

# Applying an Omni-Channel Agentic AI Model to Optimise University Admissions Counselling and Data Capture

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**ABSTRACT:** This paper proposes an omnichannel agentic AI model to improve admissions counselling and lead data capture in university recruitment, where prospective applicants increasingly seek information across fragmented digital platforms. Unlike conventional, script-driven chatbots, an LLM-based agent can reason, plan a multi-turn dialogue, and invoke tools to: (i) provide accurate responses grounded in an institution-approved knowledge base; (ii) proactively standardise and capture contact details; and (iii) trigger handover to admissions officers through a human-in-the-loop (HITL) mechanism. The paper presents a three-layer reference architecture (omni-channel interaction–agentic cognition and orchestration–data and action), an operating workflow, and an illustrative implementation configuration aligned with the resource constraints of Vietnamese universities. The study concludes by discussing the managerial implications and requirements for safety, accountability, and personal data protection.

**KEYWORDS:** AI agents; university admissions; admissions counselling; omnichannel; human-in-the-loop; retrieval-augmented generation (RAG).

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## Introduction

In an increasingly competitive higher education market, particularly during the admissions season, a university's ability to attract and convert prospective applicants depends on reaching the right audience through the right channel at the right moment with an appropriate message. Prospective students and parents move fluidly across channels—websites, landing pages, Facebook/Zalo, email, and phone—and expect a seamless, personalised experience with rapid responses (Selingo, 2017; Kotler, Kartajaya, & Setiawan, 2021).

However, traditional admissions counselling, which relies primarily on human counsellors, is constrained by time, cost, and limited capacity to handle high volumes of inquiries in parallel; it also struggles to maintain consistent service quality across channels. Conversely, fully automated systems without human oversight can erode perceived trustworthiness and the “human touch,” which is critical in high-stakes educational decisions (Shneiderman, 2022).

While conventional chatbots can provide quick responses, they often lack contextual reasoning, timely updates, and robust handling of complex scenarios; as a result, they may resort to templated answers or outdated information (Zawacki-Richter et al., 2019; Popenici & Kerr, 2017). Large language models (LLMs), by contrast, can sustain natural dialogue and generate flexible responses. However, without grounding in authoritative institutional data—for example, via retrieval-augmented generation (RAG)—and without appropriate governance, LLM-based systems may produce hallucinations or inconsistent statements, creating communication and decision-making risks (Lewis et al., 2020; National Institute of Standards and Technology [NIST], 2023).

### **Research Aim and Research Questions**

To address these challenges, this paper proposes an admissions counselling AI agent that combines an LLM with institutional admissions data, omni-channel task orchestration, and a human-in-the-loop (HITL) mechanism to improve responsiveness while preserving quality control and trust (Wang et al., 2024; Xi et al., 2023; Shneiderman, 2022).

The study focuses on three research questions: (RQ1) What are the minimal functional and governance requirements for deploying an omni-channel agent in university admissions? (RQ2) Which architecture and data flows best support a seamless experience, data consistency, and scalability? (RQ3) How should HITL mechanisms be designed to enhance efficiency while ensuring counselling quality and safety?

The paper's contributions are threefold: (i) a set of design requirements and a reference architecture for an omni-channel admissions agent; (ii) an HITL operating mechanism linked to trigger points along the admissions funnel; and (iii) an illustrative implementation blueprint using readily available tools, with attention to feasibility in the Vietnamese context.

The scope of the paper is the pre-admissions stage: information counselling, interest screening, and standardised capture and synchronisation of contact data for handover to admissions staff. The paper does not address predictive analytics for admission likelihood or quota optimisation.

## Research Results

### *Theoretical background and related work*

Digital transformation in university governance has become increasingly salient, especially for “front-door” functions such as admissions, communication, and learner support. In Vietnam, the national digital transformation policy emphasises data, digital platforms, and digital services as key levers for improving operational efficiency and decision-making (Prime Minister of Vietnam, 2020). Accordingly, universities require an ecosystem that leverages data to optimise the learner journey through personalisation and omnichannel engagement, consistent with contemporary marketing thought in the digital era (Kotler et al., 2021).

An AI agent is an autonomous or semi-autonomous entity that receives goals, plans, uses tools, and interacts with its environment to complete tasks. With the emergence of LLMs, agents have gained the capacity to coordinate multi-step tasks through natural language rather than producing isolated conversational turns (Xi et al., 2023; Wang et al., 2024).

Compared with conventional chatbots, an agent can execute a sequence of actions: (i) eliciting user information, (ii) retrieving data from institutional systems (e.g., program information, tuition, admissions timelines), (iii) generating personalized advice, and (iv) triggering downstream actions—such as scheduling a call, sending materials, or writing to a CRM—under explicit policies and controls (Xi et al., 2023; Wang et al., 2024).

In admissions management, omnichannel design supports a consistent experience across channels and reduces discontinuities in applicants’ decision journeys. However, end-to-end automation may introduce risks related to misinformation, bias, and limited accountability. Therefore, the proposed model emphasises human-in-the-loop (HITL) as a core design principle: humans intervene at higher-risk points (e.g., sensitive content, tuition and scholarship policies, complaints), while the agent automates standardised and repetitive tasks (Kotler et al., 2021; Shneiderman, 2022; UNESCO, 2023; NIST, 2023).

In this context, the two frameworks are complementary: omnichannel addresses reach and continuity, whereas HITL supports quality assurance and responsibility at decision-critical touchpoints.

Recent research on AI in higher education highlights the potential for automation in admissions, academic advising, and student services, while also warning about challenges such as data quality, ethics, bias, and accountability (Zawacki-Richter et al., 2019; Popenici & Kerr, 2017).

In Vietnam, many universities have adopted digital channels (websites/landing pages, chatbots, call centers), yet they often lack an agentic model that integrates multiple channels, retrieves authoritative information in real time, and enforces quality control through HITL. This gap motivates the framework proposed in this paper.

The study follows a Design Science Research (DSR) orientation: (i) identifying the governance problem of omnichannel admissions counseling; (ii) establishing design objectives and criteria; (iii) developing the artifact (an AI agent model and an integration architecture); (iv) illustrating the artifact through a use-case scenario; and (v) outlining a future pilot and evaluation plan. Accordingly, the paper primarily contributes at the conceptual model and design framework levels rather than reporting

empirical measurements (Hevner et al., 2004; Peffers et al., 2007).

### **Proposed model**

The proposed model is expected to satisfy the following requirements: (1) personalized counseling based on applicant profiles and behaviors; (2) omnichannel integration (web/landing pages, Facebook/Zalo, email, phone); (3) access to authoritative information (RAG/knowledge base) to reduce misinformation; (4) support for nurturing workflows and lead conversion; (5) HITL, audit logs, and risk controls; and (6) compliance with personal data protection regulations and data processing principles (Government of Vietnam, 2023; NIST, 2023).

The proposed solution is organised as a three-layer reference architecture, with governance and compliance applied as cross-cutting concerns:

*First*, the omni-channel interaction layer consolidates messages from multiple touchpoints and maintains identity linkage and conversation state. This enables (a) recognising an applicant as they move between channels, (b) providing admissions staff with a complete interaction history, and (c) supplying context for personalised questioning and recommendations.

*Second*, the agentic cognition and orchestration layer separates two modules: (1) a knowledge module (RAG) that is constrained to institution-approved sources, and (2) a policy/workflow module that decides when to ask follow-up questions, request contact details, trigger nurturing, or initiate handover. This separation reduces the risk of inaccurate statements and strengthens controllability.

*Third*, the data and action layer integrates downstream systems (e.g., CRM, spreadsheets, admissions portals) to execute actions and synchronize data in real time, while preserving auditability.

A representative operating sequence includes: (1) receiving an inquiry from any channel; (2) intent classification and risk assessment; (3) retrieving authoritative knowledge via RAG; (4) generating a personalized response; (5) invoking tools/workflows (e.g., sending materials, creating a lead, scheduling a call); (6) handing over to human counselors at HITL trigger points; and (7) logging outcomes and feedback for iterative improvement (Lewis et al., 2020; Xi et al., 2023).

Human intervention points include approval of policy content, handling exceptions, responding when the agent reports high uncertainty, and managing complaints. This approach aligns with human-centred AI guidance that emphasises risk reduction and accountability (Shneiderman, 2022; UNESCO, 2023; NIST, 2023).

For stable operations, trigger conditions and service-level agreements (SLAs) should be specified for each lead state. For instance, “hot” leads—such as inquiries about deadlines, specific tuition amounts, or required documents—may require staff responses within 15 minutes, whereas “warm” leads can be nurtured through automated content sequences before a call. Standardising triggers and SLAs helps harmonise counselling quality across staff and generates data for performance evaluation.

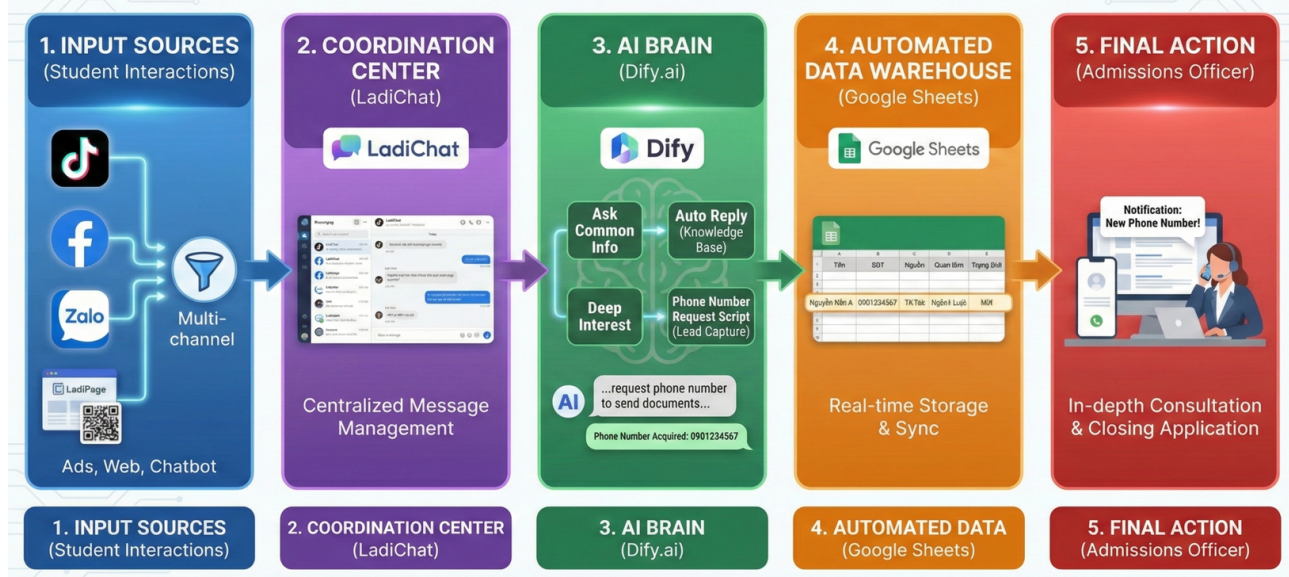
For an illustrative implementation, the paper suggests using Dify—an open-source platform for building LLM-enabled applications—to design agent workflows and the RAG pipeline, combined with LadiChat/LadiPage for omni-channel intake and automation triggers (LangGenius, n.d.; LadiChat, n.d.).

A key implementation practice is knowledge base governance: input documents should be

approved, versioned, and timestamped with effective dates, and the update process must have clear ownership. For personal data, establish access controls, access logs, and retention/deletion policies to comply with applicable regulations.

**Figure 1**

*Omni-channel agentic AI model for admissions counselling (illustrative configuration)*



Source: author(s) own development.

**Conclusions**

This study proposes an omnichannel agentic AI model that integrates practical components, including an omnichannel inbox, an LLM-based agent with RAG, and a real-time data capture layer. The shift from a passive chatbot to a task-oriented agent is expected to enhance responsiveness and operational consistency while retaining human oversight through HITL. The paper offers a reference architecture and an illustrative configuration that may be feasible for many Vietnamese universities, given common resource constraints.

For higher education institutions, early investment in data infrastructure and in staff capacity-building for agent design and knowledge governance is advisable to remain competitive in digital admissions. For future research, the proposed model should be piloted and evaluated using measurable indicators, and its application may be extended to other stages of the education value chain, such as academic support, current student services, and alums engagement.

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