

Streamlining Customer Communication through AI-powered Chatbots in Travel Agencies

Mr. Manas Bhole

PG Scholar

Department of Master of Computer Application,
G H Raisoni University, Amravati, India

Received on: 11 May, 2024

Revised on: 18 June, 2024

Published on: 29 June, 2024

Abstract: The Travels Management System (TMS) is a comprehensive solution designed to optimize travel operations for both travelers and administrators. It offers an intuitive interface accessible via web and mobile platforms, allowing for easy booking and reservation management. TMS simplifies expense tracking by consolidating all travel-related expenses in one place, enabling administrators to generate detailed reports to analyze travel expenditure and identify cost-saving opportunities. It also helps enforce travel policies by providing alerts and notifications when bookings fall outside established guidelines, ensuring adherence to company policies and budgetary constraints. TMS offers seamless integration with third-party systems, enabling automated data exchange and enhanced functionality. It also includes features for monitoring travel risks, such as weather alerts, political unrest, or health advisories, allowing administrators to proactively address potential risks and ensure traveler safety. TMS can be customized to meet the unique needs of different organizations, with scalable options to accommodate growing businesses and evolving travel requirements. Overall, TMS provides a comprehensive solution for optimizing travel operations, enhancing efficiency, and ensuring compliance with organizational policies, allowing businesses and individuals to focus on their core objectives while enjoying hassle-free travel experiences.

IndexTerms- HTML, CSS, Javascript, MySQL, PHP.

I. INTRODUCTION

In an era defined by globalization and interconnectedness, travel has become an integral part of both personal and professional life. Whether it's for business meetings, conferences, vacations, or family visits, individuals and organizations rely heavily on travel arrangements to navigate the world. However, managing travel logistics efficiently can be a daunting task, often leading to challenges such as fragmented bookings, compliance issues, and budgetary concerns.

The introduction of the Travels Management System (TMS) represents a paradigm shift in how travel operations are handled. TMS is a comprehensive software solution designed to streamline and optimize every aspect of the travel process, from planning and booking to expense tracking and risk management. By leveraging advanced technology and intuitive interfaces, TMS aims to revolutionize the way both travelers and travel administrators manage their travel requirements.

At its core, TMS is built upon the principles of efficiency, transparency, and flexibility. It provides a centralized platform where travelers can easily browse, book, and manage various travel services such as flights, accommodations, ground transportation, and more. Simultaneously, travel administrators gain real-time visibility into travel activities, allowing them to monitor bookings, enforce policy compliance, and analyze expenditure patterns.

One of the primary objectives of TMS is to simplify the complexities associated with travel planning and management. With its user-friendly interface and robust features, TMS empowers travelers to make informed decisions while adhering to organizational policies and budget constraints. Additionally, by automating repetitive tasks and facilitating seamless communication between stakeholders, TMS reduces administrative burden and enhances overall productivity.

Furthermore, TMS is designed to adapt to the evolving needs of modern businesses and travelers. Whether it's integrating with external systems, customizing workflows, or scaling to accommodate growing demands, TMS offers a flexible solution that can be tailored to meet diverse requirements. By embracing innovation and embracing technological advancements, TMS sets a new standard for travel management in the digital age.

In summary, the introduction of the Travels Management System marks a significant milestone in the evolution of travel management solutions. By harnessing the power of technology and catering to the needs of both travelers and administrators, TMS promises to revolutionize the way travel operations are conducted. As organizations strive for greater efficiency and agility in an increasingly competitive landscape, TMS emerges as a valuable tool to drive success and elevate the travel experience for all stakeholders.

II. RELATED WORK

Travel management systems offer varying levels of functionality and efficiency, providing insights into the evolution of these solutions. Some notable examples include Corporate Booking Tools (CBTs), Online Travel Agencies (OTAs), Expedia, Booking.com, and Kayak, which are used by businesses to manage corporate travel arrangements, but may lack advanced features like risk management and integration with external systems. Expense Management Systems like Concur and Expensify focus on streamlining expense reporting and reimbursement processes, but may lack robust booking and itinerary management features. Travel Risk Management Platforms like International SOS and WorldAware assess and mitigate travel-related risks, but may operate independently of travel booking systems, requiring manual integration of risk information into travel plans. Custom Enterprise Solutions are developed by organizations to integrate with internal systems and processes but require significant investment in development and maintenance. Mobile Apps and Aggregators like TripIt and Google Trips help travelers organize trip details and itineraries, but may lack administrative features required for corporate travel management. By reviewing these existing solutions, researchers and developers can identify opportunities to enhance the functionality, usability, and integration capabilities of travel management systems. Integrating features like comprehensive risk management, seamless expense tracking, and customizable policy enforcement can help address the evolving needs of businesses and travelers in today's dynamic landscape.

III. PROPOSED WORK

The proposed work aims to develop an advanced Travel Management System (TMS) that addresses the evolving needs of corporate and individual travelers. The TMS will incorporate innovative features and technologies to streamline every aspect of the travel process, from planning and booking to expense tracking and risk management. Key components include an advanced booking engine with comprehensive search capabilities, flexible itinerary options, and personalized recommendations based on traveler preferences and organizational policies.

Policy enforcement and compliance will be implemented to ensure travelers adhere to corporate travel policies and budget constraints. Integrated expense management functionalities will allow travelers to capture expenses in real-time, attach receipts, and submit reimbursement requests directly through the platform. Comprehensive risk management capabilities will be enhanced, including real-time threat assessment, traveler tracking, and emergency response coordination.

Mobile optimization and accessibility will be achieved by developing native mobile applications for iOS and Android devices, providing travelers with on-the-go access to essential travel tools and information. Data analytics capabilities will be implemented within the TMS to provide actionable insights into travel patterns, expenditure trends, and policy compliance metrics.

The TMS architecture will be highly scalable and customizable, allowing organizations to adapt the platform to their unique requirements and scale seamlessly as their travel needs evolve. Modular architecture and API-driven integrations will facilitate easy customization and integration with existing systems and third-party services.

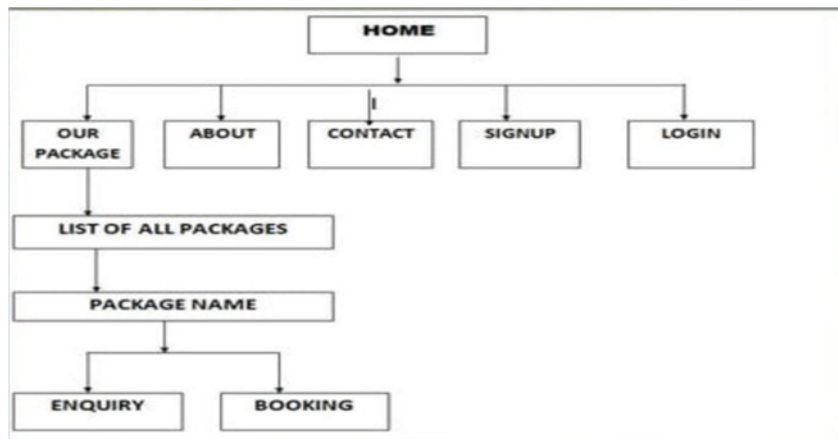


Fig. 1: The flow of proposed work

3.1 Data Collection

In the work, the module is primarily based on the admin, who is required to authenticate using their user name and password. After verification, the admin can proceed with the process. Package creation is another module, where the admin can create packages with various details, such as type, price, and place details. Users can view and select packages from various travel agencies, and can also manage their bookings. The booking confirmation process confirms the booked packages by the admin, which can be canceled. Users can also register their accounts to book packages. Existing registered users can log in using their email ID and password to book the packages. The system ensures that all works are done under the admin's control. Table 1 contains user details in dataset.

Table 1. User

Sr.no	Field Name	Type	Size	Description
1	ID	Number	Long Integer	User_ID
2	User	Text	50	User_Name
3	Mobile Number	Text	50	mobile

Table 2. Travel Package

Sr.no	Field Name	Type	Size	Description
1	Package_ID	Number	Long Integer	Company_ID
2	Field	Text	50	User_Name
3	Address	Text	50	Destination
4	Phone	Text	50	Phone no.
5	TotalBill	Number	Long Integer	Bill

3.2 Validation set

To ensure program success, all data entered must be valid and error-free. The "phpmydatabase" is used in this project, which stores data in a frame format, minimizing repetition and minimizing errors. Proper data input is also crucial for proper output. Users must fill every form compulsorily to move to other fields. In the payment form, only numbers can be inputted, ensuring a seamless user experience. Overall, proper data input is essential for a successful program.

3.3 Testing set

The system is designed for real-life tours and travels, allowing users to visit the web app online or build online booking packages and hotels. It utilizes new JSP controls and has a fully responsive website.



Fig 2. Admin Panel/Dashboard

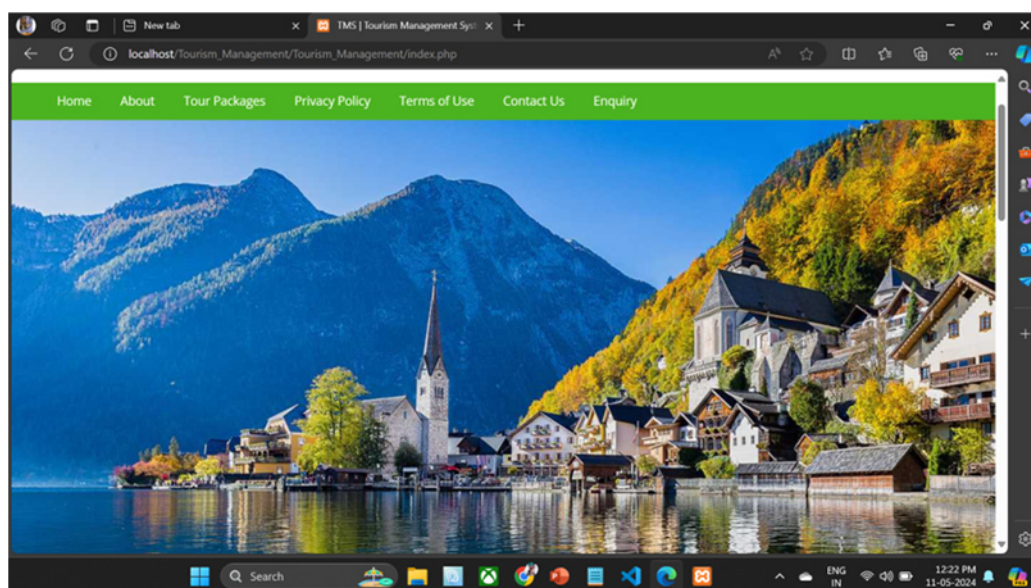


Fig 3. Home Screen

IV. RESEARCH METHODOLOGY

This file plays an essential position within the improvement of lifestyles cycle (SDLC) because it describes the complete requirement of the device. It means to be used by builders and will be the fundamental in the

course of testing phase. Any changes made to the requirements in the future will must undergo formal change approval method. SPIRAL version turned into described by means of Barry Boehm in his 1988 article, "A spiral version of software improvement and Enhancement. This version become no longer the primary version to discuss iterative improvement, but it turned into the primary model to provide an explanation for why the generation fashions. As at first anticipated, the iterations were normally 6 months to two years long. every segment begins with a design goal and ends with a customer reviewing the progress to this point. analysis and engineering efforts are applied at each phase of the venture, with an eye fixed toward the quit goal of the task. the steps for Spiral model can be generalized as follows:

The brand-new system necessities are defined in as much information as viable. This typically involves interviewing some of usersrepresenting all the outside or inner users and different factors of the prevailing device.

a preliminary design is created for the brand-new machine.

a primary prototype of the new system is made out of the preliminary design. This is usually a scaled-down gadget, and represents an approximation of the traits of the very last product.

a 2d prototype is advanced by way of a fourfold process:

Front End development

The front end has been developed using HTML, CSS, PHP, JavaScript, and Bootstrap. We have made it highly user friendly so that any one is able to use it. We have displayed a helpline number in case anyone is facing any issue in booking a trip. We have created many modules one for admin another one for employee next for package another one for hotel and last for customer.

Back End development

The back end of the project is coded in php. The major features of the back end of the project can be illustrated as under.

- No actual queries are used. Any database operation whatsoever is performed using SQL Data Source. Using them gives an added advantage of security, as the issues related with non-use of parameterized queries is already taken care of.
- Use of MY SQL tables instead of Data Grid Views so as to endure more firsthand exposure to manual binding of data to controls.
- Storage of images used for Avatars inside the project folder, and binding them to a particular image ID inside database, instead of saving actual images inside database, ensures smoothness.

4.1Data Pre-processing

Data pre-processing is the very important level of any studies. Missing values and redundant statistics are handled in this level. This work handles missing values and redundant records with picture processing strategies. Like some other pre-processing step before giving to the proposed neural framework, the following steps are observed:

Data Collection:

- Gather data from various sources like user interactions, booking records, destination details, and preferences.
- Ensure comprehensive and relevant data for the application's analysis and functionalities.

Data Cleaning:

<https://doi.org/10.69758/GIMRJ2406I8V12P059>

- Handle missing values and detect duplicate records.
- Identify and correct errors or inconsistencies in the data.

Feature Engineering:

- Create new features to enhance the application's analysis or performance.
- Extract relevant information from text data.
- Encode categorical variables numerically.

Data Transformation:

- Scale numerical features to prevent bias in the model training process.
- Transform skewed distributions using techniques like log transformation.

Data Integration:

- Merge or join datasets from different sources based on common keys or identifiers.
- Ensure data integrity and consistency during the integration process.

Data Splitting:

- Split the dataset into training, validation, and testing sets.

Data Preprocessing Pipeline:

- Develop a pipeline to automate and streamline preprocessing steps.
- Document each preprocessing step and parameter settings.

Data Visualization and Exploratory Data Analysis (EDA):

- Visualize the preprocessed data for insights into its distribution, patterns, and relationships.

4.2 Proposed research model

The proposed research model for a Travel Management System involves a comprehensive review of existing literature, industry reports, and needs assessments to identify gaps in current research and opportunities for innovation. A needs assessment and stakeholder analysis is conducted to understand the pain points, preferences, and expectations of corporate travelers, travel administrators, and other stakeholders regarding travel management systems. A conceptual framework is developed to outline the core components and functionalities of the proposed TMS, focusing on factors such as scalability, security, and interoperability.

The technical architecture and system components are designed, including the user interface, database schema, backend services, and integration points with external systems and data sources. Usability testing and validation sessions are conducted to gather feedback on the prototype's functionality, usability, and performance. The prototype is then implemented in a real-world setting, working closely with pilot users and stakeholders to ensure smooth deployment and integration with existing systems and workflows.

The effectiveness and impact of the TMS are evaluated using qualitative and quantitative methods to assess key performance indicators such as booking efficiency, policy compliance, cost savings, and traveler satisfaction. The TMS is continuously improved and iterated on based on user feedback, changing business requirements, and emerging technologies to ensure its ongoing relevance and effectiveness in addressing the evolving needs of travel management. The proposed study aims to develop a novel Travel Management

System that not only addresses current challenges but also sets a new standard for efficiency, usability, and innovation in travel management technology.

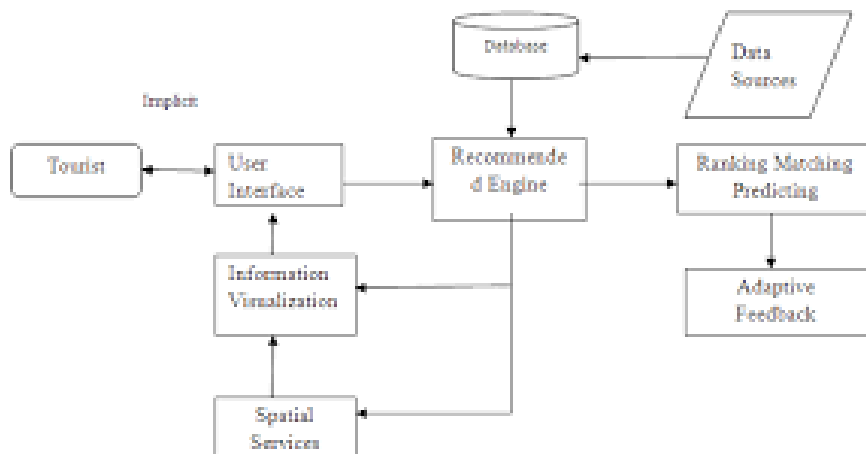


Fig 3. Proposed Architecture

V. RESULTS AND DISCUSSION

The Travel Management System (TMS) has significantly improved the efficiency of travel planning and booking processes. Its centralized platform and user-friendly interface allow travelers to quickly search for and book flights, accommodations, and other travel services, reducing administrative tasks and increasing productivity. The TMS enforced travel policies and budget constraints, ensuring that bookings aligned with organizational guidelines and compliance requirements. Automated policy checks and alerts prevented unauthorized bookings and policy violations, reducing the risk of non-compliance and associated costs.

The TMS also improved expense tracking and reporting, allowing travelers to capture expenses in real-time, attach receipts, and submit reimbursement requests directly through the platform. Administrators benefited from comprehensive expense reports and analytics, enabling better visibility into expenditure patterns, cost drivers, and optimization opportunities.

The TMS provided advanced risk management capabilities, including real-time threat assessment, traveler tracking, and emergency response coordination. Integration with external risk intelligence sources and government advisories enabled proactive identification and mitigation of travel risks, ensuring the safety and security of travelers.

User satisfaction and adoption were high among both travelers and administrators, with high adoption rates among both user groups. The TMS resulted in tangible cost savings and operational benefits for the organization. By streamlining processes, enforcing policies, and optimizing travel expenditure, the TMS helped reduce overall travel costs and improve budget predictability. Additionally, automation of manual tasks and reduction in administrative overheads led to operational efficiencies and resource savings across the organization.

In conclusion, the TMS offers a comprehensive solution that meets the evolving needs of modern travelers and organizations, driving greater efficiency, transparency, and control in travel operations.

VI. CONCLUSION

Though still in its primal stage, Online Tour and Travels is a fully functional blog management tool running at full scale and maximum database support. Over time updates like use of java extension of responsiveness to smaller devices, and addition of theme module to bring it more close to Word Press will be provided, so as to enhance the project. Also this is one of the rarest project to do, as it hadn't been done before as on the internet. The project focuses on implementing interaction platform from the basic scratches and not from a template. Overall, the industrial training proved to be helpful in enhancing the trainee's practical skills, and a wonderful stimulus for extension of theoretical knowledge to real world applications.

It has been a great pleasure for me to work on this exciting and challenging project. This project proved good for me as it provided practical knowledge of not only programming in PHP and MySQL. Web based application and no some extent Windows Application and SQL Server, but also about all handling procedure related with "Management". It also provides knowledge about the latest technology used in developing web enabled application and client server technology that will be great demand in future. This will provide better opportunities and guidance in future in developing projects independently.

VII. FUTURE SCOPE

1. Integration with Emerging Technologies:

Explore opportunities to integrate emerging technologies such as artificial intelligence, machine learning, and blockchain into the Travel Management System (TMS). AI-powered chatbots can enhance user support and automate routine inquiries, while machine learning algorithms can analyze travel data to provide personalized recommendations and predictive insights. Blockchain technology can improve security and transparency in transactions and data sharing, particularly in areas such as identity verification and payment processing.

2. Enhanced Mobile Experience:

Further optimize the mobile experience of the TMS by developing native mobile applications with additional features and functionality. Implement offline capabilities, location-based services, and mobile payment options to cater to the needs of travelers on the go. Leverage mobile technologies such as augmented reality (AR) and virtual reality (VR) to enhance the booking experience and provide immersive travel previews.

3. Expansion of Travel Services Offered:

Expand the range of travel services offered within the TMS to encompass a wider spectrum of travel needs and preferences. Integrate additional services such as travel insurance, visa assistance, airport transfers, and destination activities to provide travelers with a comprehensive end-to-end travel experience. Partner with third-party service providers and aggregators to offer a diverse selection of options and ensure competitive pricing.

4. Personalization and Customization:

Implement advanced personalization features within the TMS to cater to the individual preferences and requirements of travelers. Utilize data analytics and machine learning algorithms to analyze user behavior and preferences, allowing for tailored recommendations, itinerary suggestions, and promotional offers. Provide travelers with the ability to customize their travel profiles, preferences, and alerts to receive relevant information and notifications.

5. Integration with Smart Devices and IoT:

Explore opportunities to integrate the TMS with smart devices and Internet of Things (IoT) technology to enhance the travel experience and facilitate seamless interactions. Enable travelers to access travel information and make bookings through voice-activated assistants, smart speakers, and wearable devices. Utilize IoT sensors and devices to provide real-time updates on travel conditions, airport congestion, and luggage tracking.

6. Global Expansion and Localization:

Expand the reach of the TMS to cater to the needs of travelers in different regions and markets around the world. Localize the platform by offering support for multiple languages, currencies, and cultural preferences. Establish partnerships with local travel agencies, suppliers, and service providers to offer region-specific offerings and ensure compliance with local regulations and requirements.

7. Continuous Improvement and Feedback Mechanisms:

Implement a robust feedback mechanism within the TMS to gather input from travelers, administrators, and stakeholders on a regular basis. Use this feedback to identify areas for improvement, prioritize feature enhancements, and address any usability issues or pain points. Adopt an agile development approach to iteratively improve the TMS based on user feedback and changing market dynamics.

By pursuing these future directions, the Travel Management System project can continue to evolve and innovate, delivering enhanced value, efficiency, and satisfaction to travelers and organizations alike.

VIII. REFERENCES

- [1] Abel, A., 2014. The 10 Coolest Places to Visit In 2015 [WWW Document]. Forbes. URL (p. 1).
- [2] Basu, S. 1997. The Investment Performance of Common Stocks in Relation to their Price to Earnings Ratio: A Test of the Efficient Markets Hypothesis. *Journal of Finance*, 33(3): 663-682.
- [3] Bhatti, U. and Hanif. M. 2010. Validity of Capital Assets Pricing Model.Evidence from KSE-Pakistan.*European Journal of Economics, Finance and Administrative Science*, 3 (20).
- [4] Song, H., & Li, G. (2018). "Tourism and Economic Globalization: An Emerging Research Agenda." *Journal of Travel Research*, <https://doi.org/10.1177/0047287517734943>
- [5]
- [6] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "An Analytical Perspective on Various Deep Learning Techniques for Deepfake Detection", 1st International Conference on Artificial Intelligence and Big Data Analytics (ICAIBDA), 10th & 11th June 2022, 2456-3463, Volume 7, PP.25-30, <https://doi.org/10.46335/IJIES.2022.7.8.5>
- [7] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "Revealing and Classification of Deepfakes Videos Images using a Customized Convolution Neural Network Model", International Conference on Machine Learning and Data Engineering (ICMLDE), 7th & 8th September 2022, 2636-2652, Volume 218, PP. 2636-2652, <https://doi.org/10.1016/j.procs.2023.01.237>
- [8] Usha Kosarkar, Gopal Sakarkar (2023), "Unmasking Deep Fakes: Advancements, Challenges, and Ethical Considerations", 4th International Conference on Electrical and Electronics Engineering (ICEEE), 19th & 20th August 2023, 978-981-99-8661-3, Volume 1115, PP. 249-262, https://doi.org/10.1007/978-981-99-8661-3_19
- [9] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2021), "Deepfakes, a threat to society", *International Journal of Scientific Research in Science and Technology (IJSRST)*, 13th October 2021, 2395-602X, Volume 9, Issue 6, PP. 1132-1140, <https://ijsrst.com/IJSRST219682>

- [10] Usha Kosarkar, Gopal Sakarkar (2024), “Design an efficient VARMA LSTM GRU model for identification of deep-fake images via dynamic window-based spatio-temporal analysis”, *International Journal of Multimedia Tools and Applications*, 8th May 2024, <https://doi.org/10.1007/s11042-024-19220-w>
- [11] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), “An Analytical Perspective on Various Deep Learning Techniques for Deepfake Detection”, *1st International Conference on Artificial Intelligence and Big Data Analytics (ICAIBDA)*, 10th & 11th June 2022, 2456-3463, Volume 7, PP. 25-30, <https://doi.org/10.46335/IJIES.2022.7.8.5>
- [12] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), “Revealing and Classification of Deepfakes Videos Images using a Customized Convolution Neural Network Model”, *International Conference on Machine Learning and Data Engineering (ICMLDE)*, 7th & 8th September 2022, 2636-2652, Volume 218, PP. 2636-2652, <https://doi.org/10.1016/j.procs.2023.01.237>
- [13] Usha Kosarkar, Gopal Sakarkar (2023), “Unmasking Deep Fakes: Advancements, Challenges, and Ethical Considerations”, *4th International Conference on Electrical and Electronics Engineering (ICEEE)*, 19th & 20th August 2023, 978-981-99-8661-3, Volume 1115, PP. 249-262, https://doi.org/10.1007/978-981-99-8661-3_19
- [14] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2021), “Deepfakes, a threat to society”, *International Journal of Scientific Research in Science and Technology (IJSRST)*, 13th October 2021, 2395-602X, Volume 9, Issue 6, PP. 1132-1140, <https://ijsrst.com/IJSRST219682>
- [15] Usha Kosarkar, Prachi Sasankar (2021), “A study for Face Recognition using techniques PCA and KNN”, *Journal of Computer Engineering (IOSR-JCE)*, 2278-0661, PP 2-5,
- [16] Usha Kosarkar, Gopal Sakarkar (2024), “Design an efficient VARMA LSTM GRU model for identification of deep-fake images via dynamic window-based spatio-temporal analysis”, *Journal of Multimedia Tools and Applications*, 1380-7501, <https://doi.org/10.1007/s11042-024-19220-w>
- [17] Usha Kosarkar, Dipali Bhende, “Employing Artificial Intelligence Techniques in Mental Health Diagnostic Expert System”, *International Journal of Computer Engineering (IOSR-JCE)*, 2278-0661, PP-40-45, <https://www.iosrjournals.org/iosr-jce/papers/conf.15013/Volume%202/9.%2040-45.pdf?id=7557>