hallucinates a crisis hotline number").
- Clinical Safety Case Report (CSCR): A living document that details all identified hazards, the mitigation strategies (e.g., "Hard-coded override for emergency keywords"), and the residual risk level. This document must be approved before the system can go live.

### 4.2 Hazard Analysis and Mitigation Strategy

The following table outlines indicative hazards and their technical/process mitigations:

Hazard ID	Hazard Description	Clinical Impact	Mitigation Strategy
H-001	Failure to Detect Crisis	User expresses intent of self-harm; AI treats it as a general query.	Delay in emergency care; potential fatality.
H-002	Hallucination of Service	AI invents a service that does not exist.	User distress; wasted travel; loss of trust.

H-003	Outdated ALISS Data	AI recommends a service that has closed down.	User travels to closed location; frustration.
H-004	Bias/Inappropriate Tone	AI uses complex language or dismissive tone with vulnerable user.	User disengages; exacerbation of isolation.

### 4.3 Human-in-the-Loop Governance

While the AI operates autonomously, safety requires human oversight. A "Human-in-the-Loop" protocol will be established where a random sample of 1-5% of anonymised conversations are reviewed monthly by the CSO and the product team. This audit process ensures that "Model Drift"—where the AI's behaviour changes over time due to updates—is detected and corrected early.

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## 5. Delivery Model: The CivTech Innovation Path

To deliver a project of this complexity and novelty, it is proposed to utilise the CivTech accelerator programme. CivTech is specifically designed to solve public sector problems through open innovation, allowing the government to procure a solution that does not yet exist in the market.