

AI-Driven Conversational Models for Supporting Migrant Career Guidance and Labour Market Integration: A Scoping Review

Bisaso Samuel¹, Muhumuza Gilbert²

¹Department of Computer Science, Selinus University, Italy.

²KlugCode Opleidingen BV, Netherlands.

To Cite this Article: Bisaso Samuel¹, Muhumuza Gilbert², "AI-Driven Conversational Models for Supporting Migrant Career Guidance and Labour Market Integration: A Scoping Review", *International Journal of Scientific Research in Engineering & Technology*, Volume 05, Issue 01, January-February 2025, PP: 10-21.

Abstract: Migrants face significant challenges in accessing career guidance due to language barriers, cultural differences, and unfamiliarity with local labor markets. This scoping review synthesizes existing literature on AI-driven conversational models designed to address these challenges and support migrant labor market integration. By analyzing key themes including natural language processing (NLP), real-time knowledge integration, personalized recommendations, user-centered design, and ethical considerations the review identifies essential technical, usability, and ethical requirements for developing effective AI-driven career guidance models. Key findings highlight the necessity of multilingual NLP, contextual awareness, and adaptive machine learning models for personalized support, alongside user-focused features such as cultural sensitivity, intuitive interfaces, and psychometric assessments. Ethical considerations, including bias mitigation, transparency, and data privacy, are critical for building trust and ensuring fairness. The review underscores the interplay between these factors, presenting a comprehensive framework for future AI-driven career guidance solutions. It also offers actionable insights for researchers and developers to create technically sophisticated and socially responsible models, ultimately empowering migrants to navigate career pathways and achieve sustainable economic integration.

Key Word: Conversational Models; Artificial Intelligence; Natural Language Processing; Career Guidance, Chatbots.

1. INTRODUCTION

The integration of migrants into the labor market is a cornerstone of social cohesion and economic prosperity in host countries (Přvarová, 2020). As well as being a source of diverse skills, experiences, and perspectives that can enrich societies and drive innovation, however, their journey toward meaningful employment is often fraught with challenges (Landolt & Thieme, 2018; Tountopoulou et al., 2021). Language barriers, non-recognition of qualifications, unfamiliarity with local labor markets, and cultural differences create significant obstacles to accessing appropriate career guidance. Without adequate support, migrants risk being underemployed, unemployed, or trapped in low-skilled jobs, perpetuating cycles of poverty and social exclusion (Sultana, 2010). The issue has grown in importance in light of recent socio-economic trends and policy changes, highlighting the urgent need for innovative solutions. In an era of rapid technological advancement, Artificial Intelligence (AI) offers transformative potential to address these challenges (Susar & Aquaro, 2019). Among AI technologies, conversational models such as chatbots and virtual assistants have emerged as powerful tools for delivering scalable, personalized, and accessible career guidance (D'Silva et al., 2020). These systems leverage Natural Language Processing (NLP) to interact with users in human-like conversations, providing tailored advice, answering questions, and guiding users through complex processes such as credential recognition, job searching, and skills development (Con et al., 2022). By drawing on the concept of breaking down language barriers and adapting to cultural nuances, AI-driven conversational models can empower migrants to navigate the labor market with confidence and clarity (Kotiyal et al., 2022; Tejwani et al., 2022).

Despite their promise, the design and implementation of AI-driven conversational models for migrant career guidance present unique challenges. Migrant populations are highly diverse, encompassing individuals with varying linguistic, cultural, educational, and professional backgrounds (Wanner et al., 2021). A one-size-fits-all approach is insufficient; instead, these systems must be designed with a deep understanding of the specific needs and contexts of migrant users. This requires not only advanced technical capabilities but also a commitment to user-centered design, cultural sensitivity, and ethical considerations (Kuneva & Hough, 2023). For instance, how can AI systems ensure fairness and avoid perpetuating biases? How can they build trust with users who may be skeptical of technology? One major theoretical issue that has dominated the field for many years concerns how can they balance automation with the human touch that is often essential for effective career guidance.

This scoping review seeks to address these questions by mapping the existing peer-reviewed literature on AI-driven conversational models for career guidance. Focusing on the European Union (EU) context, where migration is a significant social and economic issue, the review aims to identify the key requirements for designing and developing these models. The central question in this study asks: What are the requirements for designing and developing an AI-driven conversational model to deliver

effective career guidance for migrants? By synthesizing the current evidence, this review provides a comprehensive framework for future research and practice, offering actionable insights for creating conversational AI models that are not only technically robust but also socially responsible and inclusive (McTear, 2022). The significance of this research extends beyond the immediate goal of supporting migrant labor market integration. In addition, by addressing the barriers faced by migrants, AI-driven conversational models can contribute to broader societal goals such as reducing inequality, promoting social inclusion, and fostering economic growth (Jarupreechachan & Surasak, 2023). Moreover, the lessons learned from this context can inform the development of AI systems for other marginalized or underserved populations, such as refugees, displaced persons, and individuals with disabilities (Checketts, 2022).

In the following sections, this review outlines its methodology, presents the findings, and discusses their implications for research, practice, and policy. Drawing on an extensive range of sources, the authors set out the different ways in which bridging the gap between technology and social impact, this study aims to advance the discourse on AI-driven solutions for migrants' career guidance, offering a roadmap for creating systems that empower individuals to achieve their full potential in their new communities (Beduschi, 2022).

II.METHODS

Scoping Review Methodology

This review follows the scoping review methodology developed by Arksey and O'Malley, which consists of six key steps: (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies for inclusion, (4) charting the data, (5) collating, summarizing, and reporting the results, and (6) conducting consultations (Arksey & O'Malley, 2005). This methodological approach was chosen because it provides a comprehensive and flexible way to map the existing literature on a topic, offering a broad overview rather than a narrow, in-depth analysis (Mak & Thomas, 2022). Unlike systematic reviews, scoping reviews allow for the inclusion of a wide range of study designs, making them particularly suitable for exploring emerging or complex research areas (Arksey & O'Malley, 2005).

Search Strategy

A comprehensive search of electronic databases was conducted to identify peer-reviewed publications relevant to AI-driven conversational models for career guidance. The search strategy employed a combination of keywords and controlled vocabulary related to key concepts such as "migration," "career guidance," "artificial intelligence," "chatbots," "natural language processing," and "e-learning." Databases included Google Scholar, semantic scholar, ACM Digital Library, springer, and IEEE Xplore. Boolean operators (AND, OR) were used to combine terms, and the search was restricted to English-language publications from 2014 to 2024. For example, an example search string is: (migration OR immigrant OR refugee) AND ('career guidance' OR 'career counseling' OR 'vocational guidance') AND ('artificial intelligence' OR 'chatbots' OR 'conversational AI') AND ('natural language processing' OR 'dialogue system'). A manual search of reference lists from selected studies was also performed to ensure comprehensiveness.

Identification of Studies

This review employed a comprehensive and highly sensitive search strategy to identify, screen, and analyze studies relevant to AI-driven conversational models for migrant career guidance. The search focused on articles published between 2016 and 2023, as this period marks significant advancements in AI technologies, particularly in natural language processing (NLP) and conversational AI, which are critical for addressing the unique needs of migrant populations. An initial search across multiple databases yielded 500 results (after removing duplicates), of which 21 studies met the inclusion criteria. These studies were carefully reviewed, and their details, including the AI models, methods, technologies, and identified requirements, are summarized in Table 1.

Table1: Summary of Scoping Review Papers

Title	Methods/Model	Intervention Technology/Techniques	Objective	Study Context	Identified Requirements
(Dhamdhere et al., 2024)	NLP	Chatbot	To develop an AI conversational model for personalized career guidance	University students seeking career advice	Natural language understanding, personalized career suggestions, user adaptability
(Prakash et al., 2024)	Recommendation engine pipeline	Chatbot	To provide personalized job recommendations using AI	Job seekers in various industries	Job role classification, real-time job alerts, resume parsing
(Sharma et al., 2024)	LLMS	GPT Model	To explore career guidance using GPT-based models	Higher education students	Conversational AI, dynamic career planning, automated mentoring

AI-Driven Conversational Models for Supporting Migrant Career Guidance and Labour Market Integration: A Scoping Review

(Joshi et al., 2024)	Google Generative AI	Chatbot, Python, Streamlit	To create an AI-driven career guidance tool	University and high school students	Interactive career quizzes, AI-driven skill assessment, personalized suggestions
(Jain et al., 2023)	Random Forest models and NLP	Web-based chatbot	To assist older adults with career support via AI	Older adults re-entering the workforce	Voice-assisted chatbot, simplified UI, job application assistance
(Gowda et al., 2024)	GPT-3.5	Web Application (with python)	To design and test an AI-powered career counseling conversational model integrated into Facebook Messenger	Students and early-career professionals	Seamless chatbot integration, NLP-enhanced Q&A, career resources access
(Reddy et al., 2022)	Rule Based Chatbot	Flask, Twilio, Python, ngrok, WhatsApp bot	To develop a WhatsApp chatbot for career guidance	Job seekers using WhatsApp	Multilingual support, quick response system, mobile-friendly UI
(Dongre et al., 2021)	Query Processing, NLP	Chatbot, Dialogflow	To assess the effectiveness of web-based career counseling chatbots	University students	AI-driven FAQ, career scenario simulations, interactive modules
(Elalami et al., 2023)	Natural language processing (NLP)	Chatbot, Dialogflow, Firebase, Android application	To develop an intelligent chatbot for supporting academic programs selection for student career choices	University academic programs	Automated academic advising, AI-powered tutoring, career goal tracking
(Raut et al., 2021)	Natural language processing (NLP), NLTK	Chatbot	To develop an AI-powered career guidance chatbot with real-time responses	Students in India	Multi-platform support, contextual career insights, real-time response
(Bijotkar et al., 2021)	NLP, NLU	Dialogflow, Chatbot, Facebook, Messenger, Slack, Web demo	To design a conversational model using Google Dialogflow for guiding job interviews	Job seekers preparing for interviews	Mock interview simulations, real-time feedback, automated coaching
(Santosh Mhatre et al., 2024)	User-Centric Design, NLP, Support Vector Machine, Decision Tree Classifier	Chatbot, Web Application	To develop and test an AI conversational model for conducting career-based counseling	High school and college students	Psychometric assessments, career path recommendations, AI-driven Q&A
(Ohm & K., 2019)	HMM (Hidden Markov Model), Baum-Welch algorithm, Discriminative training	Chatbot	To design, develop and test an AI-driven career guidance conversational model with real-time industry insights	Various industries and student groups	Adaptive learning, dynamic knowledge base, real-time industry insights
(Talib et al., 2023)	LLMS, LLAMA2, GPT, and PaLM	Chatbot	To evaluate a mobile-based AI-driven career guidance model for	Moroccan students and job seekers	Lightweight chatbot, offline mode, adaptive suggestions

			students in Morocco		
(Satam et al., 2010)	Flowxo Framework, NLP, Machine learning (ML)	Chatbot, Dialogflow	To design an AI-based mentorship framework	Mentoring and career guidance organizations	AI-driven mentorship matching, goal tracking, behavioral analytics
(Martín-Gutierrez et al., 2020)	Content-based filtering, Recommender system Pipeline	Chatbot, Recommender System Engine	To develop a multi-modal AI framework for migrant integration	Migrants seeking career integration	Multi-language support, job market integration, skill development tracking
(Gowda et al., 2024)	GPT-3.5, NLP	Chatbot	To leverage AI for career counseling chatbots	University career centers	Deep learning-based career matching, context-aware suggestions, AI-enhanced advising
(Vidhya et al., 2024)	Interest-Based Clustering, Seq2Seq and RNN (Recurrent Neural Network)	Mentor Matching, Career Recommendations, Response Generation, Feedback Collection and Analysis	To create an AI-powered career mentorship platform	Early-career professionals	AI mentor matching, industry insights, user progress tracking
(Kumbhar et al., 2023)	Recurrent neural network (RNN) and Long Short Term Memory (LSTM)	Chatbot	To implement deep learning in career guidance and model using recommendation techniques	Higher education students	Deep learning-based recommendations, AI-enhanced decision support, automated career assessment
(Dr. Kalaivazhi Vijayaragavan et al., 2024)	PyTorch, Natural Language Processing (NLP)	Chatbot	To integrate the NLP-driven conversational model into a career guidance application	Career guidance web applications	Advanced NLP for user queries, automated career insights, interactive chat
(Nguyen et al., 2022)	Ontology modelling, RASA's model, Recommendation pipeline	Context-aware knowledge base, Chatbot	To develop a personalized career counseling chatbot	IT professionals and students	AI-driven skill mapping, job opportunity alerts, personalized recommendations
(Lokhande et al., 2023)	DialogFlow, natural language processing (NLP)	Conversational AI, chatbot	To build a conversational AI model for career placement services	Job placement agencies	AI-powered resume analysis, job fit prediction, real-time job market updates

PRISMA Guidelines

To ensure methodological rigor and transparency, this scoping review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. The process followed a structured approach:

1. Identification of the research question
2. Development and implementation of the search strategy
3. Screening of titles and abstracts
4. Full-text assessment of selected articles
5. Data extraction and charting
6. Thematic synthesis and reporting of results.

The PRISMA-ScR checklist was used to document each step, ensuring the review process was systematic, reproducible, and transparent. This adherence to established guidelines enhances the reliability and credibility of the findings.

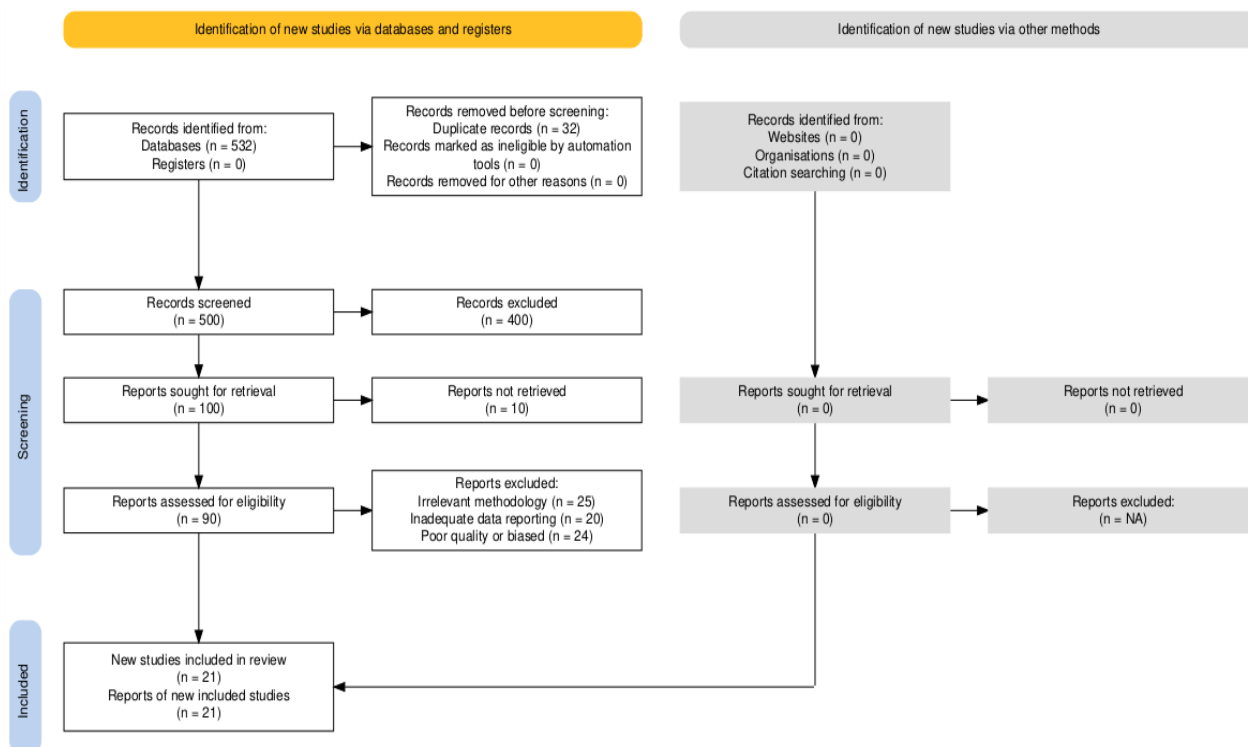


Figure 1: Flow diagram for the selected studies.

Inclusion criteria:

The inclusion criteria for selecting publications were designed to ensure the review focused on relevance to the study. Studies were included if they met the following conditions:

1. They presented empirical research on the design, development, implementation, or evaluation of AI-driven conversational models for career guidance, or counseling, or support.
2. They were published as peer-reviewed journal articles or conference proceedings.
3. They focused on or had significant relevance to migrant populations or similarly disadvantaged communities.
4. They addressed one or more of the following requirements: language support, cultural sensitivity, legal and qualification complexities, real-time information access, and personalized guidance.

Exclusion criteria:

Conversely, studies were excluded if they:

1. Were not peer-reviewed (such as., white papers, blog posts, news articles, or government documents);
2. Primarily focused on fields unrelated to AI-driven conversational models;
3. Addressed only technical requirements for AI implementation without considering user or ethical aspects; or
4. Were not published in English or were published before 2016.

These criteria ensured the review remained focused on credible, relevant, and contemporary research.

Quality Assessment

The quality of each included study was assessed using a modified version of the Mixed Methods Appraisal Tool (MMAT). While this scoping review did not exclude studies based on quality, the appraisal process provided valuable insights into the strength of the evidence and guided the interpretation of results. It is acknowledged that the MMAT is not designed to provide a perfect assessment of quality and serves more as a way of evaluating different aspects of a paper. The MMAT evaluated several dimensions of each study, including (1) the clarity of research questions or objectives; (2) the appropriateness of the study design for addressing the research question; (3) the validity and reliability of data collection methods; (4) the transparency and rigor of the data analysis process; (5) the clarity of reported results and findings; and (6) the transparency of the discussion and limitations. This systematic appraisal ensured that the review critically engaged with the literature and provided a balanced synthesis of the evidence.

Data Extraction and Synthesis

Data were extracted from the selected studies using a predefined template, which captured key information such as: (1) study objectives; (2) target population demographics; (3) AI models, techniques, and algorithms used; (4) data sources and collection methods; (5) evaluation metrics and results; and (6) ethical considerations, limitations, and identified gaps. The extracted data were then analyzed through thematic synthesis, a method that involves identifying recurring patterns, themes, and requirements across the literature. This approach allowed for the integration of findings from diverse studies, providing a comprehensive overview of the requirements for designing and developing AI-driven conversational models for migrant populations. The synthesis process was iterative, ensuring that emerging themes were rigorously examined and validated against the data.

Table 2: Description of the identified conversational AI interventions' strengths and weaknesses

Author	Intervention	Strengths	Weaknesses
(Dhamdhere et al., 2024)	An AI chatbot for career guidance - ASPIREAI	An AI-driven approach that can be scalable. Provides personalized career information, job search advice, and educational recommendations by using LLMs. Offers a blend of "accurate knowledge and insights" with a "seamless communication style."	Potential for biases in the AI model if the training data is not carefully curated (inferred). Limitations in understanding complex queries.
(Prakash et al., 2024)	A personalized job recommendation ai chatbot: CAREER CONNECT	Personalized job recommendations through AI. Aimed at young job seekers. Uses open-source data coupled with state-of-the-art AI technologies to assist with career progression. Provides skills gap analysis.	Personalization relies on data accuracy and algorithm effectiveness. Potential for bias in recommendations.
(Sharma et al., 2024)	Career guidance and roadmaps to success using GPT-Model	AI-driven and personalized using a GPT model.	GPT could generate inaccurate or inappropriate advice (inferred from general chatbot limitations). Reliance on a language model trained for the Indian education system may limit generalizability (inferred).
(Santosh Mhatre et al., 2024)	An edu counselor, a career counseling chatbot	Addresses the problem of bad career choices due to family pressure and lack of understanding.	Issues remain in comprehending human interactions and different user needs (acknowledges ongoing limitations). May impact younger generation who is still being educated.
(Ohm & K., 2019)	Chatbot for career guidance using AI	Helps students choose the right career by giving appropriate responses. Thinks like human beings, reducing stress for students. Accurate knowledge base allows for quick answers. Takes both voice and text as input (based on API).	Name might be culturally specific and not resonate with all users. Chatbot's effectiveness depends on its design and knowledge base. Potential for limited understanding of individual user needs.
(Talib et al., 2023)	A mobile app AI-driven career guidance in Morocco: An innovative Mobile approach	Mobile access, potentially reaching a wider audience in Morocco. AI-driven guidance promises efficiency and personalization. Addresses specific socio-cultural and linguistic contexts of Morocco.	Reliance on mobile technology may exclude users with limited access or technical skills. Cultural relevance and language support are crucial for success in Morocco.

(Martín-Gutierrez et al., 2020)	A novel multi-modal framework for migrant integration based on ai tools and digital companion	Specifically targets migrants, addressing their unique integration challenges. Multi-modal framework promises a comprehensive approach. Digital companion provides ongoing support. Aims to "guide and foster the fast integration of migrants, supporting them in the access to assistance, orienting them in meaningful tasks".	Complexity of a multi-modal framework might be challenging to implement and maintain. Cultural sensitivity and language support are crucial for successful migrant integration.
(Satam et al., 2010)	A mentoring chatbot using artificial intelligence framework	Mentoring support. AI framework allows for scalability and automation. Can easily communicate and helps students solve problems. Offers a source for one-to-one mentoring. Mentors aware of student concerns as AI can communicate with them.	Chatbot might lack the empathy and experience of a human mentor. Effectiveness depends on the quality of the AI framework and data used. Potential for biased or generic advice.
(Nguyen Duy Cuong, 2022)	A Personalized career counselling chatbot- ITCareerBot	IT career focus and personalized counseling.	Limited outside of IT, potential lack of general information.
(Gowda et al., 2024)	An AI-based career chatbot: leveraging AI for career counseling	AI-powered career counseling, offering scalability and potentially personalized guidance. Focuses on career counseling, providing support and advice	Chatbot might lack the depth of human counseling. Potential for biased or generic advice.
(Vidhya et al., 2024)	A career mentorship platform using AI-powered recommendations	Platform approach allows for multiple features and resources. AI-powered recommendations provide personalized guidance. Addresses significant needs.	Effectiveness depends on the quality of the AI algorithms and data used. Potential for biased or inaccurate recommendations. Platform usability and accessibility are crucial for user adoption.
(Kumbhar et al., 2023)	A smart model for career guidance using a hybrid deep learning technique	Uses a hybrid deep learning technique, potentially improving accuracy and personalization. Promises a "smart" model for career guidance	Complexity of a hybrid deep learning technique might be challenging to implement and maintain. Potential for overfitting or bias in the model.
(Dr. Kalaivazhi Vijayaragavan et al., 2024)	An NLP-driven chatbot Integrated into career guidance web application	Combines the benefits of a chatbot with the accessibility of a web application. NLP integration allows for more natural and engaging interactions.	Chatbot might lack the depth of human conversation. Web application usability and accessibility are crucial for user adoption.

(Dongre et al., 2021)	Web-based career counselling with chatbot (V-counselling)	The V-Counselling app offers accessible, real-time career guidance using a ChatBot, tailored advice, and potential for future expansions like online courses.	It faces security concerns, over-reliance on automation, limited human interaction, and initial design complexity.
(Raut et al., 2021)	Krishna – a career guidance chatbot	The chatbot offers personalized guidance, addresses common challenges like peer pressure, supports mental health, and provides accessible career information, streamlining decision-making for students	Its guidance may lack depth in certain fields, depends on technology and internet access, risks miscommunication, and lacks the empathy of human interaction.
(Bijotkar et al., 2021)	A Google dialogflow based interview chatbot	Chatbot provides a comprehensive interview experience, covering aptitude, technical, and HR rounds with real-time evaluation for immediate feedback. Its user-friendly design ensures smooth interactions, while unlimited practice helps candidates improve.	It lacks emotional intelligence, limiting personalized interactions, and its rigid questioning may reduce flexibility. The 50% passing score could discourage some users, and a learning curve may exist for less tech-savvy candidates.
(Lokhande et al., 2023)	Conversational intelligent chatbot for Placement service	The chatbot is highly scalable, supporting up to 200,000 users via Firebase. It ensures strong security with multiple authentication methods and secure cloud storage with encryption. NLP capabilities enhance conversational interactions, while personalized job recommendations improve the user experience.	It relies on internet connectivity, limiting access in poor-network areas. Its understanding of complex queries is limited, leading to potential miscommunication. Additionally, ongoing maintenance is required for security and functionality.
(Jain et al., 2023)	A career support platform for older adults powered by AI	Provides tailored career guidance for retirees using Random Forest models and NLP, addressing skills gaps and job opportunities. It aligns with global workforce trends, supporting an aging population and leveraging their expertise.	Accuracy may vary due to diverse retiree aspirations and limited niche data. NLP effectiveness could be hindered by retirees' digital literacy gaps and comfort with AI tools.
(Suresh et al., 2021)	A career counseling chatbot on facebook messenger using AI	The chatbot provides quick responses, understands user intent, and offers tailored resources and job listings. Its automated system reduces the burden on human advisors, and its integration of NLP ensures effective handling of complex queries.	Limited to Facebook users and English language, the chatbot excludes non-Facebook and non-English speakers. Its scalability with concurrent users is untested, and its scope is restricted to select career fields. Additionally, it depends on stable internet connectivity, which may hinder accessibility.

(Reddy et al., 2022)	A whatsapp chatbot for career guidance	Provides accessible, convenient career guidance with fast responses, centralized information, and a user-friendly interface. It uses reliable resources, offering well-rounded insights for career exploration.	Limited input recognition and dependence on predefined code restrict usability. The interface lacks depth compared to manual research, and setup requires significant developer effort.
(Joshi et al., 2024)	An AI career guidance Tool	The AI Career Guidance Tool provides personalized recommendations through machine learning, adapts to job market trends, and leverages advanced technologies like Google's Generative AI API. Its user interaction loop boosts engagement, and its scalable design supports future enhancements.	Integration challenges with Hugging Face models restrict its full potential. It relies on continuous user feedback for improvement and has limited contextual awareness, potentially impacting guidance quality.

III.RESULT

The analysis of the selected peer-reviewed publications revealed a complex interplay of technical, user-centered, and ethical requirements for designing AI-driven conversational models for migrant career guidance. These findings are structured into three overarching themes: technical requirements, user-centered requirements, and ethical considerations. Each theme is discussed in detail below, with supporting evidence from the literature and critical analysis of its implications.

Technical Requirements

The technical requirements form the backbone of any AI-driven conversational model. These include advanced Natural Language Processing (NLP) and Natural Language Understanding (NLU) capabilities to process user queries in multiple languages and dialects, ensuring the system can understand and respond to migrants from diverse linguistic backgrounds (Dhamdhare et al., 2024; Dr. Kalaivazhi Vijayaragavan et al., 2024; Raut et al., 2021). Additionally, the system must leverage machine learning (ML) and deep learning models (such as, GPT, LSTM, RNN, BERT) to provide dynamic, adaptive, and personalized career recommendations based on user interactions and historical data (Kumbhar et al., 2023; Sharma et al., 2024). A context-aware knowledge base is also essential, as it allows the system to dynamically update with real-time data on job markets, industry trends, and educational opportunities, ensuring that the guidance provided is relevant and up-to-date (Nguyen et al., 2022). Furthermore, the system must be integrable with multiple platforms (e.g., WhatsApp, Facebook Messenger, Slack) to ensure accessibility across different devices and applications (Reddy et al., 2022; Suresh et (Reddy et al., 2022; Suresh et al., 2021). Scalability is another critical technical requirement, as the system should be hosted on a scalable cloud infrastructure to handle a large number of users simultaneously, especially during peak times. Finally, the system must include resume parsing and skill mapping capabilities to analyze user profiles and match them with relevant job opportunities, as well as multi-modal interaction support (text, voice, and visual inputs) to cater to users with varying preferences and accessibility needs (Dongre et al., 2021; Prakash et al., 2024).

User-Centered Requirements

User-centered requirements focus on ensuring that the system is accessible, intuitive, and tailored to the needs of migrants. One of the most critical user-centered requirements is multi-language support, as migrants often come from diverse linguistic backgrounds and may not be fluent in the local language (Joshi et al., 2024; Talib et al., 2023). The system should also provide real-time responses to user queries, ensuring low latency and high availability, which is critical for maintaining user engagement and trust (Raut et al., 2021). A user-friendly interface is equally important, especially for migrants who may not be tech-savvy or familiar with AI-driven systems (Dongre et al., 2021; Gowda et al., 2024). The system should also include psychometric assessments and behavioral analytics to provide personalized career guidance based on the user's personality, strengths, and preferences (Santosh Mhatre et al., 2024; Satam et al., 2010). Additionally, the system should support cross-cultural adaptation, taking into account the unique cultural contexts, career expectations, and workplace norms of migrants (Lokhande et al., 2023). User progress tracking is another key requirement, as it allows the system to monitor the user's career development over time and provide continuous, personalized guidance (Bijotkar et al., 2021; Vidhya et al., 2024). Finally, the system should integrate with educational platforms and APIs to recommend skill development resources, such as online courses, certifications, and training programs, helping migrants bridge skill gaps and improve their employability (Martín-Gutiérrez et al., 2020).

Ethical Requirements

Ethical requirements are crucial for ensuring that the AI-driven conversational model operates in a fair, transparent, and responsible manner. One of the most important ethical requirements is data privacy and security. The system must comply with data privacy regulations (e.g., GDPR, CCPA) and ensure secure storage and processing of user data, particularly sensitive information like career history and personal details (Prakash et al., 2024). Migrants may be particularly concerned about data misuse, so transparency in how their data is used is essential. Another ethical requirement is explainability and transparency in the AI model's recommendations. Users should understand why certain career paths or jobs are suggested, which helps build trust in the system (Talib et al., 2023; Vidhya et al., 2024). The system should also be designed to avoid bias and discrimination, ensuring that all users, regardless of their background, receive fair and equitable career guidance (Talib et al., 2023). Additionally, the system should include robust error handling and fallback mechanisms to manage ambiguous or incomplete user queries and provide meaningful responses, ensuring that users are not left without guidance due to technical limitations. Finally, the system should be designed with inclusivity in mind, ensuring that it is accessible to users with disabilities or those who may face barriers to technology access (Martín-Gutierrez et al., 2020).

Interplay of Requirements

The design of an AI-driven conversational model for career guidance for migrants requires a careful balance of technical, user-centered, and ethical requirements. For example, while advanced NLP and ML models are essential for providing personalized recommendations, these technical capabilities must be paired with user-centered features like multi-language support and a user-friendly interface to ensure accessibility (Dongre et al., 2021; Nguyen et al., 2022; Raut et al., 2021). Similarly, while real-time job alerts and dynamic knowledge base updates are critical for providing relevant guidance, these features must be implemented in a way that respects user privacy and avoids bias. The interplay of these requirements highlights the complexity of designing AI systems that are not only technically advanced but also ethical and user-focused (Kumbhar et al., 2023). By addressing these requirements holistically, developers can create a system that effectively supports migrants in navigating new job markets, developing their skills, and achieving their career goals.

IV.DISCUSSION

The study highlights essential requirements for AI-driven career guidance models for migrants. A well-integrated approach is necessary, ensuring technical sophistication aligns with user needs and ethical considerations (Westman et al., 2021). From a technical perspective, NLP, deep learning, and dynamic knowledge bases enhance AI's capability to provide personalized recommendations. However, maintaining accuracy and relevance in fast-changing job markets remains a challenge (Tavakoli et al., 2022). Regular updates and integration with real-time labor market data can mitigate these challenges, ensuring that career guidance remains relevant and adaptive (Kahlawi et al., 2022). User-centered design plays a crucial role in accessibility and usability. Language barriers, unfamiliar job markets, and limited technological proficiency can hinder migrant access to career services (Law et al., 2010). Ensuring multi-language support, intuitive interfaces, and cultural sensitivity improves system effectiveness. Additionally, psychometric assessments and career tracking further personalize the experience, aligning with traditional career counseling practices to provide structured guidance tailored to individual users (Ulate, 2017).

Ethical considerations remain paramount. Issues such as data privacy, bias, and transparency directly impact user trust. While AI has the potential to democratize career guidance, poor implementation can reinforce inequalities (Mujtaba & Mahapatra, 2019). Compliance with data protection laws, such as GDPR and CCPA, and the inclusion of explainability features in AI recommendations are necessary for responsible AI deployment (Kamaruddin et al., 2023). Furthermore, fairness audits and bias mitigation strategies should be incorporated into AI systems to ensure equitable treatment of all users (Roselli et al., 2019). The interplay between these requirements underscores the complexity of AI-driven career guidance development. While advanced AI models can enhance personalization and accuracy, they must be designed in a way that prioritizes user needs and ethical standards (Westman et al., 2021). Future research should evaluate real-world implementations, user experiences, and continuous refinements to ensure AI-driven career guidance remains inclusive, effective, and ethical for migrants (Martín-Gutierrez et al., 2020).

Broader Implications for Research and Practice

The findings of this review have significant implications for both research and practice. For researchers, the review highlights the need for interdisciplinary collaboration between computer scientists, social scientists, and migration experts. Developing AI-driven systems for migrant career guidance requires not only technical expertise but also a deep understanding of the social, cultural, and legal challenges faced by migrants (Leligou et al., 2020). Future research should focus on empirically testing the requirements identified in this review, particularly in diverse host-country contexts. For practitioners, the findings provide a roadmap for designing and implementing AI-driven systems that are both effective and ethical. Policymakers and developers must prioritize user-centered design, ensuring that the system is accessible, culturally sensitive, and easy to use (Bobeth Jan and Schreitter, 2013). They must also establish robust ethical frameworks to guide the development and deployment of these technologies, addressing issues such as bias, transparency, and data privacy.

Societal Impact and Long-Term Considerations

The societal impact of conversational models for migrant career guidance extends beyond individual users. By facilitating labor market integration, these models can contribute to broader economic and social benefits, such as reducing unemployment, addressing skill shortages, and fostering social cohesion (Heimo et al., 2020; Sultana, 2022). However, realizing these benefits

requires careful consideration of long-term implications. For example, while AI-driven models can provide scalable and cost-effective support, they should not replace human career counselors entirely (Natarajan et al., 2022). Instead, they should complement existing services, offering additional resources and support to migrants who may not have access to traditional guidance (Albassam, 2023). Furthermore, the long-term success of these models depends on their ability to adapt to changing labor market conditions and user needs. Continuous evaluation and improvement are essential to ensure the system remains relevant and effective over time.

V.CONCLUSION

In conclusion, this scoping review underscores the multifaceted nature of designing AI-driven conversational models for migrant career guidance. The findings highlight the need for advanced technical capabilities, user-centered design principles, and robust ethical frameworks to create systems that are effective, inclusive, and empowering. By addressing these requirements holistically, researchers and practitioners can develop AI-driven solutions that not only support migrants in navigating their career journeys but also contribute to broader societal goals of social inclusion and economic integration. Future research should build on these findings, exploring innovative approaches to AI design and implementation that prioritize the unique needs and experiences of migrant populations.

REFERENCES

- [1]. Albassam, W. A. (2023). The power of artificial intelligence in recruitment: An analytical review of current AI-based recruitment strategies. *International Journal of Professional Business Review*, 8(6), e02089–e02089.
- [2]. Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32.
- [3]. Beduschi, A. (2022). Migration and artificial intelligence. In *Routledge Handbook of Immigration and Refugee Studies* (pp. 73–81). Routledge.
- [4]. Bijotkar, S., Raul, S., Chitre, V., & Naik, S. (2021). Google Dialogflow based Interview Chatbot. *International Journal of Advances in Engineering and Management (IJAEM)*, 3, 308. <https://doi.org/10.35629/5252-0304308312>
- [5]. Bobeth Jan and Schreitter, S. and S. S. and D. S. and T. M. (2013). User-Centered Design between Cultures: Designing for and with Immigrants. In G. and L. G. and W. J. and W. M. Kotzé Paula and Marsden (Ed.), *Human-Computer Interaction – INTERACT 2013* (pp. 713–720). Springer Berlin Heidelberg.
- [6]. Checketts, L. (2022). Artificial Intelligence and the Marginalization of the Poor. *Journal of Moral Theology*, 11(S11), 87–111.
- [7]. Con\c{t}, M., Ciupe, A., Orza, B., Co\c{t}, I., & Ni\c{t}, G. (2022). Career counseling chatbot using microsoft bot frameworks. *2022 IEEE Global Engineering Education Conference (EDUCON)*, 1387–1392.
- [8]. Dhamdhare, A. Y., Raju Bhosale, N., Joshi, A. C., Kale, V. V., & Chavan, A. A. (2024). ASPIREAI: AI Chatbot for Career Guidance. *International Journal of Innovative Research in Engineering*, 5(2), 254–259. <https://doi.org/10.59256/ijire.20240502033>
- [9]. Dongre, G., Vadraiwalla, F., Upadhyaya, J., & Ghosal, D. (2021). Web Based Career Counselling with ChatBot (V-Counselling). *International Research Journal of Engineering and Technology*. www.irjet.net
- [10]. Dr. Kalaivazhi Vijayaragavan, T. Selvan, R. Sudarsan, & R. K. Sreeraam. (2024). Integrating NLP Chatbot into Career Guidance Web Application. *International Journal of Advanced Research in Science, Communication and Technology*, 198–206. <https://doi.org/10.48175/ijarsct-18035>
- [11]. D'Silva, G., Jani, M., Jadhav, V., Bhoir, A., & Amin, P. (2020). Career counselling chatbot using cognitive science and artificial intelligence. *Advanced Computing Technologies and Applications: Proceedings of 2nd International Conference on Advanced Computing Technologies and Applications—ICACTA 2020*, 1–9.
- [12]. Elalami, M. I., Amin, A. E., & Elsaghier, S. A. (2023). A Real Intelligent Conversation System (Chatbot) to Support Academic Programs in Faculty of Specific Education-Mansoura University. *International Journal of Computer Science Trends and Technology*, 11. www.ijcstjournal.org
- [13]. Gowda, M., Ashneel, I., & Harshik, G. P. (2024). *AI based career chatbot: Leveraging AI for Career Counseling* (Vol. 10).
- [14]. Heimo, S., Tapanila, K., Ojapello, A., & Heikkinen, A. (2020). The Potential of Peer Guidance to Empower Migrants for Employment. *European Journal for Research on the Education and Learning of Adults*, 11, 335–348. <https://api.semanticscholar.org/CorpusID:225189954>
- [15]. Jain, A., Durairaj, S., Paduri, A. R., Krishnan, P., Chalaiah, P., Chanda, J., & Darapaneni, N. (2023). Career Support Platform for Older Adults Powered by AI. *2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC)*, 47–53. <https://doi.org/10.1109/CCWC57344.2023.10099112>
- [16]. Jarupreechachan, W., & Surasak, T. (2023). Developing Healthcare Chatbot: Migrant Workers' Study With Design Implication. *2023 8th International Conference on Business and Industrial Research (ICBIR)*, 495–500.
- [17]. Joshi, K., Raut, A., Raut, R., Raut, A., Raut, N., Raut, S., & Raut, P. (2024). *AI Career Guidance Tool*. <https://doi.org/10.1109/ICPIDS65698.2024.00046>
- [18]. Kahlawi, A., Giambona, F., Buzzigoli, L., Grassini, L., & Martelli, C. (2022). Can A Recommendation System Manage the Labour Market? *2022 International Joint Conference on Information and Communication Engineering (JCICE)*, 75–79. <https://doi.org/10.1109/JCICE56791.2022.00026>
- [19]. Kamaruddin, S., Mohammad, A. M., Saufi, N. N. M., Rosli, W. R. W., Othman, M. B., & Hamin, Z. (2023). Compliance to GDPR data protection and privacy in artificial intelligence technology: Legal and ethical ramifications in Malaysia. *2023 International Conference on Disruptive Technologies (ICDT)*, 284–288.
- [20]. Kotiyal, S., Thakker, D., & Dubal, Y. (2022). Knowledge Graph based Intelligent Conversational Agent for UK Immigration Case Work. *NLIWoD@ ESWC*, 1–8.
- [21]. Kumbhar, V. R., Maddel, M. M., & Raut, Y. (2023). Smart Model for Career Guidance Using Hybrid Deep Learning Technique. *1st IEEE International Conference on Innovations in High Speed Communication and Signal Processing, IHCSP 2023*, 327–331. <https://doi.org/10.1109/IHCSP56702.2023.10127152>
- [22]. Kuneva, L., & Hough, K. L. (2023). Fostering inclusion for refugees and migrants and building trust in the digital public space. *Transforming Government: People, Process and Policy*, 17(3), 412–423.

- [23]. Landolt, S., & Thieme, S. (2018). Highly skilled migrants entering the labour market: Experiences and strategies in the contested field of overqualification and skills mismatch. *Geoforum*, 90, 36–44.
- [24]. Law, C. M., Jaeger, P. T., & McKay, E. (2010). User-centered design in universal design resources? *Universal Access in the Information Society*, 9(4), 327–335. <https://doi.org/10.1007/s10209-009-0182-z>
- [25]. Leligou, H. C., Anastosopoulos, D., Montagna, A., Solachidis, V., & Vretos, N. (2020). Embracing Novel ICT Technologies to Support the Journey From Camp to Job. 2020 *IEEE International Conference on Multimedia & Expo Workshops (ICMEW)*, 1–6. <https://doi.org/10.1109/ICMEW46912.2020.9106035>
- [26]. Lokhande, S., Goregaonkar, P., & Vinchu, K. (2023). Conversational Intelligent Chatbot for Placement Service. *International Journal of Innovative Research in Engineering*, 581–585. <https://doi.org/10.59256/ijire.2023040230>
- [27]. Mak, S., & Thomas, A. (2022). Steps for conducting a scoping review. *Journal of Graduate Medical Education*, 14(5), 565–567.
- [28]. Martín-Gutiérrez, D., Hernández-Peñaloza, G., Semertzidis, T., Moreno, F., Lazaridis, M., Álvarez, F., & Daras, P. (2020). A Novel Multi-Modal Framework for Migrants Integration Based on AI Tools and Digital Companion. 2020 *IEEE International Conference on Multimedia & Expo Workshops (ICMEW)*, 1–6. <https://doi.org/10.1109/ICMEW46912.2020.9106023>
- [29]. McTear, M. (2022). *Conversational ai: Dialogue systems, conversational agents, and chatbots*. Springer Nature.
- [30]. Mujtaba, D. F., & Mahapatra, N. R. (2019). Ethical considerations in AI-based recruitment. 2019 *IEEE International Symposium on Technology and Society (ISTAS)*, 1–7.
- [31]. Natarajan, H., Jos, D., Mahadi, O., & Shahare, Y. (2022). Career Advisor Using AI. In *Emerging Technologies in Data Mining and Information Security: Proceedings of IEMIS 2022, Volume 3* (pp. 511–517). Springer.
- [32]. Nguyen, D. C., Dinh, N. H. D., Pham-Nguyen, C., Le Dinh, T., & Nguyen Hoai Nam, L. (2022). ITCareerBot: A Personalized Career Counselling Chatbot. *Communications in Computer and Information Science*, 1716 CCIS, 423–436. https://doi.org/10.1007/978-981-19-8234-7_33
- [33]. Nguyen Duy Cuong, D. N. H. D. P.-N. C. L. D. T. N. H. N. Le. (2022). ITCareerBot: A Personalized Career Counselling Chatbot. In K. and N. S. V. and P. M. and K. M. Szczerbicki Edward and Wojtkiewicz (Ed.), *Recent Challenges in Intelligent Information and Database Systems* (pp. 423–436). Springer Nature Singapore.
- [34]. Ohm, A., & K, B. (2019). Chatbot for Career Guidance Using AI. *International Journal of Computer Sciences and Engineering*, 7(6), 856–860. <https://doi.org/10.26438/ijcse/v7i6.856860>
- [35]. Prakash, S., Sundar, K., Manohar, E., & Prakash, R. (2024). CAREER CONNECT-A Personalized Job Recommendation AI Chatbot. <https://ssrn.com/abstract=5035946>
- [36]. Přivarová, M. (2020). EMPLOYMENT AS AN INDICATOR OF IMMIGRANTS INTEGRATION IN A HOST SOCIETY. *The EURASEANS: Journal on Global Socio-Economic Dynamics*, 5 (24), 48–55.
- [37]. Raut, R., Sharma, R., & Kharbade, R. (2021). Krishna-The Career Guidance ChatBot. *International Research Journal of Engineering and Technology*. www.irjet.net
- [38]. Reddy, V. M. N., Reddy, S. M., Vamshi, A. Y., Reddy, K. N., Dhanunjay, B., & Gopal, S. V. (2022). WHATSAPP CHATBOT FOR CAREER GUIDANCE. *International Research Journal of Engineering and Technology*. www.irjet.net
- [39]. Roselli, D., Matthews, J., & Talagala, N. (2019). Managing Bias in AI. *Companion Proceedings of The 2019 World Wide Web Conference*, 539–544. <https://doi.org/10.1145/3308560.3317590>
- [40]. Santosh Mhatre, M., Anil Chaudhari, K., Vijay Jadhav, A., & Ashok Sathe, V. (2024). EDU COUNSELOR: CAREER COUNSELING CHATBOT. In *International Journal of Engineering Applied Sciences and Technology* (Vol. 8). <http://www.ijeast.com>
- [41]. Satam, S., Nimje, T., Shetty, S., & Kurle, S. (2010). *Mentoring Chatbot using Artificial Intelligence Framework*.
- [42]. Sharma, A., Kumaar, A., Mishra, K., Mishra, U., & Agarwal, R. (2024). CAREER GUIDANCE AND ROADMAPS TO SUCCESS USING GPT-MODEL. 79–84. <https://doi.org/10.55524/csistw.2024.12.1.14>
- [43]. Sultana, R. G. (2010). Career guidance and social inclusion: A challenge for Europe. *Australian Journal of Career Development*, 19(1), 18–23.
- [44]. Sultana, R. G. (2022). The labour market integration of migrants and refugees: career guidance and the newly arrived. *International Journal for Educational and Vocational Guidance*, 22(2), 491–510. <https://doi.org/10.1007/s10775-022-09529-z>
- [45]. Suresh, N., Mukabe, N., Hashiyana, V., Limbo, A., & Hauwanga, A. (2021). Career Counseling Chatbot on Facebook Messenger using AI. *ACM International Conference Proceeding Series*, 65–73. <https://doi.org/10.1145/3484824.3484875>
- [46]. Susar, D., & Aquaro, V. (2019). Artificial intelligence: Opportunities and challenges for the public sector. *Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance*, 418–426.
- [47]. Talib, A., Housni, M., & Radid, M. (2023). Utilizing M-Technologies for AI-Driven Career Guidance in Morocco: An Innovative Mobile Approach. *International Journal of Interactive Mobile Technologies*, 17(24), 173–188. <https://doi.org/10.3991/IJIM.V17I24.44263>
- [48]. Tavakoli, M., Faraji, A., Vrolijk, J., Molavi, M., Mol, S. T., & Kismihók, G. (2022). An AI-based open recommender system for personalized labor market driven education. *Advanced Engineering Informatics*, 52. <https://doi.org/10.1016/j.aei.2021.101508>
- [49]. Tejwani, R., Katz, B., & Breazeal, C. (2022). Migratable AI: Personalizing Dialog Conversations with Migration Context. *International Conference on Social Robotics*, 89–99.
- [50]. Tountopoulou, M., Vlachaki, F., & Triantafillopoulou, M.-E. (2021). Universal Skills Framework for Migrants, Asylum Seekers and Refugees-A Mapping on the Required Skills While Entering the European Labour Market. *Int'l J. Soc. Sci. Stud.*, 9, 34.
- [51]. Ulate, J. J. (2017). Career Counseling: A Bibliographical Framework and Contribution for Employment Companies and Employees. *Revista Electrónica Educare*, 21(2), 397–413.
- [52]. Vidhya, P., Divyanka, S. P., Sangavi, S. A., Santhoshini, A., & Kumarasamy, M. (2024). Career Mentorship Platform Using AI-Powered Recommendations. *IJIRT 169900 INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY*, 2807.
- [53]. Wanner, L., Klusch, M., Mavropoulos, A., Jamin, E., Marín Puchades, V., Casamayor, G., Černocký, J., Davey, S., Domínguez, M., Egorova, E., & others. (2021). Towards a versatile intelligent conversational agent as personal assistant for migrants. *Advances in Practical Applications of Agents, Multi-Agent Systems, and Social Good. The PAAMS Collection: 19th International Conference, PAAMS 2021, Salamanca, Spain, October 6–8, 2021, Proceedings 19*, 316–327.
- [54]. Westman, S., Kauttonen, J., Klemetti, A., Korhonen, N., Manninen, M., Mononen, A., Niittymäki, S., & Paananen, H. (2021). Artificial Intelligence for Career Guidance—Current Requirements and Prospects for the Future. *IAFOR Journal of Education*, 9(4), 43–62.