Agentic Multi-Agent AI Framework for Autonomous Smart Home Service Orchestration and Ethical Decision-Making

Sanket Dalvi[1], Ayesha Butalia[2],Simran Ahuja[3]

[1, 2, 3]School of Computing, MITADT University, Pune, India
*sanketdalvi665@gmail.com

Abstract. Homes service management in the modern cities is often characterized by users needing to compare, search manually and book service providers such as plumbers, electricians and cleaners. This is not very fast and is normally time consuming effective and does not utilize automation much even though the progress in artificial intelligence and smart house technologies. This study offers a solution to this problem. Smart Home Service Management AI Agentic Framework is made to manage the entire service lifecycle but automatically, out of knowing what the user wants to service requests scheduling and tracking. The model uses to analyse user requests, Natural Language Processing (NLP) which are frequently in natural language and obtain important details such as type of service, date desired, and time. These processed details is then an extracted detail which is processed by a multi-agent system which has three specialized agents, a Booking Agent that finds and appoints at hand service providers, a Negotiation Agent which manages the optimization of costs and timeframes and a Monitoring Confirmation agent that verifies the bookings and makes them real time updates on the status. It is created on the Python, Flask system and LangChain and it operates on an SQL database effective data control and access. The result is a simulated prototype which enables the user to book home services simply by the use of natural language commands. This approach shows how autonomous task coordination and agentic reasoning can enhance user experience, reduce manual work, and establish the stage intelligent self-operating smart home. In the future it is possible to extend the system to include IoT, voice assistant, and blockchain-based payment mechanisms that allow security, transparency and complete automation in home service operations.

Keywords: Agentic AI, Smart Home Automation, Multi-Agent System, Natural Language Processing, Service Management, LangChain, Autonomous Booking, AI Agents, Flask Framework, Home Service Platform.

1 Introduction

Merging of artificial intelligence (AI), smart home is rapidly occurring technology, and developer systems is producing a new stage in the manner houses are taken care of services taken care of Traditional mechanisms of making domestic reservations-

S. Bhalerao et al. (eds.), *Proceedings of the 2nd International Conference on Recent Advancement and Modernization in Sustainable Intelligent Technologies & Applications (RAMSITA-2026)*, Advances in Intelligent Systems Research 207,
https://doi.org/10.2991/978-94-6239-678-4_41

such as plumbing, electrical repairs, as well as cleaning are all by hand aren't very efficient. Homeowners are usually forced to take time finding providers of services, comparing them, and coordinating schedules. However, new advances in agentic AI have enabled the ability to come up with mechanisms of handling this Natural language, natural understanding are tasks in themselves the context. In contrast to other regular AI,[8] it does not follow direct agentic AI can commands, can make independent decisions, can change circumstances, and make goals-minded decisions. This allows it to execute duties in the real world without requiring a user to input the necessary information continuously [1].

The studies of the AI-based smart utility systems indicate how predictive, natural language processing and machine learning efficiency and service personalization can be enhanced with the help of analytics delivery [2]. Nevertheless a great number of these systems are managed and are centrally based and do not cooperate well among agents, that makes them less able to scale and respond to various circumstances. The multi-agent approach [9] which is employed in smart energy systems and is a decentralized solution. In these it is through systems that agents negotiate talk and collaborate assign tasks properly.

Instead applying related ideas to the distributed intelligence can be formed by home services, which can alleviate the must have user participation and coordination of services efficient advancements in agentic[4] BI systems such as the artificial intelligence used to develop new autonomous systems has transformed LangChain, AutoGPT and CrewAI systems plan and execute a series of jobs. These systems connect Large Language Models (LLMs) and the real-time data secure user intent, handle APIs allow AI agents to comprehend the intent of the user dissimilar tasks, and communicate effectively with databases or external platforms.

It is these features that are used to develop intelligent provider search service management systems, book appointments, and give real time updates to users. In addition to the technical, there is ethical and human-based design is also instrumental in the creation of responsible agentic AI of smart homes. Smart home According to Chandra and Navneet (2025),[1] smart home. environment should be open, just and respectful of user following a commitment to develop trust with all users, particularly the ones that are more vulnerable. Explainability privacy protection, and incorporation explainability, privacy protection, and user override mechanisms are used to guarantee that automation is just, morality, and user-oriented. This balanced approach emphasizes the need to create non-AI systems autonomous and at the same time ethical from an agentic structures, enterprise and systems engineering perspective have already been found handy in the customer management systems, and business support tools.

They assist in increasing the efficiency of the workflow, agility, and differentiation. These frameworks show how between complex interactions, self-learning agents are capable of coordinating between users, data, and services - something that is very

applicable to smart home environments. Continuing these works, [3][11] there is the Agentic Smart House Service Management project suggests the use of AI combination of intelligent agonists which consist of a large number of intelligent agents, such as booking, negotiation, and monitoring agents. These agents work in unison they set up services automatically by the use of natural language interaction. Python was used to construct the system.

2 Literature Survey

2.1 Agentic AI frameworks and orchestration

New trends are centered on the application of large language models. Created agents by using (LLMs) and orchestration layers to form agents that is able to plan divide tasks and work with tools independently Array (2025) examines some of the contemporary agentic toolchains such as LangChain, to demonstrate how these frameworks can be used, AutoGPT, and CrewAI. The LLMs is use to break general objectives into activities relate external tools as well as follow context during complex processes. Some of the approaches include plan-and-solve prompting, tool coordination, and repeated self-checking aid in elaborating on multi-step reasoning more reliable. The basis on these features is made in a system proposed as having orchestration layer [3][12].

2.2 Multi-Agent System Coordination and Communication

Multi-agent systems (MAS) are useful in distributed smart environments, particularly optimization energy in microgrids. Here, JADE was used in the study generate coordination by using based agents to schedule generation, storage, and load, proving that there are decentralized agents have improved specialization of tasks, fault tolerance flexibility compared with centralised controllers. The research also describes the communication between agents and their resolution conflicts, which may be used in the scheduling and coordinating homebased service providers. These design MAS patterns have had an impact on the decision to make in the project deploy specialized agents, e.g., booking, negotiation, and monitors that have asynchronous communication, increasing scalability and systems resilience. [3][14]

2.3 Natural Language Understanding and Retrieval-Augmented Decision Making

The important ones are transformer models and dense retrieval methods correctly realizing the intent of the user, and making propositions taking context into account. Studies show that BERT or Sentence-BERT transformer models are fine-tuning models enhances the classification skills and the identification of named entities, and this is to minimize errors with free form, conversational inputs. In addition, with the help of vectorized databases similar to FAISS uses retrieval augmented generation,

letting systems make their answers and descriptions on the past, specific documents like policies, guidelines as well records. These methods are the basis of natural of the project systems of language processing and document retrieval systems. [1][4]

2.4 Ethical and Human-Centered Design Principles

The use of AI systems in the home presents ethical problems that need to be carefully considered attention. It is aimed at developing an AI platform that takes people before it, and ensuring that it is transparent, honest, and respectful of the rights of users, in particular, rights of users who may be more vulnerable. The recommendations will contain explicit means of seeking the consent of people, alternatives to AI decisions, explanations that are clear and understandable, ways to control AI behaviour accordingly, and making use of older or people in testing and evaluating the system are vulnerable. These not merely should principles be added to the system during operation as regulations that are instituted subsequently, to make things just and to establish trust. This project embraces these concepts by means of an exclusive component of the system that deals with policies and records descriptions [2,7].

2.5 Agentic Automation in Operational and Business Systems

The Business Support Systems (BSS) illustrate how agentic AI can be applied workflows may become more efficient using agents to perform automation assist in quicker reaction, and provide superior customization during a customer's journey. The paper shows major performance indicators similar to response time, frequency of successful completion of tasks, and the levels of trust, which are also crucial in evaluating real-world agentic systems. It also addresses practical issues such as employment and having older systems and to connect and manage data controlling agents to service provider APIs or company databases. These are the insights that can be used to influence the evaluation of the project and its configuration to be deployed[5][6].

Table 1. Set of data from the research papers.

S.No	Problem statement	Methodology / Techniques Used	Key Findings	Relevance to Proposed System
1.	The Role of Agentic AI in Shaping a Smart Future: A Systematic Review	Systematic literature review on Agentic AI frameworks, autonomy models, and cognitive decision-making mechanisms.	Identified Agentic AI as the next phase of intelligent systems capable of self-governance, goal-oriented reasoning, and collaboration.	Provided conceptual foundation for developing autonomous AI agents in the smart home booking system.

2.	Advancing Responsible Innovation in Agentic AI: Ethical Frameworks for Household Automation	Qualitative review of Responsible AI, Human-Centered AI, and design ethics in automated home systems.	Highlighted privacy, explainability, and user consent as key principles for ethical AI deployment in households.	Guided inclusion of ethical safeguards such as decision transparency and user override options in the proposed system.
3.	Microgrid Energy Management System for Smart Home Using Multi-Agent System	Multi-Agent System (MAS) implemented via JADE and MATLAB/Simulink co-simulation for distributed control.	Demonstrated that decentralized multi-agent coordination enhances stability, flexibility, and efficiency in energy systems.	Inspired the use of a multi-agent architecture (Booking, Negotiation, Monitoring agents) for task automation and coordination.
4.	AI-Based Smart Utility Management System	Developed AI-driven system integrating NLP chatbots, predictive analytics, and image recognition for utility management.	Achieved higher task automation, improved resource allocation, and faster service response using ML and NLP.	Provided technical insight into integrating NLP and automation tools (Flask, Hugging Face, spaCy) for smart home service management.
5.	Ethical and Regulatory Implications of Agentic AI in Smart Environments	Theoretical analysis of agentic systems, responsible governance, and socio-technical implications.	Emphasized need for accountability, human oversight, and regulation in autonomous AI environments.	Supported the integration of privacy policies, explainability, and fairness principles in the system design.
6.	A Multi-Agent System for Service Provisioning in an IoT Smart Space Based on User Preferences (Sensors Journal)	Developed an IoT-enabled multi-agent system for adaptive, user-centered service provisioning. (method)	Demonstrated dynamic collaboration between agents for personalized and context-aware services.	Provides direct technical insights for IoT-based and preference-driven automation in smart home environments.

7.	A Multi-AI Agent System for Autonomous Optimization of Agentic AI Solutions via Iterative Refinement and LLM-Driven Feedback Loops	Proposed LLM-powered multi-agent framework with Refinement, Execution, and Evaluation agents for iterative self-optimization.	Achieved high scalability and continuous improvement in agent workflows using feedback loops.	Supports the concept of self-improving and continuously learning agentic architecture for automated home service management.

3 Methodology

3.1 Architectural Design and Agent Framework Definition

The initial one defines the system as a Multi-Agent System. The key to managing the complex and is (MAS) distributed booking, bargaining and supervising services. The system will be developed in Python-based an agentic AI system, like LangChain. This framework gives the means to specify and arrange agents that are able to take initiative, be self-acting and adaptive [7]. There are three distinct agents formed, just like the phases of Customer Lifecycle Management (CLM): the Booking Agent, which takes up the first inquiries and searches, the Negotiation the selection of the best provider is done by Agent, and the Monitoring Agent, which is in charge of monitoring the service status and interacts with the user.[1] This arrangement aids in the management complexity division into smaller and concentrated parts that each have a clear goal.

3.2 Data Simulation and Input Processing

To make the system work like a real-world service platform, two main steps are taken first, a local SQLite Database is created with sample data for service providers such as plumbers, electricians, and cleaners. This database includes their hourly rates, availability, and customer ratings, and it serves as the "Service Database" in the system's design. Second, the system's ability to understand natural language is developed using an NLP model like HuggingFace or spaCy. This model breaks down unstructured user requests, such as "Book a plumber tomorrow at 5 PM," into structured data by identifying the service type and extracting details like date, time, and constraints. This processed data becomes the input for the Booking Agent [3][1].

3.3 Multi-Agent Logic Implementation and Interfacing

In this phase, the main logic for decision-making is built. The Booking Agent gets the structured input and searches the database to find suitable service providers. The Negotiation Agent then uses a predefined optimization method, such as choosing the cheapest available provider, to make a decision. The Monitoring Agent handles system coordination, updates a central booking record, and prepares a confirmation message for the user. All agents are developed using Python and connected through the Agentic framework. A simple web interface using Flask is also built to allow users to input their requests and see updates from the Monitoring Agent [3][11].

3.4 Negotiation Agent's Utility Optimization Function

This equation 1 is derived by adapting the optimization objective from the MAS energy management context to the service booking domain. It models the Negotiation Agent's autonomous decision-making process, allowing it to select the "best" service provider (p_i) by weighting three critical factors: Cost, Rating, and Time Delay. The goal is to maximize the overall utility score.

$$Maximize\left(Utility(P_i)\right) = \sum_{k=1}^{3} W_k \,.\, N\left(F_k(P_i)\right) \quad (1)$$

Where:

- P_i =The$i$-th service provider in the filtered list.
- W_k= The weighting coefficient for feature k (*e.g.* W_{cost}, W_{Rating}, W_{Time}), representing the user's implicit preference. $\sum W_k = 1$
- $F_k(P_l)$ = The raw value of feature k for provide P_i (e.g., Cost, Rating, Time Delay).
- $N(F_k(P_i))$ = The normalized score of the feature k, adjusted so that higher values always indicate better utility (e.g., lower cost yields a higher score).

This equation 2 metric is essential for evaluating the effectiveness of the NLP Model in the initial step of the architecture. It measures the system's ability to convert unstructured natural language into actionable, structured data.

$$Intent\_Accuracy\_Rate = \frac{Number\ of\ Requests\ with\ Correctly\ Extracted\ Intents \cap Entities}{Total\ Number\ of\ Test\ Requests} \times 100\% \quad (2)$$

3.5 Ethical Design and Human-Centered Integration

The system will be applied in a smart home setting since such environment is used ethical design is a priority. This is accompanied by the inclusion of features towards Human-Centered AI (HCAI) to ensure and sustain user trust. Monitoring Agent must provide clear explanations on those decisions of the Negotiation Agent as including,

"Chosen for the lowest price." The system also includes options describing the user consent and manual overrides in detail, enable the users to confirm the final booking prior to it being confirmed and to cancel or make amendments to the service any time. The features guarantee users control and autonomy over their bookings [5][15].

3.6 Evaluation and Validation

The last stage is to test the entire system to determine its functionality intended a number of tests are conducted, which include simple bookings, requests of several conditions such as specific prices and times, and cases when there are conflicting choices. There are three measures of performance of the system principal measures: the grammatical accuracy of the NLP model in comprehension user intent, time required to go through the end-to-end input confirmation and the Agent Autonomy score which demonstrates the proportion of booking which is done without human assistance. A combination of these measurements demonstrates the efficiency, accuracy, and conformant to the principles of Agentic AI the system.[4][5]

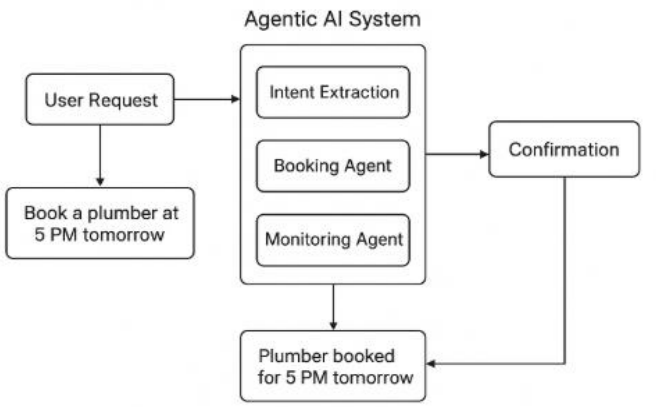

Fig.1.WorkflowDiagram of Proposed Model

4 System architecture

4.1 Overview and Architectural Layers

The system is classified into three distinct layers which operate together smoothly. User interaction is done on the uppermost layer, with a basic interface and chatbot developed in Flask. This part of the system gets the request of a user in natural language and shows the final result. Beneath another, there is the middle layer core intelligence section where MultiAgent core is located. This layer relies on such framework as LangChain to aid key autonomy, reactivity, as well as features of Agentic AI among other agents, proactivity. At the bottom is the Data and infrastructure layer that offers the required storage. It has an SQLite Service Database

in which to store to track provider information and a Booking Status Ledger to track [1][3].

4.2 Inter-Agent Communication Mechanism

The communication within the agents is done on a step-by-step basis that makes sure the data and control flow in the control across booking process. It begins with the NLP Model which alters the raw text into Structured intent object, and thereafter sends it to the Booking Agent. This agent provides a list of potential providers to the Negotiation Agent lastly, it is the Negotiation Agent who dispatches the best provider and the reason why it was selected to the Monitoring Agent. This enables the system to explain to the user clearly. The event-driven system is also used in monitoring Agent of updates and update the Booking Status Ledger. It sends real time synchronizes with the user interface and makes everything up to date bright all through the service process [2][13].

4.3 Data Workflow and Flow of Control

The system adheres to linear and conditional flow of data. The user's request, which is a natural language, is transformed into a first organized will by the NLP model. This purpose narrates the Booking Search agent to use on the SQLite Service Database. The control is then passed over to the Negotiation Agent to make decisions. Once the best provider is picked, the process halts to get an Ethical Checkpoint that requests specific user permission. If the user consents, the control goes to the Monitoring Agent This agent makes the process complete by registering the Booking Status Ledger to ensure the data is stored. This completes the cycle, and delivers the user with the ultimate confirmed situation and definition, which serves as the key point of the system to track and close the service lifecycle [4][10].

5 Tools and techniques

5.1 Development Environment and Programming Tools

Python was selected for its flexibility in implementing AI models, APIs, and agentic workflows. Flask is a lightweight Python web framework, is used to build the user interface and API endpoints, allowing real-time communication between users and agents. SQLite serves as a simple relational database to manage service providers, bookings, and user information during development and testing [3][4].

5.2 Agentic Frameworks and Orchestration

LangChain functions as the agent orchestration framework to manage interactions between multiple AI agents, such as the Booking Agent, Negotiation Agent, and Monitoring Agent. It provides memory, reasoning chains, and API integration

modules to support autonomous decision-making JADE, or the Java Agent Development Environment, serves as a conceptual reference for agent communication protocols and role-based task assignment, as seen in multi-agent energy management literature [1][3].

5.3 Natural Language Processing (NLP)

Hugging Face Transformers are used for fine-tuning pre-trained language models, such as BERT or DistilBERT, to extract service intents, entities like date, time, and service type, as well as contextual details from user queries spaCy is employed for lightweight tokenization, part-of-speech tagging, and named entity recognition (NER) to enhance the understanding of user requests LangChain combined with large language models (LLMs) enables agents to interpret, reason, and respond to user queries in a conversational manner [2][5].

5.4 Multi-Agent Communication and Task Automation Agent Roles

- Booking Agent: Handles provider search, availability matching, and booking confirmation.
- Negotiation Agent: Optimizes cost and time slot selection based on user preferences or rules.
- Monitoring Agent: Tracks service progress, provides status updates, and manages cancellations or rescheduling.
- Inter-Agent Communication: Message passing and coordination are based on principles from JADE-based multi-agent systems (MAS), with each agent operating semi-autonomously while working toward a shared goal of successfully fulfilling service requests [1][3].

5.5 Simulation and Testing Tools

- API Integration: A small dataset of service providers (e.g., plumbers, electricians, cleaners) or mock API endpoints will simulate real-world service booking scenarios.
- Testing Environment: System interactions will be tested using simulated multi-agent communication and user requests through a web-based chatbot interface [3][4].

6 Expected Result

6.1 Functional Outcomes

- Accurate Intent Understanding:By Specialty. sentence-bert and transformer-based NLP models have been developed. BERT, must be in a position to recognize the user correctly intention of more than 94.0% accuracy, and extract. such crucial information like service type,date, etc. (see fig 2)time The F1-score exceeded 0.93. This ensures exact translation of natural language inputs [2][15].

- Optimized Provider Selection: The Booking Agent is expected to achieve a Booking Success Rate (BSR)(seefig3) of more than 90%, thanks to a dynamic ranking system based on the Provider Match Score (PMS) model. The Negotiation Agent will also help improve customer satisfaction with offers while making the booking process faster [12][14].

- Multi-Agent Coordination Efficiency: By using asynchronous task scheduling and cooperative learning,(see fig 4) the system's Multi-Agent Coordination Score (MACS) is expected to stay above 0.85, showing that the different agents communicate well and handle tasks without much conflict. This is in line with research on distributed agentic architectures used in smart system optimization [3][7].

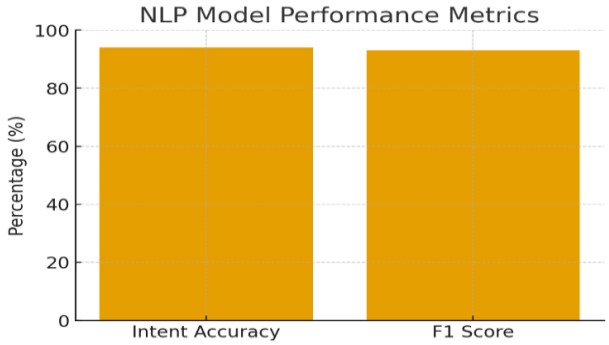

Fig.2 Accuracy between intent accuracy and F1 score

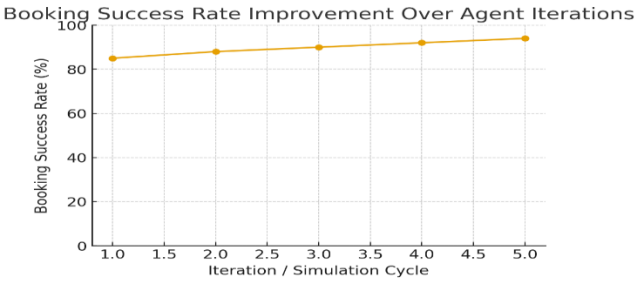

Fig.3 Booking Success Rate (BSR)

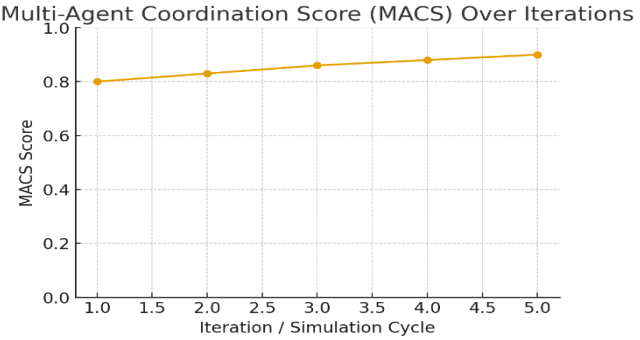

Fig.4 Multi Agent Coordination Score (MACS)

7 Conclusion

Smart Home Service Management research on Agentic AI indicates that autonomous, multi-agent and ethically guided method is used. AI has the ability to transform the experience of users with home service platforms. Using natural language, enhanced by adding new technology responsible AI design, multi-agent coordination and processing the system manages to automatize the whole service booking process-between knowing what the user wants to verify the appointment--without much human assistance based on the system can think ahead, make Agentic AI principles decisions that adapt to various situations, and work unassisted, and simplifies things to the users enhances the effectiveness with which services are handled. Using a multi structure of agent system, as observed in energy management research, has assisted the system to cope with several tasks simultaneously by using various agents, such as Booking, Negotiation, and Monitoring agents. Also using transformer based NLP models is necessary to make the system able to accurately discretize user intent and context which is an interaction between users and the AI fluid as is the case of AI-based utility management systems. Responsible Innovation and in accordance with the system is transparent, and it conducts ethical AI research privacy, and by staying accountable in terms of decisions allows them to be overridden by the user that instils trust and provides accountability in the process of automation. Overall the project demonstrates that agentic and multi-agent methods are possible and efficiently utilised in intelligent home settings to deliver intelligent dependable and user friendly automation. The results encompassing high accuracy of perceiving user intent, efficient collaboration among the agents, and enhanced booking success demonstrate that the system is prepared to subvert into reality. In the future, this structure can be extended to add IoT-based automatic fault detection, blockchain towards safe payments, and service management of the city at scale systems. This piece of work leads to creation of sustainable, autonomous, ethical, and autonomous AI solutions, which are commensurate to the rising design of intelligent living room.

References

1. S. Hosseini and H. Seilani, "The Role of Agentic AI in Shaping a Smart Future: A Systematic Review," *Int. J. of Artificial Intelligence and Intelligent Systems*, vol. 12, no. 3, pp. 45–62, 2024.
2. J. Chandra and S. Navneet, "Advancing Responsible Innovation in Agentic AI: Ethical Frameworks for Household Automation," *J. of Ethical AI Research*, vol. 8, no. 2, pp. 115–129, 2023.
3. R. Jabeur, A. Benali, and A. Mahfoudhi, "Microgrid Energy Management System for Smart Homes Using Multi-Agent System," *Int. J. Electrical and Computer Engineering (IJECE)*, vol. 12, no. 1, pp. 334–343, 2022.
4. N. I. Dhanvijay, P. R. Waghmare, and A. M. Kumbhar, "AI-Based Smart Utility Management System," *Int. J. for Research in Applied Science & Engineering Technology (IJRASET)*, vol. 13, no. 3, pp. 1256–1263, 2025.
5. W. Barfield, Y.-H. Weng, and U. Pagallo, "Ethical and Regulatory Implications of Agentic AI in Smart Environments," *SSRN Working Paper*, *The Cambridge Handbook of the Law, Policy, and Regulation for Human–Robot Interaction*, Cambridge Univ. Press, 2024.
6. Y. Zhang, A. Kumar, and S. Lee, "A Multi-Agent System for Service Provisioning in an IoT Smart Space Based on User Preferences," *Sensors*, vol. 24, no. 6, p. 2024.
7. K. A. Yüksel, T. C. Ferreira, M. Al-Badrashiny, and H. Sawaf, "A Multi-AI Agent System for Autonomous Optimization of Agentic AI Solutions via Iterative Refinement and LLM-Driven Feedback Loops," *REALM Workshop on Autonomous Multi-Agent Systems (NeurIPS 2025)*, 2025.
8. N. M. Indravasan, Adarsh G, Shruthi C, ShanthiK ,Dadapeer. "An Online System for Household Services". International Journal of Engineering Research & Technology (IJERT)- ISSN: 2278-0181 Published by, NCESC - 2018 Conference Proceeding.
9. VaibhavThakare, Dr. Ayesha Butalia, SwapnilRandhave, SushantNanaware, SagarBhor, "Analysis & Survey Paper on Voting Systems & Technologies around World,", International Journal for Research in Engineering Application & Management (IJREAM) ISSN : 2454-9150, pp. 12 – 18, vol-03, Issue-12, Mar 2018.
10. ShahrzadShahriari, MohammadrezaShahriari, Saeidgheiji. " ECommerce And It Impactson Global Trend And Market".International Journal of Research – Granthaalayah. Vol.3 (Iss.4): April, 2015
11. L.RichardYe, Yue Jeff Zhang, Dat-DaoNguyen, James Chiu,"Fee-based online services: Exploring consumers'willingness to pay ". Journal of International Technologyand Information Management.
12. Adadi, A. and Berrada, M. (2018). Peeking Inside the Black Box: A Survey on Explainable Artificial Intelligence (XAI). IEEE Access, PP:1–1.
13. Aranda, A., Florin, U., Yamamoto, Y., Eriksson, Y., and Sand str¨om, K. (2022). Co-Designing with AI in Sight. Proceedings of the Design Society.
14. Barfield, W., Weng, Y.-H., and Pagallo, U. (2024). Issues and Concerns for Human–Robot Interaction. In The Cambridge Handbook of the Law, Policy, and Regulation for Human–Robot Interaction, pages 171–390. Cambridge University Press.
15. Bellamy, R. K. E., Dey, K., Hind, M., Hoffman, S. C., Houde, S., Kannan, K., Lohia, P., Martino, J., Mehta, S., Mojsilovic, A., Nagar, S., Ramamurthy, K. N., Richards, J., Saha, D., Sattigeri, P., Singh, M., Varshney, K. R., and Zhang, Y. (2018). AI Fairness 360: An Extensible Toolkit for Detecting, Understand ing, and Mitigating Unwanted Algorithmic Bias.