

RAG-based Chatbot for Domestic Abuse Support in Ireland

Project Proposal



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Chapter 1

Introduction

1.1 Topic and Purpose

Domestic abuse represents a profound and widespread public health and social justice crisis in the Republic of Ireland. Although often hidden, it affects families and communities. National data reveals an alarming and increasing emergency, highlighting the urgent need for innovative, accessible, and safe support mechanisms [1, 2, 3, 4]. For an individual experiencing abuse, seeking help is a complicated combination of psychological, social, and structural barriers, including fear, shame, and lack of knowledge of available services [5, 6, 7].

This project tackles this problem by proposing the design and specification of a specialised conversational agent (chatbot) for domestic abuse support. The purpose of this tool is not to replace human services, but to act as a vital, supplementary first point of contact. It is designed to offer immediate, anonymous, and accessible support, directly reducing many of the discouragements that prevent people from seeking help [5].

1.2 Motivation

The research area for this project lies at the intersection of Human-Computer Interaction (HCI), Artificial Intelligence (AI), and social support systems, specifically focusing on technology for vulnerable populations. The motivation is twofold: the escalating scale of domestic abuse in Ireland and the potential of emerging AI technologies to provide a novel form of support.

Recent statistics highlight the project’s importance. In 2023, Women’s Aid documented its highest-ever level of contact, with a staggering 74% rise in reported physical violence and an 87% increase in economic abuse compared to the previous year [2] and agencies like Tusla are under immense pressure, with child protection referrals having doubled since 2014 [8, 9]. This overwhelming demand strains the existing support ecosystem, creating a critical implementation gap between protective legislation and the lived reality of survivors [10, 11].

Existing research supports the use of chatbots in sensitive contexts, as they offer a non-judgmental space for disclosure and can provide immediate, practical information [5, 12]. However, a significant “gap” in existing research and practice is the safe and ethical application of Large Language Models (LLMs) in such a high-stakes domain. Standard LLMs are prone to “hallucination”, generating plausible but factually incorrect information, which could have life-threatening consequences for a domestic abuse survivor [13, 14, 15].

This project addresses this gap by proposing a Retrieval-Augmented Generation (RAG) architecture. RAG mitigates the risk of hallucination by grounding every response in a curated, verifiable knowledge base of Irish-specific legal and support information [13]. This makes the chatbot’s advice traceable and factually accurate, representing a crucial step forward from generic LLM applications.

1.3 Research Questions

To achieve the project’s aim, the research will be guided by the following key questions:

- What are the core informational, practical, and emotional needs of domestic abuse survivors in Ireland, and how can these be mapped to the functionalities of a RAG-based chatbot?
- How can empathetic conversations be translated into a specific chatbot persona, dialogue flows, and interaction patterns suitable for this vulnerable user group?
- What is the optimal architecture for a RAG pipeline that ensures factual accuracy, safety, and localisation by drawing from a curated knowledge base of Irish legal, NGO, and support service data?
- What ethical protocols, including data privacy, user safety features, and pathways for escalation to human services, are necessary for the responsible deployment of such a chatbot in the Irish context?

1.4 Structure of the Proposal

This document is structured as follows. Chapter 2 provides a comprehensive background analysis. Chapter 3 explains related work in conversational AI. Chapter 4 details the proposed methodology for the project, outlining the phased approach to building the knowledge base, designing the RAG system, and establishing evaluation and safety protocols.

Chapter 2

Background

A comprehensive understanding of the domestic abuse landscape in Ireland is essential for designing an effective and relevant intervention. This requires a multi-faceted analysis encompassing the statistical prevalence of abuse, the legal and institutional frameworks designed to address it, and the critical role of the third-sector organisations providing frontline support.

2.1 Statistical Overview and Demographics

Domestic abuse is a deeply gendered crime in Ireland, with women being disproportionately affected. As established, 35% of women in Ireland have experienced some form of intimate partner violence [1]. Data from police records in 2022 show that women constituted 78% of all domestic violence victims and 88% of intimate partner violence victims [16]. The abuse disclosed to services like Women’s Aid spans a spectrum of harm, including emotional, physical, economic, and sexual violence, with recent data indicating a concerning surge in the rates of physical and economic abuse [2].

However, it is crucial to recognise that men are also victims of domestic abuse.

2.2 The Legal and Institutional Framework

In 2023, Men’s Aid Ireland handled 8,682 contacts, with men reporting patterns of emotional abuse, physical violence, and force control that mirror the experiences of female survivors [3, 17]. A significant challenge in understanding the true scale of male experiences of abuse is under-reporting, driven by social shame, embarrassment, and a fear of not being believed [3, 5].

Furthermore, vulnerability to domestic abuse is not uniform across the population. Certain groups face unique risks and barriers. Older adults are an increasingly recognised group of victims, with reported crimes against those aged 60 and over showing a significant increase in recent years [18].

2.2 The Legal and Institutional Framework

Ireland’s state response to domestic abuse is based on a framework of legislation and legal agencies. The most important part of Irish law in this area is the *Domestic Violence Act 2018* [19]. This landmark legislation significantly updated the legal landscape, most notably by creating the specific criminal offence of **coercive control**. This offence recognises the pattern of non-physical behaviours, such as intimidation, isolation, and psychological manipulation, that abusers use to use power over a victim, acknowledging that abuse is often a sustained campaign of control rather than a series of isolated incidents [20]. The Act also provides for several types of civil court orders designed to protect victims, including **Safety Orders**, **Protection Orders**, and **Barring Orders**, which can prohibit an abuser from committing further violence and, in some cases, exclude them from the family home [21, 22, 23].

Several key state agencies are tasked with implementing this framework. **An Garda Síochána** are the primary first responders. They are responsible for investigating domestic abuse as a crime, responding to emergency calls (receiving

over 65,000 in 2024), and assisting victims in seeking legal protection [4]. **Tusla, the Child and Family Agency**, plays a critical role in cases where children are involved. Domestic abuse is a significant factor in a high percentage of child welfare referrals, and Tusla is responsible for assessing risk and ensuring the protection and welfare of children in these households [24, 25]. The agency has seen a dramatic increase in referrals, receiving almost 92,000 in 2023, double the number since its establishment in 2014, placing its services under immense pressure [9, 8]. Finally, the **Legal Aid Board** provides legal advice and representation to eligible individuals seeking court orders, although accessing these services can present its own challenges for survivors [26].

2.3 The Third Sector Services

The legal framework is complemented by an essential third sector of non-governmental organisations (NGOs) that provide the majority of direct, specialised support to survivors. At a national level, organisations like **Safe Ireland** focus on policy development, advocacy, and coordinating a network of local services [27, 10], while **Women’s Aid** operates the 24/7 National Freephone Helpline, providing immediate crisis support, information, and emotional validation to thousands of women each year [2]. Specialist services such as **Men’s Aid** offer tailored support for male victims, addressing their unique needs and the specific barriers they face [28].

At the local level, these national efforts are translated into direct services. This project proposes a pilot focus on County Galway, making **COPE Galway** a key stakeholder and case study. COPE Galway provides a comprehensive suite of domestic abuse services, centered around its modern refuge, **Modh Eile** [29] where women and their children (up to age 18) can live with privacy and dignity.

2.3 The Third Sector Services

Beyond accommodation, the service offers a 24/7 confidential helpline, additional support where agents meet survivors in the community and advocacy. A crucial component is the dedicated children’s service, **Solas Óg**, which provides treatment, therapy, and peer groups for children and young people who have witnessed or experienced abuse [29, 24].

Although Ireland has a developing legal framework and a network of dedicated support services, there is a significant “implementation gap” between the intention of the policy and the lived reality of survivors. The sheer volume of demand, evidenced by the record-breaking contact numbers for Women’s Aid and the overwhelming referral rates to Tusla, consistently exceeds the capacity of the system [2, 8]. This leads to staff burnout in support services, long waiting times for counselling, and a critical shortage of refuge accommodation that falls far short of the Council of Europe’s recommendation of one family space per 10,000 population [30, 11]. Survivors often find the legal system difficult to navigate, despite the availability of legal aid and protective orders [26]. This gap between the promise of protection and the practical difficulty of accessing it is a critical area where a digital tool can intervene. By providing clear, step-by-step guidance on legal rights, court procedures, and how to effectively engage with agencies like Tusla and the Legal Aid Board, the proposed chatbot can empower users. It can equip them with the knowledge and confidence needed to navigate these complex systems, helping to bridge the gap between the state’s protective intent and the survivor’s lived experience.

Chapter 3

Related Work

To design a truly helpful tool, it is important to go beyond institutional frameworks and search for the subjective experience of the survivor. This involves understanding their multifaceted needs and the powerful role that peer narratives (testimony) can play. Furthermore, it requires a review of existing work in the design of conversational agents for support and the technological foundations that can ensure safety and accuracy.

3.1 The Survivor’s Needs

The needs of a person experiencing domestic abuse are complex and can be broadly categorised into three interconnected domains: informational, practical, and emotional [5].

- **Informational Needs:** A primary need is for clear, reliable information, often beginning with the fundamental step of **recognising the abuse**. Survivors need access to information that helps them identify the signs and patterns of abusive behaviour. They also require knowledge of their legal rights and available community resources.

3.2 Designing Conversational Agents for Human Support

- **Practical Needs:** These are closely tied to informational needs. The most urgent is **safety planning**. This is followed by challenges such as securing safe housing, accessing financial assistance, and navigating social welfare applications [31].
- **Emotional Needs:** Survivors require **empathy and non-judgmental listening** [32]. A core function of support is to provide **validation**, to reassure the survivor that the abuse is not their fault and they are not alone.

Survivor narratives (testimonies) can be important in reducing shame and fostering hope [33]. However, their use must be governed by a rigorous ethical framework centered on survivor consent and confidentiality [34]. The concept of **vicarious resilience** which refers to the positive impact of witnessing another person’s recovery, offers a critical insight. By carefully presenting stories that focus on resilience and successful help-seeking, a chatbot can instill hope and model practical strategies.

3.2 Designing Conversational Agents for Human Support

The design of a conversational agent for a vulnerable population requires a synthesis of principles from HCI, conversational design, and psychology. A foundational requirement is a clear and appropriate **persona** [12]. In a support context, the persona must be empathetic, warm, and non-judgmental [5]. Studies show a social-oriented communication style boosts user satisfaction and trust [35, 36]. The conversation should be natural, brief, and contextual. Beyond a static, pre-defined personality, the ability for users to have influence in shaping the chatbot’s

3.3 Retrieval-Augmented Generation (RAG) for Factual and Safe AI

interaction style is emerging as a critical factor. For instance, recent research highlights that individuals report better emotional support outcomes when they can actively construct and customize an LLM-powered chatbot’s persona to meet their specific needs [12].

3.3 Retrieval-Augmented Generation (RAG) for Factual and Safe AI

The selection of Retrieval-Augmented Generation (RAG) is a deliberate choice driven by the need for accuracy and safety. A standard LLM is prone to “hallucination,” generating false information, which is a catastrophic failure in this context [13, 14]. RAG mitigates this risk by first retrieving relevant, verified information from a curated knowledge base and then using that information to ground the LLM’s response [13].

This paradigm offers three key advantages:

1. **Accuracy and Factual Grounding:** RAG grounds every response in a pre-verified source of truth, ensuring information is factually correct and reliable [13].
2. **Transparency and Trust:** Because the response is based on specific retrieved documents, the system can cite its sources, allowing users to verify information and fostering trust.
3. **Safety and Control:** The RAG model’s knowledge is confined to the curated knowledge base, preventing it from accessing or repeating harmful information from the open internet and ensuring compliance with data privacy regulations like GDPR.

3.3 Retrieval-Augmented Generation (RAG) for Factual and Safe AI

Strategically, RAG allows for dynamic, localised support. The knowledge base can be continuously updated with the latest information without costly retraining of the entire LLM, ensuring the chatbot’s advice remains current and relevant [13].

Chapter 4

Methodology

This chapter details the proposed five-phase methodology for the research and development of the chatbot. The approach is iterative and user-centred, ensuring that ethical considerations and survivor safety are paramount at every stage.

4.1 Phase I: Curation of a Localised, Vetted Knowledge Base (KB)

The foundation of a reliable RAG system is the quality of its knowledge base. This phase is dedicated to the systematic collection, cleaning, and structuring of a comprehensive repository of information specific to domestic abuse in Ireland, with a pilot focus on County Galway.

4.1.1 Data Sourcing Strategy

A data collection strategy that involves multiple components will be used.

- **Legal and Governmental Sources:** Official documentation from Irish state bodies, including the *Domestic Violence Act 2018* , and information

4.2 Phase II: RAG System Architecture and Implementation

from the Department of Justice , the Courts Service, the Legal Aid Board, and Citizens Information [23].

- **NGO and Third-Sector Sources:** Materials from national organisations like Women’s Aid, Men’s Aid, and Safe Ireland, and local Galway services from COPE Galway.
- **Academic and Research Sources:** Related papers will inform the chatbot’s understanding of survivor needs [5, 6, 37].
- **Survivor Narratives:** Ethically sourced and anonymised survivor testimonies will be included, focusing on resilience and recovery to foster hope [34].

4.1.2 Data Preparation and Structuring

The raw data will be carefully prepared for using.

- **Chunking Strategy:** Documents will be segmented into small, semantically coherent chunks, respecting logical boundaries to preserve context, a best practice for retrieval accuracy.
- **Metadata Tagging:** Each chunk will be enriched with structured metadata tags (e.g., source, topic, audience, location) to allow for highly specific, context-aware retrieval.

4.2 Phase II: RAG System Architecture and Implementation

This phase covers the technical design and build of the RAG pipeline.

4.2 Phase II: RAG System Architecture and Implementation

Table 4.1: Sample Structure for the Knowledge Base Source Matrix

Data Source	Information Category	Key Metadata Tags	Rationale for Inclusion
Department of Justice	Legal Rights & Definitions	'legal', 'force_control', 'national'	Provides foundational legal definitions of abuse and offenses in Ireland. Essential for accuracy.
COPE Galway	Local Services & Refuge	'local_service', 'refuge', 'galway', 'women', 'children'	Provides specific, actionable information on support available in the pilot location of Galway.
Men's Aid Ireland	Male Survivor Support	'male_survivor', 'helpline', 'national', 'statistics'	Offers tailored information relevant to male victims.
Women's Aid	Safety Planning	'safety_plan', 'practical_advice', 'national'	Contains expert-vetted, practical guidance for survivors on increasing safety.
Tusla	Child Support	'child_support', 'tusla', 'reporting', 'national'	Informs responses related to the welfare of children, a critical concern.
Ethically Sourced Story	Peer Support & Resilience	'survivor_story', 'resilience', 'hope'	To provide hope and reduce isolation by showing recovery is possible, used only with explicit consent.

4.2.1 Model and Component Selection

- **Retriever:** A dense retriever, likely based on a Sentence-BERT (SBERT) architecture, will be fine-tuned on a custom dataset of Irish-specific questions to ensure it excels at identifying the most relevant document chunks.
- **Generator:** A powerful Large Language Model (LLM), such as an open-source model like Llama 3 or a proprietary model via API like GPT-4o, will be selected based on performance, cost, and data privacy guarantees.
- **Vector Database:** Text chunks will be converted into numerical embeddings and stored in a specialised vector database (ChromaDB) optimised for fast semantic similarity search.

4.2.2 The RAG Pipeline

The end-to-end system will operate through a defined pipeline to ensure every response is grounded and context-aware [5, 13]:

1. **Query Input:** The system receives a user query.
2. **Query Embedding:** The query is converted into a vector representation.
3. **Context Retrieval:** The vector database returns the 'top-k' most semantically similar text chunks from the knowledge base.
4. **Prompt Augmentation:** The retrieved chunks are combined with the original query and a carefully crafted instruction prompt.
5. **Response Generation:** The augmented prompt is sent to the LLM generator.
6. **Grounded Response:** The LLM synthesises the information to generate a coherent, natural-language response.

4.2 Phase II: RAG System Architecture and Implementation

7. **Output Delivery:** The final response is delivered, with citations to the source documents to enhance transparency.

4.2.3 Development Tools and Workflow

To facilitate the development process, this project will leverage specialised open-source tools designed for building RAG applications.

- **Crawl4AI:** For the data sourcing and knowledge base creation phase (Phase I), **Crawl4AI** will be utilised. This tool is designed to automate the process of scraping and extracting clean, structured information from websites. Its justification lies in its efficiency; it can systematically gather content from the specified legal, governmental, and NGO websites, converting unstructured web pages into a clean format suitable for the chunking and embedding process. This significantly accelerates the creation of a comprehensive and up-to-date knowledge base, which is the foundation of the RAG system.
- **Open WebUI:** For the user-facing interface and evaluation phases (Phase III, IV, and V), **Open WebUI** will be employed as the front-end for the chatbot prototype. This choice is justified by its flexibility and user-centric design. Open WebUI is compatible with a wide range of LLM backends, allowing for easy integration with the chosen generator model. Its open-source nature means it can be customised to incorporate the specific design features required for this project, such as a persistent “Quick Exit” button and a clear, non-intrusive process. Its intuitive interface is also ideal for conducting heuristic evaluations with experts and user-based testing with proxy groups, as it provides a realistic and accessible chat environment.

4.3 Phase III: Persona Design

This phase focuses on crafting the user-facing aspects of the chatbot, ensuring the interaction is psychologically safe and empathetic.

4.3.1 Persona Definition

The chatbot will be designed with a persona that is [5]:

- **Empathetic and Validating:** Using phrases like “That sounds incredibly difficult” and “It’s not your fault”.
- **Calm, Patient, and Predictable:** A consistent and reassuring tone to create a sense of safety.
- **Clear and Simple:** Using plain language, short sentences, and bullet points.
- **Transparent and Humble:** Being upfront about its AI identity and limitations, managing user expectations and building trust.

4.3.2 Dialogue Flow Design

The conversational structure will be carefully planned.

- **Initial Interaction:** The first interaction will introduce the chatbot as an AI, state its purpose and limitations, present the “Quick Exit” button, and provide a link to its privacy policy.
- **Interaction Loop:** The chatbot will use clarifying questions (e.g., “To help me find the right information, could you tell me...?”) and reflective listening to ensure understanding and build friendly feelings.

4.4 Phase IV: Ethical and Safety Protocol Implementation

- **Response Structure:** Answers will be short and scannable, using lists and bolded keywords to reduce cognitive load for users in distress.

4.3.3 Integrating Survivor Narratives

The integration of survivor stories will be handled with extreme care. Narratives will be offered as an optional, opt-in resource to respect user choice [37]. For example, “Some people find it helpful to hear how others have handled this. Would you like to read a short, anonymous story?” This approach gives the user full control. All narratives will be fully anonymised and used only with explicit, informed consent.

4.4 Phase IV: Ethical and Safety Protocol Implementation

This phase is dedicated to building robust safety features into the chatbot’s architecture.

4.4.1 User Safety Features

- **Quick Exit Mechanism:** A persistent “Quick Exit” button will immediately close the chat, redirect to a neutral website, and clear the browser session history [5].
- **Data Anonymization and Deletion:** The system will not store Personally Identifiable Information (PII). Users will have the option to delete their conversation history permanently [5].

4.4 Phase IV: Ethical and Safety Protocol Implementation

Table 4.2: Chatbot Features

Principle	Corresponding Chatbot Feature	Dialogue Example	Rationale/Impact on User
Safety	Persistent “Quick Exit” button. Clear statement of non-emergency role. active detection of crisis keywords.	“If you are in immediate danger, please close this chat and call 999 now.”	Prioritises physical safety. Creates psychological safety with an escape route.
Trust	Clear AI self-introduction. Citing sources for information provided.	“I’m an AI assistant. The details about Safety Orders come directly from the Courts Service of Ireland.”	Builds trust by managing expectations and providing verifiable, authoritative information.
Peer Support	Optional, consent-based sharing of anonymised survivor narratives focused on resilience.	“It can feel very lonely. Would you like to read a short, anonymous story from someone in a similar situation?”	Reduces isolation and fosters hope by showing recovery is possible.
participant	Using clarifying questions and reflective listening.	“Let’s work through this together. What feels most important to you right now: housing, legal, or safety?”	Levels the power dynamic, making the user an active participant.
Choice	Always presenting options rather than instructions.	“There are a few options you could consider. Which would feel most helpful to you?”	Restores a sense of control that often taken away by abuse.
Sensitivity	Inclusive language. Access to information for specific groups (e.g., male survivors).	“Abuse can happen to anyone. If you are a man experiencing abuse, Men’s Aid can help. Would you like their details?”	Ensures the chatbot is relevant and welcoming to all users.

4.4.2 Escalation Pathway

The chatbot must recognise and respond to acute crisis.

- **Crisis Keyword Detection:** A system will monitor for high-risk keywords related to immediate danger or suicidal ideation.
- **Emergency Escalation Protocol:** If a high-risk keyword is detected,

the standard flow will be interrupted. A clear message will urge the user to contact emergency services (An Garda Síochána on 999/112) and provide the number for a 24/7 crisis helpline.

4.5 Phase V: Proposed Evaluation Framework

A multi-faceted, mixed-methods evaluation framework is proposed.

4.5.1 Technical Evaluation

The accuracy and relevance of the RAG system will be quantitatively measured using established frameworks like RAGAs (Retrieval-Augmented Generation Assessment) [38]. Key metrics will include Faithfulness, Answer Relevance, and Context Precision/Recall.

4.5.2 Heuristic Evaluation by Experts

Domain experts (social workers and legal professionals) will conduct a heuristic evaluation against the principles outlined in Table 4.2, providing qualitative feedback on the chatbot’s tone, safety, and accuracy.

4.5.3 User-Based Evaluation

Initial user-based evaluation will be conducted with carefully selected **proxy user groups** (e.g., social work students, advocates) in controlled environments to reduce ethical risks. Participants will complete tasks using the chatbot (for example, “Find out how to apply for a Barring Order”), collecting rich contextual feedback on user experience, clarity of information, and preference of the persona.

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