Kalamna - AI Customer Support Egyptian Service ERD V2

Overview

The AI Customer Support Egyptian Service enables Business to integrate a smart AI chatbot into their websites or apps through an embeddable web widget.
It supports text (and future voice) communication in Egyptian Arabic, allowing businesses to automate responses based on their knowledge base, while admins can manage settings, analyze reports, and respond manually when needed.

1. Business

Field	Type	Description
id	UUID	Primary key
name	String	Registered business name
email	String	Contact or registration email
description	Text	Overview of the company
industry	String	Industry category
domain_url	String	Website domain where the widget is embedded
created_at	Timestamp	Record creation timestamp
updated_at	Timestamp	Last update timestamp

Notes:

- Represents each client business using the platform.
- Acts as a parent entity for admins, settings, authentication keys, users, and analytics.

2. BusinessSetting

Field	Type	Description
id	UUID	Primary key
bot_name	String	Optional; defaults to system name but can be customized
tone_style	String	Predefined choice (e.g., formal, friendly, neutral)
auto_reply_enabled	Boolean	Determines if AI auto-replies or waits for human admin input
operating_hour_start	Time	Business operating start time

Field	Type	Description
operating_hour_end	Time	Business operating end time
business_id	FK → Business	One-to-one link to owning company
created_at	Timestamp	Record creation timestamp

Notes:

- Controls chatbot personality, response mode, and business availability.
- Separated to isolate configuration logic from business metadata.

3. BusinessAuth

Field	Type	Description
id	UUID	Primary key
business_id	FK → Business	Linked to one business
api_key	String (hashed)	Unique key used to authenticate API or widget requests
is_active	Boolean	Determines whether the key is valid for use
created_at	Timestamp	Record creation timestamp

Notes:

- Provides secure integration for external APIs or widgets.
- Rotatable and can be deactivated without affecting the main business record.

4. BusinessAdmin

Field	Type	Description
id	UUID	Primary key
name	String	Admin's full name
email	String	Unique login email
password	String	Encrypted password
role	String	Role indicator choices ("owner" or "staff")
business_id	FK → Business	Associated to business
created_at	Timestamp	Account creation timestamp

Notes:

- Each business can have multiple admins.

- Owners manage authentication keys, configurations, and analytics access.

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5. EndUser

Field	Type	Description
id	UUID	Primary key
business_id	FK → Business	Company this user interacts with
external_id	String	Optional (e.g., WhatsApp, Messenger ID)
name	String (optional)	End-user display name
created_at	Timestamp	First interaction timestamp
updated_at	Timestamp	Last interaction timestamp

Notes:

- Represents real customers interacting with the chatbot.
- Data remains minimal for privacy; no login is required.

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6. ChatSession

Field	Type	Description
id	UUID	Primary key
business_id	FK → Business	Chat belongs to a specific company
end_user_id	FK → EndUser	Linked user
session_token	String	Unique identifier for the chat session
status	String	Choices > "active", "closed", or "expired"
started_at	Timestamp	Start time of chat
ended_at	Timestamp	End time of chat
feedback_id	FK → Feedback	Optional feedback link

Notes:

- Tracks each conversation between a business and an end user.
- Enables reloading previous sessions or conversation histories.

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7. ChatMessage

Field	Type	Description

Field	Type	Description
id	UUID	Primary key
session_id	FK → ChatSession	Belongs to a session
sender_type	String	"user", "bot", or "admin"
content	Text	Message body
ai_model_used	String	AI model used for the response (e.g., Gemini, NileChat)
emotion_detected	String	auto-tagged emotion (from emotion detection layer)
time	Timestamp	Message timestamp

Notes:

- Core unit of conversation storage.
- Enhances analytics and AI fine-tuning accuracy.

8. Feedback

Field	Type	Description
id	UUID	Primary key
enduser_id	FK → Enduser	Associated to enduser
session_id	FK → ChatSession	Associated session
rating	Integer	Numeric rating (1–5)
comment	Text	User feedback text
submitted_at	Timestamp	Feedback submission timestamp

Notes:

- Tracks satisfaction and sentiment at the end of each chat.
- Used for business performance analytics.

9. KnowledgeBase

Field	Type	Description
id	UUID	Primary key
business_id	FK → Business	Linked business
base_type	String	"text" or "file"
content_json	JSON	Structured content for text entries

Field	Type	Description
file_url	String	Path to uploaded files (null if text type)
file_type	String	MIME type for uploaded files
embedding_vector	Vector	Generated vector representation for RAG
created_at	Timestamp	Creation timestamp

Notes:

- Represents structured business knowledge used for retrieval-augmented generation.
- Embeddings generated automatically through LangChain and stored in the database.
- will normalize it to be have other table for vector in small size

10. AnalyticsReport

Field	Type	Description
id	UUID	Primary key
business_id	FK → Business	Business that owns this report
total_chats	Integer	Total sessions during report period
avg_response_time	Float	Mean bot response latency
user_satisfaction	Float	Average feedback score
report_period_start	Date	Start of reporting window
report_period_end	Date	End of reporting window
generated_at	Timestamp	Timestamp when report was generated

Notes:

- Automatically generated by background analytics workers.
- Used to evaluate customer satisfaction and agent performance.

11. VoiceInteraction (Future)

Field	Type	Description
id	UUID	Primary key
session_id	FK → ChatSession	Linked chat session
audio_file_url	String	Path to audio input
transcription_text	Text	Speech-to-text conversion

Field	Type	Description
detected_emotion	String	Optional detected emotional tone
created_at	Timestamp	Record timestamp

Notes:

- Extends chat capabilities to voice input/output.
- Will integrate with STT/TTS APIs for hybrid voice-text interaction.

12. Relationships Summary

Relationship	Type	Description
Business → BusinessAdmin	1 → Many	Multiple admins can manage one business.
Business → BusinessSetting	1 → 1	Each business has a single configuration profile.
Business → BusinessAuth	1 → Many	One business can have multiple API keys (rotatable).
Business → EndUser	1 → Many	Multiple users can chat with the same business bot.
Business → KnowledgeBase	1 → Many	Each business maintains several data sources.
Business → AnalyticsReport	1 → Many	Reports generated per business.
EndUser → ChatSession	1 → Many	Each user can have multiple chat sessions.
ChatSession → ChatMessage	1 → Many	Each chat session contains multiple messages.
ChatSession → Feedback	1 → 1	Optional feedback per session.
ChatSession → VoiceInteraction	1 → Many	Multiple voice messages can belong to a chat.

13. Data & AI Flow Summary

1. **Registration Phase**

   - Admin registers → new `Business`, `BusinessSetting`, and `BusinessAuth` created.
   - Default settings applied automatically.

2. **Widget Integration**

   - Website embeds the widget using the unique API key from `BusinessAuth`.
   - The API key is verified for active status before initiating a session.

3. **Chat Initialization**

   - End user opens chat → new `EndUser` + `ChatSession` created.
   - System checks business `operating_hour_start` and `auto_reply_enabled` from `BusinessSetting`.

4. **Conversation Flow**

- Messages stored in `ChatMessage` .
- AI orchestrator retrieves contextual data from `KnowledgeBase` via embeddings (RAG pipeline).
- Model response stored with metadata (`ai_model_used` , `emotion_detected`).

5. **Feedback Capture**

- Once chat ends, user submits feedback → saved to `Feedback` .

6. **Analytics & Monitoring**

- Background job aggregates sessions, feedback, and timing metrics → stores results in `AnalyticsReport` .

7. **Future Voice Support**

- Voice input saved in `VoiceInteraction` , transcribed and analyzed for emotion and intent.

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14. Summary

This version introduces **clear modular separation** and **secure authentication control**, resulting in:

- Stronger **security model** via per-business API keys.
- Independent **configuration management** (tone, hours, auto-reply).
- Scalable **AI data pipeline** ready for real-world deployment.
- Future-ready **voice and emotion** integration support.