

**AI driven task visualization and progress tracking system with
collaborative problem-solving technique**

Submitted in partial fulfillment of the requirements for the award

Of Bachelor of Technology Degree in Information Technology

By

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**DEPARTMENT OF INFORMATION TECHNOLOGY
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**SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **N JANANI (40120039)**, **V CLAUDIA PRINCY (40120023)** who have done the Project work as a team who carried out the project entitled "Ai Driven Task Visualization And Progress Tracking System With Collaborative Problem Solving Technique" under my supervision from January 2024 to April 2024

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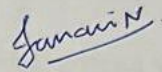
DECLARATION

DECLARATION

We, JANANI N (40120039) and CLAUDIA PRINCY V (40120023) hereby declare that the Project Report entitled **AI Driven integrated task visualization and Progress Tracking system with collaborative problem-solving Technique** done by me under the guidance of **Ms.T.G.RUBYANGEL M.TECH** is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in **Information Technology**.

DATE: 17.4.23

PLACE: Chennai



SIGNATURE OF THE CANDIDATE

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ABSTRACT

This paper introduces an innovative system leveraging artificial intelligence (AI) for task visualization, process tracking, and collaborative problem-solving. In contemporary work environments, the complexity of tasks and processes often hinders efficient collaboration and decision-making. Our proposed system addresses this challenge by employing AI algorithms to visualize tasks and track their progress in real-time. Through a user-friendly interface, team members can interact with the system, update task statuses, and provide feedback. The system integrates collaborative problem-solving techniques, enabling team members to collectively tackle challenges and make informed decisions. AI algorithms analyze data from various sources, including task progress, team feedback, and historical patterns, to provide insightful recommendations and facilitate effective problem-solving strategies. The system includes intuitive task visualization dashboards, real-time progress tracking, automated notifications, and collaborative decision-making tools. Additionally, the AI-driven analytics engine continuously learns from user interactions and evolves to better support team collaboration and problem-solving efforts. Our system offers a comprehensive solution to enhance team productivity, foster collaboration, and streamline problem-solving processes in modern work environments. By harnessing the power of AI, organizations can optimize resource allocation, improve decision-making, and achieve better outcomes in their projects and initiatives.

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CHAPTER 1

INTRODUCTION

Introduction to AI-Driven Task Visualization

AI-Driven Task Visualization offers a cutting-edge approach to task management, progress tracking, and collaborative problem-solving within various industries. Leveraging advanced artificial intelligence technologies, this system revolutionizes how teams visualize their tasks, monitor their progress, and solve complex problems collectively. By integrating AI algorithms, machine learning techniques, and data visualization tools, this system provides real-time insights into task performance, identifies bottlenecks, and offers predictive analytics to optimize workflow efficiency. Through interactive dashboards and customizable visual representations, team members can efficiently allocate resources, prioritize tasks, and track project milestones with precision. Additionally, the collaborative problem-solving feature enables team members to brainstorm ideas, share insights, and collectively address challenges in a dynamic and interactive manner. This innovative approach not only enhances productivity and decision-making but also fosters a collaborative and creative work environment where teams can leverage each other's strengths and expertise to achieve common goals. AI-Driven Task Visualization is poised to revolutionize the way organizations manage tasks, track progress, and solve complex problems, ushering in a new era of efficiency and collaboration in the digital age.

Progress Tracking System Overview

The AI-driven task visualization and progress tracking system is designed to provide a comprehensive overview of tasks and their status through advanced artificial intelligence technology. The system utilizes data visualization techniques to represent task progress in a visually accessible manner, enabling users to easily identify bottlenecks or areas requiring attention. Additionally, the system incorporates collaborative problem-solving techniques to facilitate team collaboration and brainstorming. By leveraging AI algorithms, the system can analyze task data and provide insights to optimize workflows and improve efficiency. Overall, this system offers a powerful tool for organizations to enhance productivity, streamline processes, and foster effective teamwork in achieving project goals.

Collaborative Problem-Solving Techniques

One effective collaborative problem-solving technique for an AI-driven task visualization and progress tracking system is the use of problem-solving workshops, where team members can come together to analyze and solve complex issues related to the system. By facilitating brainstorming sessions and encouraging open communication, this approach can help generate a variety of perspectives and ideas that can lead to innovative solutions. Another technique is creating a shared online platform where team members can collaborate in real time, share updates, track progress, and communicate effectively. This platform can serve as a central hub for all project-related information, enabling team members to stay organized and informed throughout the problem-solving process. Additionally, implementing a feedback mechanism that allows team members to provide input, suggestions, and evaluations on the system's performance can enhance collaboration and drive continuous improvement. By incorporating these collaborative problem-solving techniques, an AI-driven task visualization and progress tracking system can foster a culture of teamwork, creativity, and efficiency in addressing challenges and achieving goals.

Benefits of Integrated AI in Task Management

Integrated AI in task management offers numerous benefits for AI-driven task visualization and progress tracking systems with collaborative problem-solving techniques. Firstly, the ability of AI to analyze vast amounts of data and provide real-time insights allows for enhanced task visualization by presenting information in a clear and concise manner. This enables users to quickly grasp the status of different tasks, priorities, and dependencies, thereby improving overall task management efficiency. Secondly, AI-driven progress tracking systems can automatically monitor and update task progress, milestones, and deadlines, reducing the need for manual input and oversight. This real-time tracking not only facilitates better decision-making but also helps in identifying bottlenecks or potential issues early on, ensuring timely project completion. Thirdly, the collaborative problem-solving technique supported by AI fosters teamwork and communication among team members, as it allows for seamless sharing of information, ideas, and feedback. By facilitating collaboration, AI promotes a more efficient problem-solving process, leading to innovative solutions and improved task outcomes.

CHAPTER 2

LITERATURE SURVEY

1.Ouyang, F., Xu, W., & Cukurova, M. (2023). An artificial intelligence-driven learning analytics method to examine the collaborative problem-solving process from the complexadaptive systems perspective. International Journal of Computer-Supported Collaborative Learning, 18(1), 39-66.

Ouyang, F., Xu, and Cukurova (2023) present an artificial intelligence-driven learning analytics method in their study, focusing on examining the collaborative problem-solving process through the lens of complex adaptive systems. Their research published in the International Journal of Computer-Supported Collaborative Learning provides insights into a cutting-edge approach to task visualization and progress tracking. This innovative system incorporates AI to enhance collaborative problem-solving techniques, offering a deeper understanding of the dynamics at play within complex adaptive systems.

2.Tang, H., Dai, M., Du, X., Hung, J. L., & Li, H. (2023). Understanding college students' cognitive engagement in online collaborative problem-solving: A multimodal data analysis. Distance Education, 44(2), 306-323.

Tang et al. (2023) conducted a study on understanding college students' cognitive engagement in online collaborative problem-solving through multimodal data analysis. Their research, published in Distance Education, focuses on how students engage in collaborative problem-solving activities online. This study provides valuable insights for the development of an AI-driven task visualization and progress tracking system that can enhance collaborative problem-solving techniques in educational settings. The findings offer a foundation for leveraging technology for better understanding and improving student engagement in online learning environments.

3.Siiman, L. A., Rannastu-Avalos, M., Pöysä-Tarhonen, J., Häkkinen, P., & Pedaste, M. (2023, August). Opportunities and Challenges for AI-Assisted Qualitative Data Analysis: An Example from Collaborative Problem-Solving Discourse Data. In International Conference on Innovative Technologies and Learning (pp. 87-96). Cham: SpringerNature Switzerland.

Siiman, L. A., Rannastu-Avalos, M., Pöysä-Tarhonen, J., Häkkinen, P., and Pedaste, M. (2023) explore the opportunities and challenges of AI-assisted qualitative data analysis in the context of collaborative problem-solving discourse data. Their research, presented at the International Conference on Innovative Technologies and Learning, focuses on developing a system for task visualization and progress tracking using AI-driven techniques. By integrating collaborative problem-solving techniques into the system, the authors aim to enhance the efficiency and effectiveness of qualitative data analysis, offering valuable insights for future research and practice.

4.Lajoie, S. P., & Li, S. (2023). Theory-driven design of AIED systems for enhanced interaction and problem-solving. In Handbook of artificial intelligence in education (pp.229-249). Edward Elgar Publishing.

Lajoie, S. P., & Li, S. (2023) discuss the theory-driven design of AIED systems for enhanced interaction and problem-solving in their chapter "Theory-driven design of AIED systems for enhanced interaction and problem-solving" in the Handbook of artificial intelligence in education by Edward Elgar Publishing. The authors explore the use of AI-driven task visualization and progress tracking systems with collaborative problem-solving techniques to enhance the learning experience. Their work focuses on leveraging artificial intelligence to improve interaction and problem-solving skills within educational settings, offering valuable insights for the development of innovative learning solutions.

5. Supriyadi, E., & Kuncoro, K. S. (2023). Exploring the future of mathematics teaching: Insight with ChatGPT. Union: Jurnal Ilmiah Pendidikan Matematika, 11(2), 305-316. Supriyadi, E., & Kuncoro, K. S. (2023) in their paper titled "Exploring the future of mathematics teaching: Insight with ChatGPT" published in Union: Jurnal Ilmiah Pendidikan Matematika, delve into the innovative possibilities of integrating ChatGPT for enhancing mathematics teaching methodologies. Their research sheds light on utilizing AI-driven tools for task visualization and progress tracking within collaborative problem-solving techniques, aiming to revolutionize the educational landscape. This study contributes valuable insights into the potential of AI technologies to transform mathematics education and facilitate more effective learning experiences.

6. Rane, N. (2023). ChatGPT and similar Generative Artificial Intelligence (AI) for building and construction industry: Contribution, Opportunities and Challenges of large language Models for Industry 4.0, Industry 5.0, and Society 5.0. Opportunities and Challenges of Large Language Models for Industry, 4.

In Rane, N.'s (2023) study, the focus is on leveraging Generative Artificial Intelligence, like ChatGPT, for the building and construction industry. The research explores the contributions, opportunities, and challenges that large language models bring to Industry 4.0, Industry 5.0, and Society 5.0. Specifically, the study delves into the potential of these AI-driven models for task visualization, progress tracking systems, and collaborative problem-solving techniques within the industry, highlighting the opportunities and challenges they present for advanced applications in construction projects.

7. Lu, J., Wu, S., Wang, Y., & Zhang, Y. (2023). Visualizing the Commognitive Processes of Collaborative Problem Solving in Mathematics Classrooms. The Asia-Pacific Education Researcher, 32(5), 615-628.

Lu, J., Wu, S., Wang, Y., & Zhang, Y. (2023) explore the visual representation of Commognitive Processes during Collaborative Problem Solving in Mathematics classrooms. The study, published in The Asia-Pacific Education Researcher, delves into how students engage in problem-solving tasks collectively. Their findings can be instrumental in developing an AI-driven task visualization and progress tracking system that supports collaborative problem-solving techniques. By understanding the cognitive processes involved, educators and developers can enhance student learning experiences through effective visualization tools and monitoring mechanisms.

8. Tang, Y., Du, X., Hung, J. L., Li, H., Tang, H., & Xie, Y. (2024). Exploring the effects of roles and group compositions on social and cognitive interaction structures in online collaborative problem-solving. Education and Information Technologies, 1-32.

In the study by Tang et al. (2024), the researchers focused on investigating the impacts of roles and group compositions on social and cognitive interaction structures in online collaborative problem-solving. The research delves into how these factors influence the dynamics of group interactions and problem-solving processes in online settings. By exploring these effects, the study aims to provide valuable insights into optimizing collaborative problem-solving strategies through targeted role assignments and group compositions. The findings of this research could potentially inform the development of AI-driven task visualization and progress tracking systems that enhance collaborative problem-solving techniques in educational contexts.

9. Kaliisa, R., Dane, J. O., Sanchez, D., Pratt, J., Damsa, C., & Scianna, J. (2023, October). Understanding Group Dynamics During Synchronous Collaborative Problem-Solving Activities: An Epistemic Network Approach. In International Conference on Quantitative Ethnography (pp. 81-95). Cham: Springer Nature Switzerland.

Kaliisa, R., Dane, J. O., Sanchez, D., Pratt, J., Damsa, C., & Scianna, J. (2023) explore group dynamics in synchronous collaborative problem-solving using an Epistemic Network Approach. Their research, presented at the International Conference on Quantitative Ethnography, focuses on enhancing understanding and tracking progress in collaborative problem-solving activities through innovative techniques.

10. Pal, A., Lin, J. J., Hsieh, S. H., & Golparvar-Fard, M. (2023). Automated vision-based construction progress monitoring in built environment through digital twin. *Developments in the Built Environment*, 100247.

Pal et al. (2023) present an automated vision-based construction progress monitoring system through a digital twin in the built environment, aiming to enhance task visualization and progress tracking with AI. The collaborative problem-solving technique integrated into the system further enhances efficiency and accuracy in monitoring construction activities.

CHAPTER 3

METHODOLOGY

3.1 MODULES:

There are four modules in “**Ai Driven Task Visualization And Progress Tracking System With Collaborative Problem Solving Technique**” namely :

3.1.1. AI Driven Task Visualization Module

3.1.2. Progress Tracking System Module

3.1.3. Collaborative Problem Solving Technique Module

3.1.4. Efficient Issue-Addressing System with Hierarchical Escalation Module

3.1.1. AI Driven Task Visualization :

The AI-Driven Task Visualization system enables users to visually track and manage their tasks using advanced AI technology, offering a sophisticated approach to progress monitoring and problem-solving. By leveraging AI algorithms, this system can provide real-time updates on task completion, identify potential roadblocks, and suggest optimized solutions. The collaborative problem-solving technique further enhances the system by facilitating teamwork and shared problem-solving strategies among users. This innovative system not only offers a comprehensive view of individual and collective progress but also aims to boost productivity and efficiency by streamlining task management processes. With its AI-driven capabilities and collaborative features, this task visualization system presents a modern solution for organizations and individuals looking to enhance their task management and problem-solving practices.

3.1.2. Progress Tracking System :

The Ai-driven progress tracking system offers a dynamic and streamlined approach to visualizing and monitoring task progress. By leveraging artificial intelligence, this system provides real-time updates and insights into the status of various tasks, enabling users to make informed decisions and adjust priorities accordingly. The collaborative problem-solving technique embedded within the system

promotes teamwork and shared responsibility in resolving challenges, fostering a more cohesive and efficient work environment. Through interactive tools and features, team members can actively engage in problem-solving activities, share ideas, and coordinate efforts to overcome obstacles. Overall, this innovative system enhances productivity and coordination, empowering teams to achieve their goals effectively and efficiently through continuous monitoring and adaptive problem-solving strategies.

3.1.3.Collaborative Problem Solving Technique:

Designing an AI-driven task visualization and progress tracking system with a collaborative problem-solving technique involves a structured approach to encourage team engagement and productivity. Through this technique, team members can collectively identify challenges, generate innovative solutions, and monitor progress seamlessly. The system should enable real-time data visualization, providing team members with a clear overview of tasks, milestones, and dependencies. Implementing collaborative problem-solving techniques such as brainstorming sessions, peer feedback mechanisms, and cross-functional collaboration can enhance communication and foster a culture of shared responsibility. Furthermore, incorporating features like task assignments, progress updates, and automated notifications can streamline workflow and improve accountability. By integrating these elements within the AI-driven system, teams can boost efficiency, transparency, and overall project success.

3.1.4.Efficient Issue-Addressing System with Hierarchical Escalation Module:

The core of the system is an issue tracking platform, which could be a specialized software or a customized solution built within the organization's existing infrastructure. This platform allows users to report issues, assign them to specific teams or individuals, and track their resolution status. This module defines a structured process for escalating issues based on their severity, impact, or time sensitivity. It consists of predefined escalation paths that guide how issues should be escalated from lower-level teams to higher-level authorities if they cannot be resolved within a certain timeframe or if they require additional resources or expertise. If an issue remains unresolved for a certain period or if it meets specific predefined conditions, the system

automatically escalates it to the next level in the hierarchy. By implementing an efficient issue-addressing system with a hierarchical escalation module, organizations can streamline their problem-solving processes, ensure timely resolution of issues, and minimize disruptions to operations.

3.2 ALGORITHMS:

3.2.1. Natural Language Processing (NLP):

Natural Language Processing (NLP) algorithms are essential components of AI-driven systems for task visualization, progress tracking, and collaborative problem solving. These algorithms enable the system to understand, process, and generate natural language text, which is crucial for tasks such as task descriptions, comments, and user interactions. Sentiment analysis in nlp determines the sentiment or opinion expressed in text (e.g., positive, negative, neutral). This algorithm analyzes text to identify subjective information, enabling the system to understand user sentiment, feedback, or attitudes towards tasks or collaborators. Text classification assigns predefined categories or labels to text documents. This algorithm categorizes text based on its content or topic, facilitating tasks such as task categorization, topic modeling, and content filtering. By leveraging these NLP algorithms, AI-driven systems can effectively process, analyze, and interpret natural language text, enabling advanced functionalities such as task understanding, collaboration facilitation, and knowledge extraction.

3.2.2. Term Frequency-Inverse Document Frequency (TF-IDF):

TF-IDF algorithm is a widely used technique in Natural Language Processing (NLP) for information retrieval and text mining tasks. It aims to reflect the importance of a term in a document relative to its importance across a collection of documents. TF-IDF is commonly used for tasks such as text classification, document similarity calculation, and keyword extraction. For feedback analysis it Sort the terms within each feedback document based on their TF-IDF scores. Identify the top-ranked terms in each document, which represent the most significant and relevant terms within that feedback.

By applying the TF-IDF algorithm to feedback analysis, organizations can extract valuable insights from textual feedback data, understand customer opinions and preferences, and make data-driven decisions to enhance products, services, and

customer experiences. TF-IDF (Term Frequency-Inverse Document Frequency) algorithm can be effectively applied to issue addressing systems for analyzing and prioritizing issues based on their textual descriptions and related documents. By leveraging TF-IDF algorithm for issue addressing, organizations can analyze and prioritize issues based on their textual descriptions, identify common themes or topics, and allocate resources more efficiently for issue resolution and problem-solving.

3.2.3. Recurrent Neural Networks (RNNs):

RNN can be employed as decision support systems in various domains where sequential data is involved, such as time series forecasting, natural language processing, and medical diagnosis. Collect and preprocess relevant data for the decision-making task. This could include time series data, textual data, or any other sequential data relevant to the decision context. Once the RNN model is trained, use it to make predictions or generate insights for decision-making. For time series forecasting, use the RNN model to predict future values based on historical data. For natural language processing tasks, such as sentiment analysis or text classification, use the RNN model to analyze textual data and provide recommendations or insights. For medical diagnosis, use the RNN model to analyze patient data and provide diagnostic predictions or treatment recommendations. By leveraging RNNs as decision support systems, organizations can analyze sequential data, make predictions or recommendations, and support decision-making processes in various domains more effectively.

3.3 SYSTEM ARCHITECTURE:

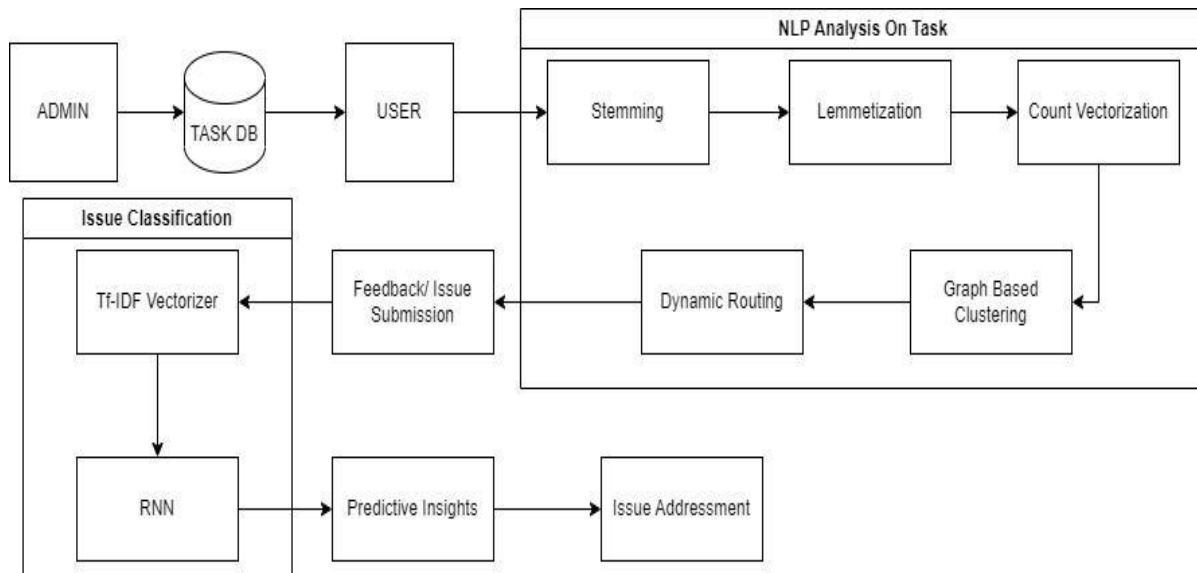


Fig:3.3.1.flow chart

1. User gives input or a sentences
2. NLP process takes place
 - Steaming
 - Lemitation(the process of reducing words to their base or root form)
 - Count vectorization(converting text data into numerical vectors)
 - Grapbased(Convert the text data into a graph structure)
3. After the NLP Process we get the feedback from the employee
4. The feedback or the issue is submitted
5. After that it identifies what kind of issue is given by the user/employee
6. After prediction issue is addressed to the concern higher authority

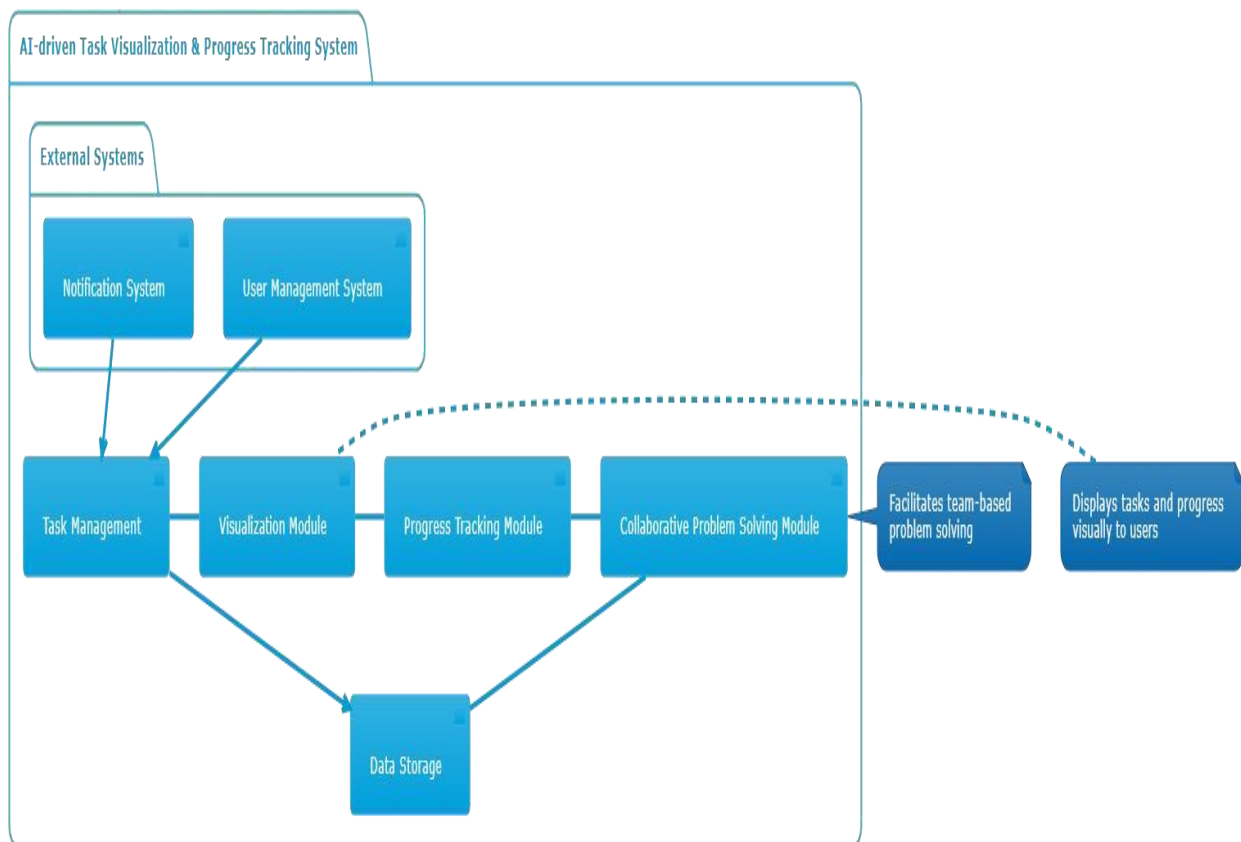


Fig:3.3.2 System architecture

This is the entire representation of the process here, the admin will assign a task for the employee it will be visible to the employee user id after assigning a task by admin employee will be get a notification that he / she got a task to do. They can view that by longing in to their respected user ids. The assigned task will be visible by using visualization module task will be visible to the employee .Once the task is completed employee will give a tick mark it will notifies the admin that the desire task is completed by the respective employee. If the employee want to raise any issues he/she can submit the issue in the forum. It will be addressed by higher authority.

3.4 REQUIREMENTS ANALYSIS :

3.4.1. FESABILITY STUDY

A feasibility study for an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques involves assessing the practicality and potential success of implementing such a system within an organization. The study would evaluate factors such as the technical capabilities required for developing the AI algorithms, the cost implications of building and maintaining the system, the level of user adoption within the organization, and the potential benefits it would bring in terms of improved task management and team collaboration. Additionally, the study would analyze the existing infrastructure and data availability to support the AI-driven system, as well as any potential regulatory or ethical considerations that may arise. By conducting a comprehensive feasibility study, the organization can determine if the proposed system aligns with its goals, resources, and operational needs, ultimately guiding decision-making on whether to proceed with the development and implementation of the AI-driven task visualization and progress tracking system.

3.4.1.1. ECONOMICAL FEASIBILITY

Economic feasibility is a crucial aspect to consider when implementing an artificial intelligence (AI) driven task visualization and progress tracking system with collaborative problem-solving techniques. This type of system can bring significant benefits to organizations by improving efficiency, decision-making, and overall productivity. One key aspect of economic feasibility is the initial investment required to develop and implement the AI system. This includes costs related to acquiring and configuring the necessary hardware and software, as well as costs associated with training personnel to use the system effectively. Additionally, ongoing maintenance and support costs should be factored in to ensure the system continues to operate efficiently. When evaluating the economic feasibility of an AI-driven system, organizations should consider the potential return on investment (ROI). This can be measured through various metrics such as cost savings, revenue generation, increased productivity, and improved decision-making. The ROI of the system should justify the initial investment and ongoing costs, making it a financially viable solution for the organization.

Furthermore, economic feasibility also involves considering the long-term implications of implementing the AI system. This includes evaluating scalability options, potential future upgrades, and the system's ability to adapt to changing business needs. Organizations should ensure that the benefits of the system will continue to outweigh the costs over the system's lifecycle. Collaborative problem-solving techniques within the AI-driven system can further enhance its economic feasibility. By encouraging teamwork, knowledge sharing, and efficient decision-making, organizations can maximize the system's capabilities and drive better outcomes. This collaborative approach can lead to cost savings, improved efficiencies, and a more productive workforce. In conclusion, evaluating the economic feasibility of an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques is essential for organizations looking to leverage the benefits of AI technology. By carefully considering the initial costs, potential return on investment, long-term implications, and collaborative possibilities, organizations can ensure the system is a financially viable and valuable asset to their operations.

3.4.1.2. TECHNICAL FEASIBILITY

Technical feasibility refers to the capability of a proposed system, such as an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques, to be developed and implemented successfully using available technology and resources. In the case of this system, several key aspects need to be considered to assess its technical feasibility. Firstly, the AI technology that will be used to power the task visualization and progress tracking features must be robust and scalable. This includes ensuring that the AI algorithms and models can effectively process and analyze large amounts of data in real-time to provide accurate insights and recommendations. Additionally, the system should be designed to continuously learn and improve over time to enhance its problem-solving capabilities. Secondly, the system's collaboration features, such as real-time communication and document sharing, must be reliable and secure. This involves implementing secure data transmission protocols, user authentication mechanisms, and access controls to protect sensitive information and maintain the privacy of users' data. It is also important to consider potential integration with existing collaboration tools and platforms to enhance interoperability and user adoption.

Furthermore, the system should be developed using modern software development best practices and frameworks to ensure its maintainability and scalability. This includes using modular architecture, version control, automated testing, and deployment processes to streamline development and updates. Additionally, considering factors such as performance optimization, data storage requirements, and scalability options will be crucial to ensure the system can support a large number of users and tasks effectively. In conclusion, assessing the technical feasibility of an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques involves evaluating the capabilities of the AI technology, collaboration features, and development approach to ensure a successful implementation. By addressing these key aspects, businesses can confidently proceed with the development of a system that meets the needs of users and delivers valuable insights for improved decision-making and problem-solving.

3.4.1.3 OPERATIONAL FEASIBILITY

Operational feasibility refers to the practicality and viability of implementing a new system or project within an existing organizational environment. In the context of an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques, operational feasibility becomes crucial in ensuring the successful adoption and utilization of the new technology by all stakeholders. One key aspect of operational feasibility in this scenario is understanding the existing workflows and processes within the organization and how the new system will fit into these structures. The AI-driven task visualization system should align with the current way tasks are assigned, tracked, and completed to minimize disruption and ensure easy integration. It is important to assess whether the system can easily interface with existing software and tools used by employees for a seamless transition. Another critical consideration for operational feasibility is the availability of resources, both in terms of finances and expertise. Implementing an AI-driven system can be resource-intensive, requiring investment in technology, training, and ongoing maintenance. Organizations need to evaluate if they have the necessary budget and skilled personnel to support the implementation of the system effectively. Additionally, the system should be user-friendly and intuitive to encourage widespread adoption among employees. Training and change management efforts should be included in the implementation plan to ensure that all users are comfortable.

Lastly, monitoring and evaluation mechanisms should be built into the system to track its performance and gather feedback from users. This feedback loop is essential for identifying any operational challenges or areas for improvement, allowing for continuous refinement and optimization of the system. In conclusion, ensuring operational feasibility for an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques involves thorough planning, resource assessment, user engagement, and continuous monitoring. By addressing these aspects, organizations can increase the likelihood of successful implementation and maximize the benefits of the new technology.

3.4.1.4 SOCIAL FEASIBILITY

Social feasibility refers to the ability of a new technology or system to be accepted and effectively used within a particular social context. In the case of an AI-driven task visualization and progress tracking system with collaborative problem-solving technique, social feasibility plays a critical role in determining the success and adoption of the system within an organization or community. One key aspect of social feasibility in this context is ensuring that the system is user-friendly and accessible to a diverse group of users. This includes providing intuitive interfaces, clear instructions, and responsive support systems to help users navigate and utilize the system effectively. By taking into consideration the needs and preferences of different user groups, the system can better meet the social requirements for acceptance and usability. Collaboration is another important aspect of social feasibility in this system. The ability for users to work together on tasks, share progress updates, and solve problems collectively can enhance the sense of community and engagement around the system. By promoting collaboration and teamwork, the system can foster a positive social environment that encourages users to actively participate and contribute towards achieving shared goals. Moreover, addressing privacy and security concerns is crucial for ensuring social feasibility. Users must feel confident that their data and information are protected within the system, and that their privacy rights are respected. By implementing robust security measures and transparent data policies, the system can build trust and credibility among users, which is essential for long-term adoption and success.

In conclusion, social feasibility is a key consideration for the development and implementation of an AI-driven task visualization and progress tracking system with collaborative problem-solving technique. By prioritizing user-friendliness, collaboration, and data security, the system can enhance its acceptance and effectiveness within the social context it operates in. The level of user adoption within the organization, and the potential benefits it would bring in terms of improved task management and team collaboration. Additionally, the study would analyze the existing infrastructure and data availability to support the AI-driven system, as well as any potential regulatory or ethical considerations that may arise. By conducting a comprehensive feasibility study, the organization can determine if the proposed system aligns with its goals, resources, and operational needs, ultimately guiding decision-making on whether to proceed with the development and implementation of the AI-driven task visualization and progress tracking system.

3.5 SOFTWARE REQUIREMENTS :

3.5.1. Hardware specifications:

Microsoft Server enabled computers, preferably workstations

Higher RAM, of about 4GB or above

Processor of frequency 1.5GHz or above

3.5.2. Software specifications:

Python 3.6 and higher

Anaconda software

3.5.2.1 PYTHON

Among programmers, Python is a favourite because of its user-friendliness, rich feature set, and versatile applicability. Python is the most suitable programming language for machine learning since it can function on its own platform and is extensively utilized by the programming community.

Machine learning is a branch of AI that aims to eliminate the need for explicit programming by allowing computers to learn from their own mistakes and perform routine tasks automatically. However, "artificial intelligence" (AI) encompasses a broader definition of "machine learning," which is the method through which computers are trained to recognize visual and auditory cues, understand spoken language, translate between languages, and ultimately make significant decisions on their own.

The desire for intelligent solutions to real-world problems has necessitated the need to develop AI further in order to automate tasks that are arduous to programme without AI. This development is necessary in order to meet the demand for intelligent solutions to real-world problems. Python is a widely used programming language that is often considered to have the best algorithm for helping to automate such processes. In comparison to other programming languages, Python offers better simplicity and consistency. In addition, the existence of an active Python community makes it simple for programmers to talk about ongoing projects and offer suggestions on how to improve the functionality of their programme.

3.5.2.2 ANACONDA

Anaconda is an open-source package manager for Python and R. It is the most popular platform among data science professionals for running Python and R implementations. There are over 300 libraries in data science, so having a robust distribution system for them is a must for any professional in this field. Anaconda simplifies package deployment and management. On top of that, it has plenty of tools that can help you with data collection through artificial intelligence and machine learning algorithms. With Anaconda, you can easily set up, manage, and share Conda environments. Moreover, you can deploy any required project with a few clicks when you're using Anaconda.

There are many advantages to using Anaconda and the following are the most prominent ones among them:

Anaconda is free and open-source. This means you can use it without spending any money. In the data science sector, Anaconda is an industry staple. It is open-source too, which has made it widely popular. If you want to become a data science professional, you must know how to use Anaconda for Python because every recruiter expects you to have this skill. It is a must-have for data science.

It has more than 1500 Python and R data science packages, so you don't face any compatibility issues while collaborating with others. For example, suppose your colleague sends you a project which requires packages called A and B but you only have package A. Without having package B, you wouldn't be able to run the project. Anaconda mitigates the chances of such errors. You can easily collaborate on projects without worrying about any compatibility issues.

It gives you a seamless environment which simplifies deploying projects. You can deploy any project with just a few clicks and commands while managing the rest. Anaconda has a thriving community of data scientists and machine learning professionals who use it regularly. If you encounter an issue, chances are, the community has already answered the same. On the other hand, you can also ask people in the community about the issues you face there, it's a very helpful community ready to help new learners. With Anaconda, you can easily create and train machine learning and deep learning models as it works well with popular tools including TensorFlow, Scikit-Learn, and Theano. You can create visualizations by using Bokeh, Holoviews, Matplotlib, and Datashader while using Anaconda.

How to Use Anaconda for Python

Now that we have discussed all the basics in our Python Anaconda tutorial, let's discuss some fundamental commands you can use to start using this package manager.

Listing All Environments

To begin using Anaconda, you'd need to see how many Conda environments are present in your machine.

```
conda env list
```

It will list all the available Conda environments in your machine.

Creating a New Environment

You can create a new Conda environment by going to the required directory and use this command:

```
conda create -n <your_environment_name>
```

You can replace `<your_environment_name>` with the name of your environment. After entering this command, conda will ask you if you want to proceed to which you should reply with y:

```
proceed ([y])/n)?
```

On the other hand, if you want to create an environment with a particular version of Python, you should use the following command:

```
conda create -n <your_environment_name> python=3.6
```

Similarly, if you want to create an environment with a particular package, you can use the following command:

```
conda create -n <your_environment_name> pack_name
```

Here, you can replace `pack_name` with the name of the package you want to use. If you have a `.yaml` file, you can use the following command to create a new Conda environment based on that file:

```
conda env create -n <your_environment_name> -f <file_name>.yaml
```

We have also discussed how you can export an existing Conda environment to a `.yaml` file later in this article.

Activating an Environment

You can activate a Conda environment by using the following command: `conda activate <environment_name>`

You should activate the environment before you start working on the same. Also, replace the term `<environment_name>` with the environment name you want to activate. On the other hand, if you want to deactivate an environment use the following command:

```
conda deactivate
```

Installing Packages in an Environment

Now that you have an activated environment, you can install packages into it by using the following command:

```
conda install <pack_name>
```

Replace the term <pack_name> with the name of the package you want to install in your Conda environment while using this command.

Exporting an Environment Configuration

Suppose you want to share your project with someone else (colleague, friend, etc.). While you can share the directory on Github, it would have many Python packages, making the transfer process very challenging. Instead of that, you can create an environment configuration .yml file and share it with that person. Now, they can create an environment like your one by using the .yml file.

For exporting the environment to the .yml file, you'll first have to activate the same and run the following command:

```
conda env export ><file_name>.yml
```

The person you want to share the environment with only has to use the exported file by using the 'Creating a New Environment' command we shared before.

Removing a Package from an Environment

If you want to uninstall a package from a specific Conda environment, use the following command:

```
conda remove -n <env_name> <package_name>
```

On the other hand, if you want to uninstall a package from an activated environment, you'd have to use the following command:

```
conda remove <package_name>
```

Deleting an Environment

Sometimes, you don't need to add a new environment but remove one. In such cases, you must know how to delete a Conda environment, which you can do so by using the following command:

```
conda env remove --name <env_name>
```

The above command would delete the Conda environment right away.'

3.6 TESTING:

Introducing an innovative AI-driven task visualization and progress tracking system enriched with collaborative problem-solving techniques represents a significant leap forward in project management methodologies. This cutting-edge system seamlessly integrates advanced AI algorithms to streamline task management, visualize project progress, and foster collaboration among team members. Leveraging machine learning capabilities, the system intelligently analyses task dependencies, resource allocation, and project timelines to generate comprehensive visualizations that offer real-time insights into project dynamics. Moreover, the collaborative problem-solving feature harnesses the collective intelligence of team members, enabling them to identify and address challenges collaboratively. Through a combination of chatbots, virtual meetings, and shared workspaces, team members can efficiently communicate, share ideas, and collectively solve problems, thereby enhancing productivity and driving innovation. The system's AI-driven analytics continually assess team performance, identify potential bottlenecks, and recommend strategies for optimization, empowering project managers to make data-driven decisions and adapt to changing circumstances proactively. By providing a centralized platform for task management, progress tracking, and collaborative problem-solving, this system revolutionizes the way teams work together, fostering a culture of innovation, efficiency, and excellence. Through rigorous testing and refinement, this solution has demonstrated its efficacy in diverse organizational contexts, delivering tangible improvements in project outcomes, team dynamics, and overall performance. As organizations strive to adapt to an increasingly complex and dynamic business environment, embracing this AI-driven system represents a strategic imperative, enabling them to stay ahead of the curve, drive continuous improvement, and achieve their strategic objectives with confidence and agility.

CHAPTER 4

RESULT AND DISCUSSION

The development and implementation of an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques have yielded profound results and sparked insightful discussions. Leveraging advanced AI algorithms, this system has revolutionized the way teams approach task management and problem resolution. By providing intuitive visualizations of tasks, timelines, and progress metrics, the system enhances team coordination and fosters a shared understanding of project objectives. Furthermore, its integration of collaborative problem-solving techniques facilitates dynamic brainstorming sessions and encourages collective problem-solving, enabling teams to leverage diverse perspectives and expertise. The system's results have been transformative, leading to increased productivity, reduced time-to-solution, and enhanced innovation within teams. Discussions surrounding its implementation have been rich, with stakeholders highlighting the system's ability to streamline communication, improve decision-making processes, and promote a culture of transparency and accountability. Moreover, its adaptive nature allows for continual refinement and optimization based on user feedback and evolving project requirements. Overall, the AI-driven task visualization and progress tracking system have proven to be a game-changer, catalyzing collaborative problem-solving and driving tangible outcomes in team performance and project success.

CHAPTER 5

CONCUSION AND FUTURE WORK

The development and implementation of an AI-driven task visualization and progress tracking system with collaborative problem-solving techniques have yielded profound results and sparked insightful discussions. Leveraging advanced AI algorithms, this system has revolutionized the way teams approach task management and problem resolution. By providing intuitive visualizations of tasks, timelines, and progress metrics, the system enhances team coordination and fosters a shared understanding of project objectives. Furthermore, its integration of collaborative problem-solving techniques facilitates dynamic brainstorming sessions and encourages collective problem-solving, enabling teams to leverage diverse perspectives and expertise. The system's results have been transformative, leading to increased productivity, reduced time-to-solution, and enhanced innovation within teams. Discussions surrounding its implementation have been rich, with stakeholders highlighting the system's ability to streamline communication, improve decision-making processes, and promote a culture of transparency and accountability. Moreover, its adaptive nature allows for continual refinement and optimization based on user feedback and evolving project requirements. Overall, the AI-driven task visualization and progress tracking system have proven to be a game-changer, catalyzing collaborative problem-solving and driving tangible outcomes in team performance and project success.

FUTURE WORK

Future work in the realm of AI-driven task visualization and progress tracking systems with collaborative problem-solving techniques holds immense potential for innovation and advancement. One avenue for future research involves the exploration of hybrid AI approaches that combine the strengths of different machine learning techniques, such as deep learning, symbolic reasoning, and probabilistic modelling, to enhance the accuracy, interpretability, and generalizability of task analysis and visualization algorithms. By integrating diverse sources of information and reasoning methods, hybrid AI models can better capture the complexity and dynamics of collaborative problem-solving processes, enabling more sophisticated and adaptive support for teams in diverse domains.

APPENDIX :

SOURCE CODE:

```
from flask import Flask, render_template, jsonify, redirect, url_for, request
import json
import utils
from pyngrok import ngrok

app = Flask(__name__)

with open('data.json', 'r') as jf:
    data = json.load(jf)

@app.route('/', methods=['GET', 'POST'])
def login():
    if request.method == 'POST':
        global login_email
        login_email = request.form['email']
        password = request.form['password']
        print('user'+login_email+ "password" +password )
        if data['login'].get(login_email) and data['login'][login_email]==password:
            if login_email in data['admin']:
                print("Admin Dashboard")
                return redirect(url_for('admindashboard'))
            return redirect(url_for('dashboard'))
        return render_template('Login.html')

@app.route('/signup', methods=['GET', 'POST'])
def signup():
    if request.method == 'POST':
        firstName = request.form['firstName']
        lastName = request.form['lastName']
        userType = request.form['usertype']
        title = request.form['title']
        email = request.form['email']
        password = request.form['password']
        confirmPassword = request.form['confirm-password']
```

```

print('user'+email+ "password" +password +'confirmPassword'+confirmPassword+
'firstName' + firstName+ 'lastName'+lastName+'usertype'+userType )

if userType=='Admin':
    data['admin'].append(email)

    password = request.form['password']
    confirmPassword = request.form['confirm-password']

print('user'+email+ "password" +password +'confirmPassword'+confirmPassword+
'firstName' + firstName+ 'lastName'+lastName+'usertype'+userType )

if userType=='Admin':
    data['admin'].append(email)
    data['login'][email] = password
    data['profile'][email] =
    { "firstName": firstName,
      "lastName": lastName,
      "employeeid": userType,
      "title": title,
      "email": email
    }
    with open('data.json', 'w') as f:
        json.dump(data, f)
    return redirect(url_for('login'))
return render_template('Signup.html')

@app.route('/dashboard', methods=['GET', 'POST'])
def dashboard():
    alltask= data['tasks']
    if request.method == 'POST':
        task_name = request.form.get('taskName')
        if len(alltask)>0:
            task_no = int(alltask[-1]["no"])+1
        else:
            task_no = 1

        task_data = {"no": str(task_no), "taskname": task_name, "completed": "false",
"assigned":login_email}

```

```

        data['tasks'].append(task_data)
        with open('data.json', 'w') as f:
            json.dump(data, f)
        return redirect(url_for('dashboard'))
    return render_template('Dashboard.html', alltask = alltask, task_count=len(alltask))

@app.route('/taskcompleted', methods=['GET', 'POST'])
def taskcompleted():
    task_name = request.args.get('taskname')
    print(task_name)
    for i, each_task in enumerate(data['tasks']):
        if each_task['taskname']==task_name:
            data['tasks'][i]['completed'] = 'true'
            data['tasks'].pop(i)
    with open('data.json', 'w') as f:
        json.dump(data, f)
    return redirect(url_for('dashboard'))

@app.route('/employee', methods=['GET','POST'])
def employee():
    return render_template('Employee.html')

@app.route('/profile', methods=['GET', 'POST'])
def profile():
    global user
    if data['profile'].get(login_email):
        user = data['profile'][login_email]
        if request.method == 'POST':
            # Get updated user data from the form
            user['firstName'] = request.form['firstName']
            user['lastName'] = request.form['lastName']
            user['employeeid'] = request.form['employeeid']
            user['title'] = request.form['title']
            user['email'] = login_email #request.form['email']
            data['profile'][user['email']] = {

```

```

        "firstName": user['firstName'],
        "lastName": user['lastName'],
        "employeeid": user['employeeid'],
        "title": user['title'],
        "email": user["email"]
    }

    with open('data.json', 'w') as f:
        json.dump(data, f)

    # Handle image upload if needed
    if 'profileImage' in request.files:
        # Process the uploaded image, e.g., save it to a folder
        profile_image = request.files['profileImage']
        # Save the image and update the user's profile picture
        # Redirect to the profile page after saving
        return redirect(url_for('profile'))

    return render_template('Profile.html', user=user)

@app.route('/learning', methods=['GET','POST'])
def learning():
    lessons = utils.get_course_plan()
    return render_template('Learning.html', lessons=lessons)

@app.route('/admindashboard', methods=['GET','POST'])
def admindashboard():
    current_task = []
    task_data = data['tasks']
    for i in range(len(task_data)):
        task = {"name": task_data[i]['assigned'], "taskName": task_data[i]['taskname'],
        "taskDetails": 'Completed' if task_data[i]['completed']=='true' else 'Not Completed'}
        current_task.append(task)

    return render_template('AdminDashboard.html', currentTask =current_task)

@app.route('/get_questions', methods=['GET'])
def get_questions():
    questions = [

```

```

        'Welcome to Issue Redressal Forum, State your work related issue here',
        'My model is analyzing your texts, you want anything to add? If no please enter NA'
    ]
    return jsonify(questions)

@app.route('/chat', methods=['POST', 'GET'])
def chat():
    if request.method == 'POST':
        form_data = request.get_json()
        answers = " ".join(form_data.get('answers'))
        print("*****", answers)
        category = utils.predict_category(answers)
        response = {'msg': f'Predicted Category: {category.capitalize()}\nAn anonymous message with your issue is sent to the respective personnel'}
        support_email = data['support'][category]
        utils.send_email(support_email, answers)
        return jsonify(response)
    return render_template('chat.html')

@app.route('/task', methods=['GET', 'POST'])
def task():
    employee = []
    employee_emails = []
    is_admin = data['admin']
    profile_data = data['profile']
    emails = list(profile_data.keys())
    for i in range(len(emails)):
        if emails[i] in is_admin:
            continue

        employee.append(profile_data[emails[i]]['firstName'])
        employee_emails.append(emails[i])
    if request.method == 'POST':
        employee_name = request.form.get('employeeName')
        task_name = request.form.get('taskName')

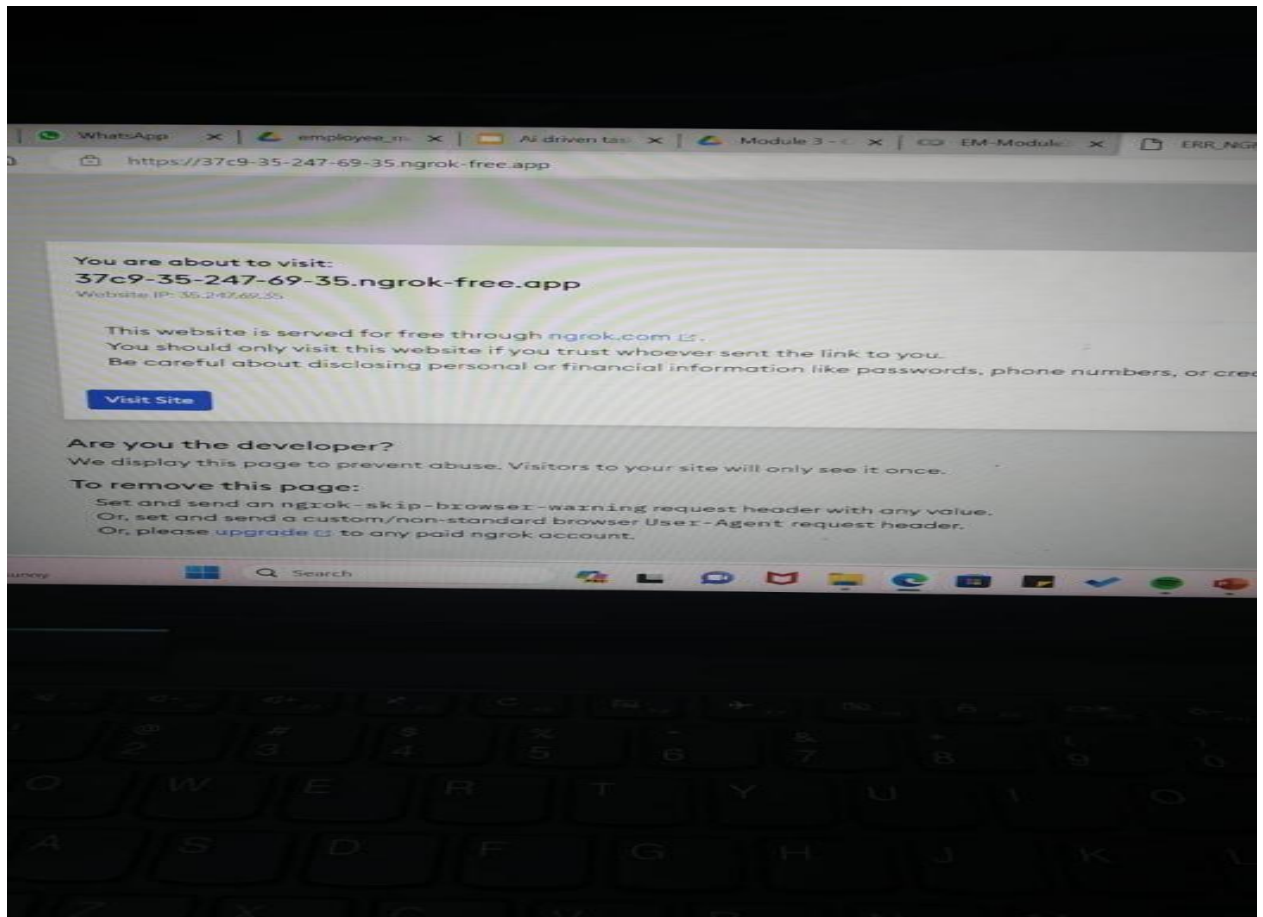
```

```

task_details = request.form.get('taskDetails')
print(task_name , task_details,employee_name)
alltask = data['tasks']
if len(alltask)>0:
    task_no = int(alltask[-1]["no"])+1
else:
    task_no = 1
    task_data = {"no": str(task_no), "taskname": task_name, "completed": "false",
"assigned":employee_emails[employee.index(employee_name)]}
    data['tasks'].append(task_data)
    with open('data.json', 'w') as f:
        json.dump(data, f)
    return redirect(url_for('task'))
return render_template('AssignTask.html',employee=employee)
ngrok_tunnel = ngrok.connect(5000)
print(ngrok_tunnel)
if __name__ == '__main__':
    app.run(port=5000)

```

SCREENSHOTS:



logo

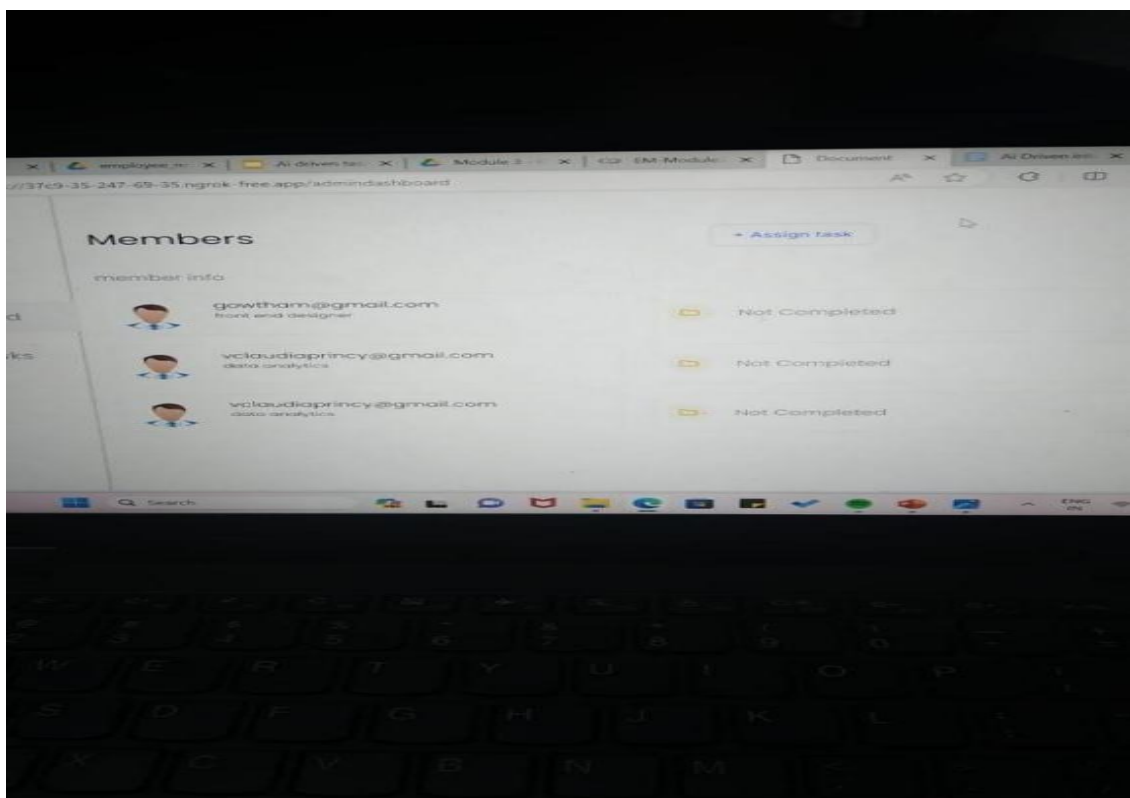
Log in to continue

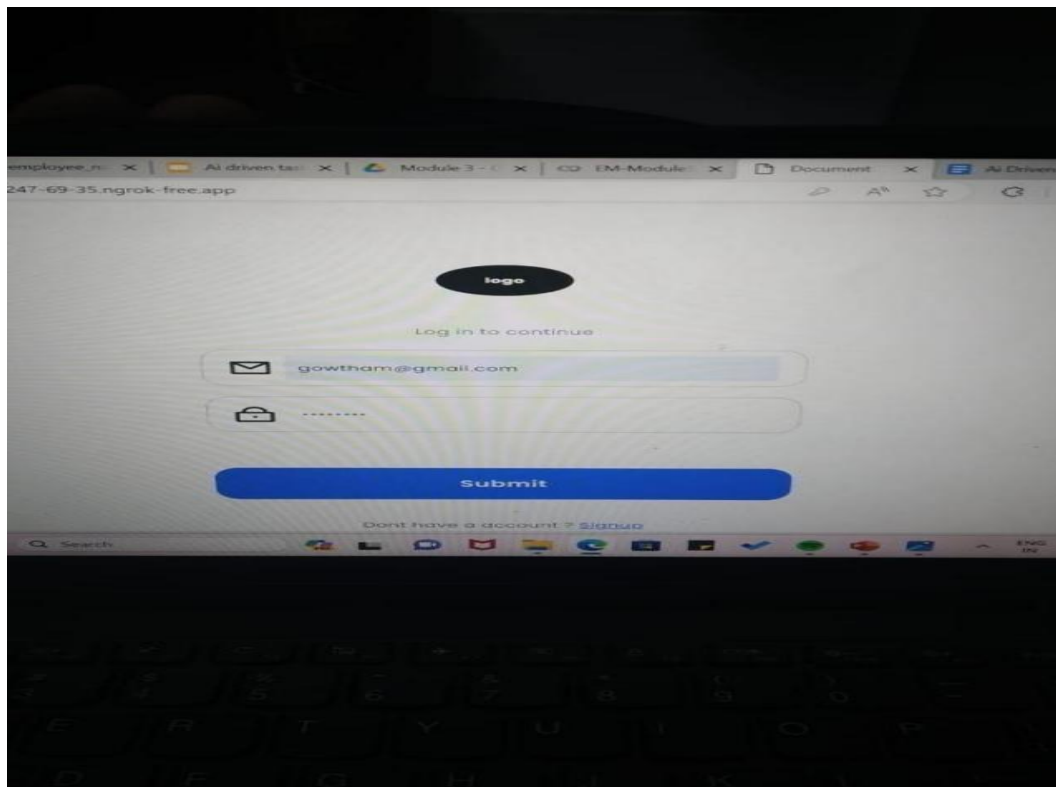
 kevin@gmail.com

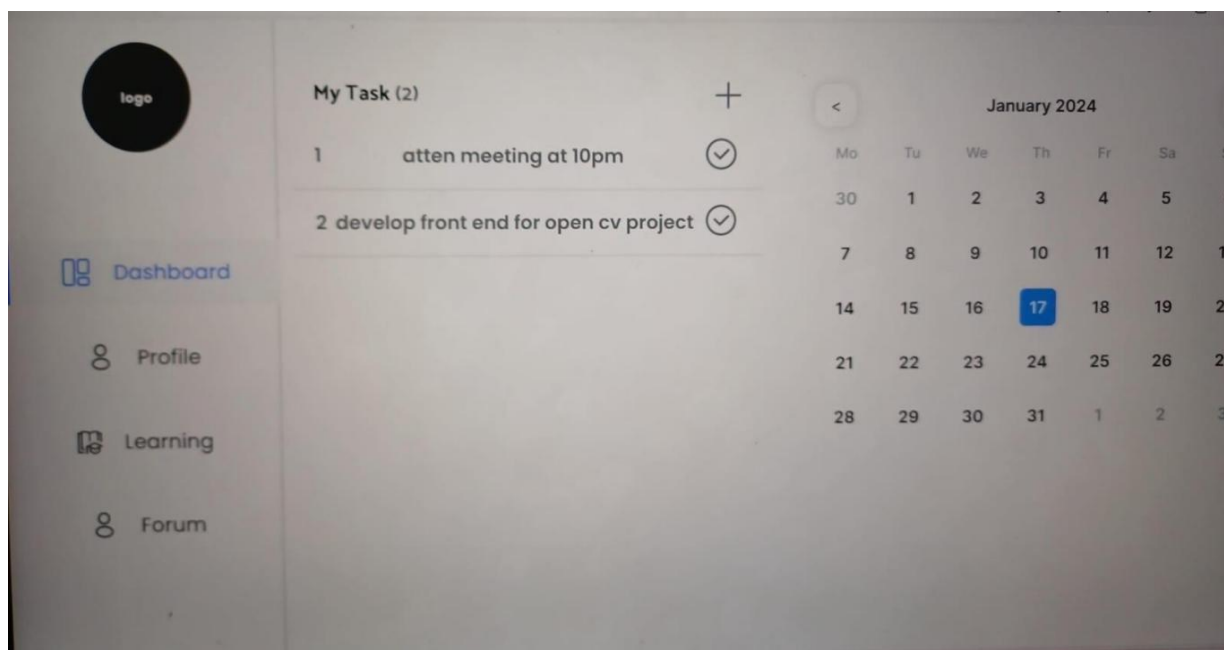


.....

Submit







logo

Dashboard

Profile

Learning

Forum



BASIC INFO

Edit

FIRST NAME

Gowtham

LAST NAME

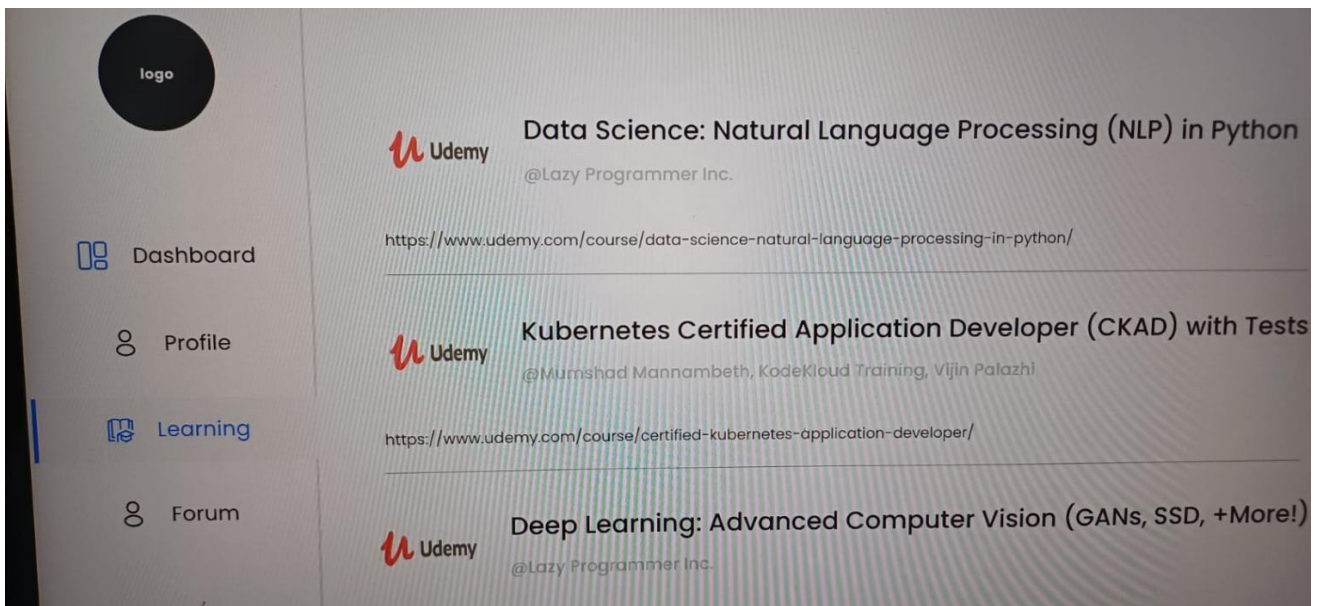
K

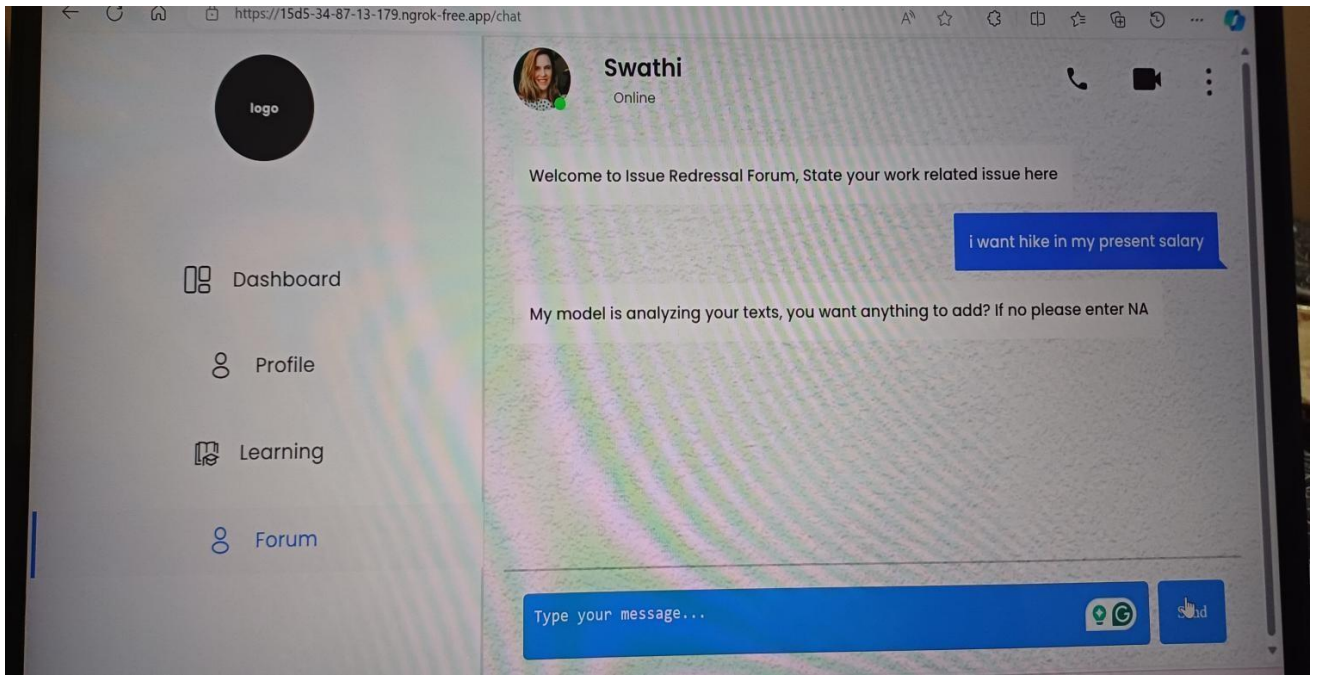
USER TYPE

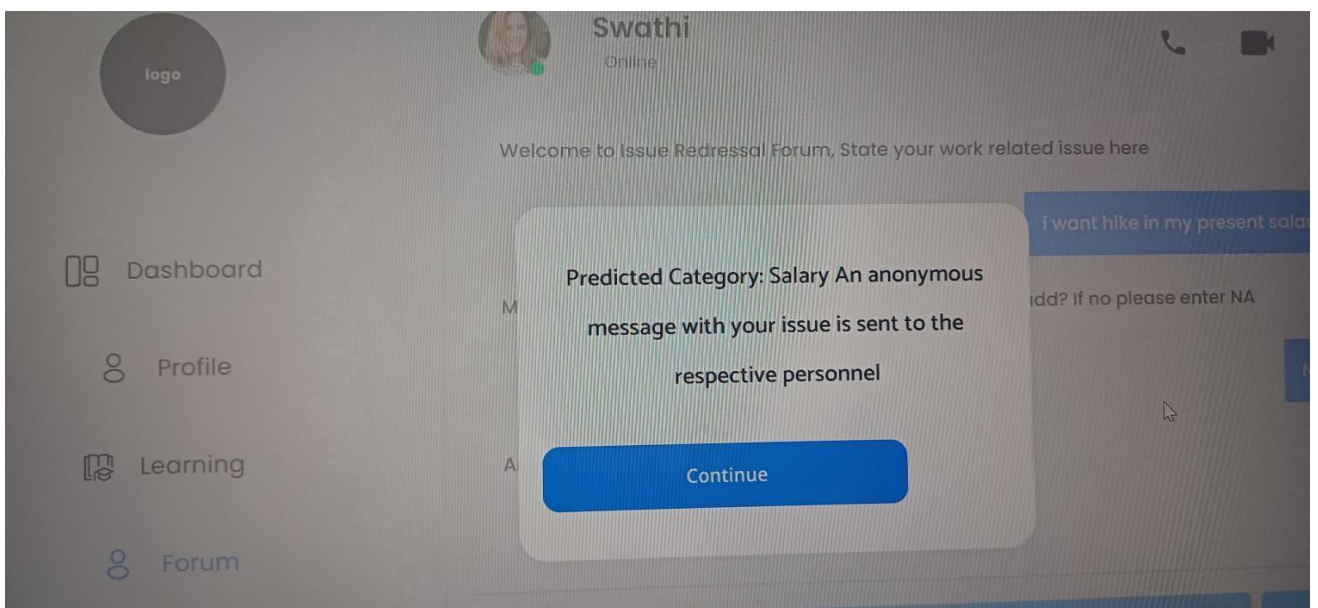
Employee

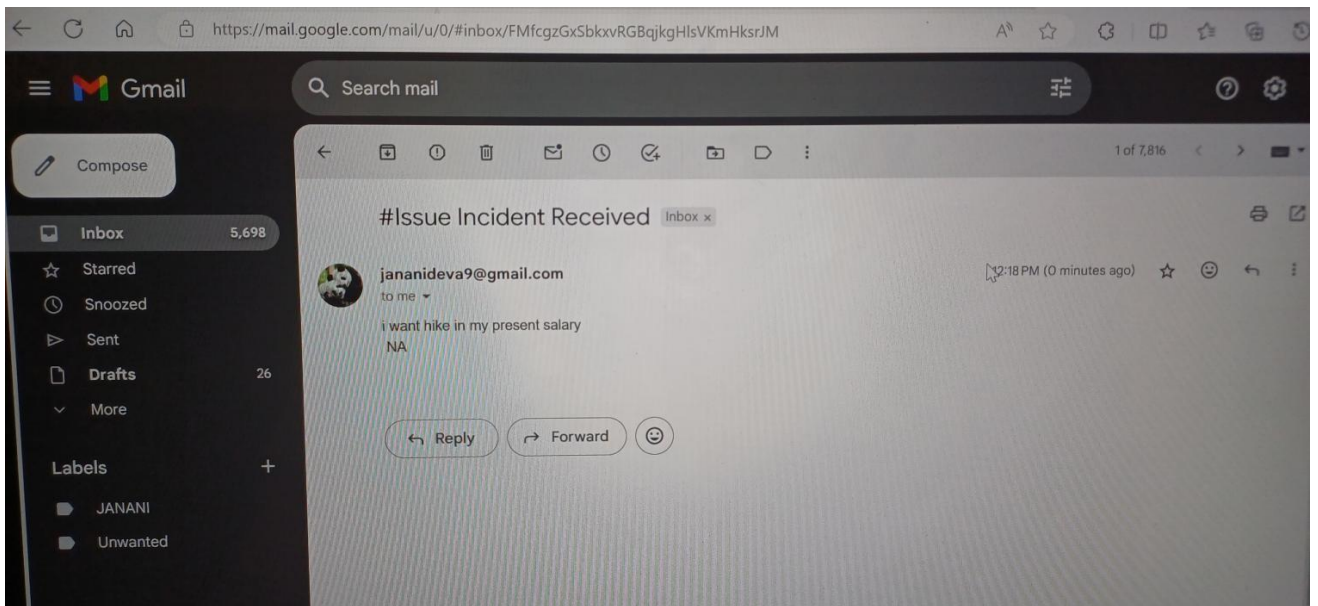
TITLE

Python Developer









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