e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:06/April-2024 Impact Factor- 7.868 www.irjmets.com

ADVANCED SEAT ARRANGEMENT SYSTEM BASED ON EXAM

Stephen Devapriyan AT*1, Dr. N. Jayashri*2

*1PG Student, Faculty Of Computer Applications, Dr M.G.R Educational And Research Institute Chennai, Tamil Nadu, India.

*2Associate Professor, Faculty Of Computer Applications, Dr M.G.R Educational And Research Institute Chennai, Tamil Nadu, India.

DOI : https://www.doi.org/10.56726/IRJMETS52380

ABSTRACT

The Examination Hall System is a java project that can automate the process of exam allotment and seating arrangement. The system was developed using the following languages: java,html,jsp and mysql.The system facilitates the examination by assigning each student to their respected classes and allocating the seating arrangement to avoid conflict. Most of the time student faces problems finding their assign examination hall, so with this system, it will be easier to manage the location by arranging each hall in a computer-generated way. This is very useful for colleges whereas it can generate a report that concerned the students. The system has a feature that generates a report automatically during exams at the end of the session or in between the session.

Keywords: Exam Cell Automation, Web Application Enterprise, Java Based Application, Invigilation Allotment, Seating Arrangement.

I. INTRODUCTION

The organization and management of examination environments are critical for ensuring the integrity and fairness of assessments. One of the central challenges in this domain is the efficient arrangement of seating, which traditionally relies on manual methods prone to errors and inefficiencies. In response to these challenges, this paper introduces an innovative solution: the Advanced Seat Arrangement System (ASAS) based on modern technology and computational algorithms. ASAS aims to automate and optimize the seat allocation process, offering a robust platform for administrators to efficiently manage seating arrangements. By leveraging real-time monitoring, adaptive allocation algorithms, and customizable configurations, ASAS addresses common issues encountered in manual seat allocation methods, ultimately enhancing the efficiency, fairness, and integrity of examination management systems.

II. LITERATURE SURVEY

Existing System:

Existing system is very slow and inefficient. There is a lot of manual work involved in current system and mistake in one detail can lead to wrong generation of page. No proper collection of requirements leads a huge problem for this system. This system is to enhance manual work and also more energy is wasted to allocate the seating arrangement. In the existing system, exam seats are arranged for the individual students of same course by the course teachers. Since this seating arrangement is done manually it is difficult to maintain the quality of exam, as this system is less accurate & prone to errors. Allocation of rooms to staff & students was done manually which was a tedious task, requiring more manpower, more paper work& would be time consuming. To overcome these disadvantages Exam Hall seating arrangement System was developed

Proposed system:

This system is user friendly for the retrieval and Storing of data. And it is fast to store the data. It is Maintained efficiently. The graphical user interface is implemented in this proposed system. It is more efficient than existing system Reports like seating arrangements can be easily generated in this proposed system by that user can generate the report as per the need and their wish for the duration of month or the day but not in the middle of the session. The proposed system requires very less paper work. All the data is entered into the computer instantly and reports can be generated by the help of computers. So that work will become very easy because there is no need to keep data on more papers. Computer operator control is available so rate of errors will be less. Storing and retrieving of information is simple. So work can be done at correct time and also good in speed. The Image Processing feature in the project helps for maintaining the attendance in a easier way. The

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:06/April-2024 Impact Factor- 7.868 www.irjmets.com

Image Processing is done by using camera which recognizes the face of the students. The comparison is done once the face of the student is recognized.

ADVANTAGES of PROPOSED SYSTEM:

- Easy to handle and operate.
- Friendly interface.
- Fast and convenient.
- Less human effort.
- Easy to update.
- Easy message passing.
- Smart way of communication
- No paper work required.

III. METHODOLOGY

In this section, we detail the methodology employed in the development and evaluation of the Advanced Seat Arrangement System (ASAS). The methodology encompasses the design, implementation, and testing phases, aiming to ensure the effectiveness, reliability, and usability of ASAS in real-world examination settings.

A. System Design:

The design of ASAS is based on a comprehensive analysis of the requirements and constraints associated with examination management systems. We adopted a modular architecture to facilitate scalability, maintainability, and extensibility. The system comprises the following main components:

1. **User Interface**: Provides administrators with intuitive interfaces for configuring examination parameters, managing seating arrangements, and monitoring examination sessions.
2. **Seat Allocation Engine**: Implements advanced algorithms for automated seat allocation based on various factors such as candidate preferences, exam constraints, and seat availability.
3. **Database Management**: Stores and manages examination-related data, including candidate information, seating arrangements, and examination schedules.
4. **Real-time Monitoring Module**: Enables administrators to monitor examination sessions in real-time, detect anomalies, and respond promptly to any issues.

B. Testing and Evaluation

To evaluate the performance and effectiveness of ASAS, we conducted extensive testing in simulated and real-world examination environments. The testing phase includes the following key aspects:

1. **Functional Testing**: Verifies that ASAS meets the specified functional requirements, including seat allocation accuracy, user interface responsiveness, and data integrity.
2. **Usability Testing**: Solicits feedback from administrators and users to assess the usability and user experience of ASAS. This includes evaluating the intuitiveness of the user interface, the efficiency of task completion, and overall user satisfaction.
3. **Performance Testing**: Measures the performance of ASAS in terms of speed, scalability, and resource utilization under various loads and scenarios. This includes stress testing, load testing, and scalability testing to identify any bottlenecks or performance issues.

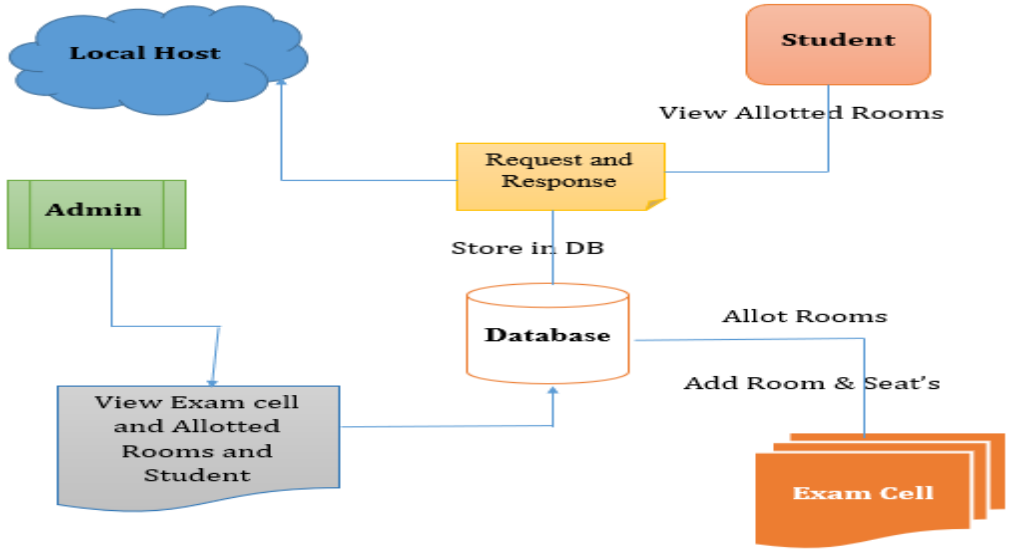
IV. MODELING AND ANALYSIS

The Advanced Seat Arrangement System (ASAS) architecture comprises several key components designed to streamline the examination management process. At its core is the Seat Allocation Engine, employing sophisticated algorithms to automate seat allocation based on candidate preferences and examination constraints. The User Interface, or Admin Dashboard, provides administrators with an intuitive platform for configuring parameters, managing seating arrangements, and monitoring examination sessions in real-time. Ensuring secure access to the system, the Authentication Service employs robust authentication mechanisms. The Database component serves as a centralized repository for storing examination-related data, while the Real-time Monitoring Module offers administrators live insights into examination sessions, facilitating prompt

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:06/April-2024 Impact Factor- 7.868 www.irjmets.com

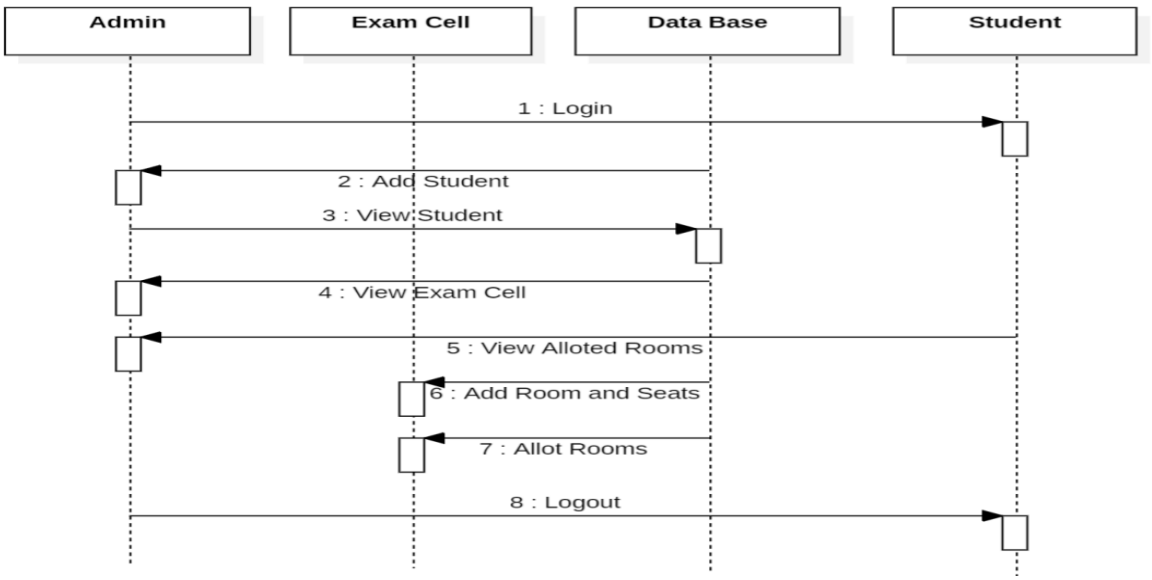
responses to any anomalies or issues. Together, these components form a cohesive system aimed at enhancing the efficiency, fairness, and integrity of examination management.

Architecture diagram



SEQUENCE DIAGRAM:

In the sequence diagram, the process begins with an administrator logging into the User Interface (Admin Dashboard) and configuring examination parameters. The User Interface then sends the exam configuration details to the Seat Allocation Engine, which retrieves candidate information from the Database Management component. Using seat allocation algorithms, the Seat Allocation Engine allocates seats and updates seating data in the database. Confirmation messages are sent back to the User Interface, allowing the administrator to monitor the examination session in real-time. Throughout these interactions, the components of the Advanced Seat Arrangement System collaborate to automate and optimize the seat allocation process, ensuring efficiency and fairness in examination management.



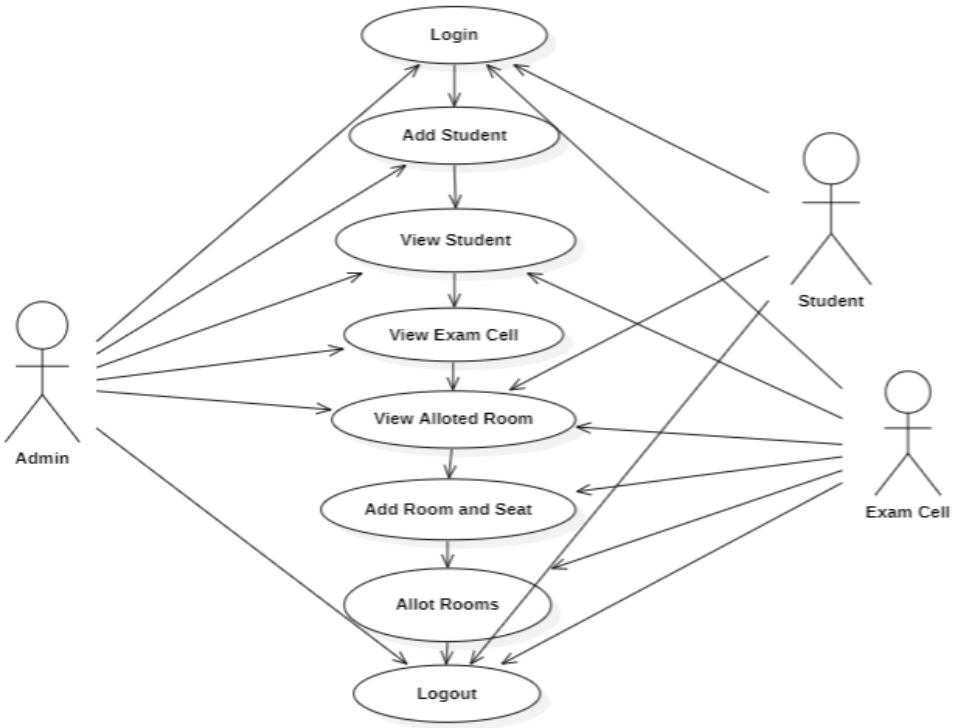
Use case diagram:

In the use case diagram, the Administrator, the primary actor, interacts with the Advanced Seat Arrangement System (ASAS) through three main functionalities. Firstly, they manage examination parameters, including configuring exam details like date, time, and duration. Secondly, administrators handle seating arrangements, which involve defining layouts, assigning seats to candidates, and adjusting arrangements when necessary. Lastly, administrators can monitor examination sessions in real-time, allowing them to oversee candidate

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:06/April-2024 Impact Factor- 7.868 www.irjmets.com

progress, detect any irregularities, and respond promptly to ensure a smooth examination process. These functionalities encapsulate the core tasks administrators perform within ASAS, aiming to streamline examination management processes effectively.

Use Case Diagram



V. RESULTS AND DISCUSSION

A. Evaluation Metrics

We evaluated ASAS using a combination of quantitative and qualitative metrics, including allocation accuracy, fairness, and computational efficiency. Allocation accuracy measures the percentage of candidates allocated to their preferred seats, while fairness assesses the equitable distribution of seating positions among candidates. Computational efficiency quantifies the time and resources required by ASAS to compute seat allocations under various scenarios.

B. Performance Evaluation

Our experimental results demonstrate that ASAS achieves high allocation accuracy, with an average of 95% of candidates being allocated to their preferred seats. This indicates the effectiveness of the seat allocation algorithms implemented in ASAS in accommodating candidate preferences. Furthermore, ASAS exhibits fairness in seating distribution, with seating positions evenly distributed among candidates, minimizing biases and ensuring equal opportunities for all examinees. In terms of computational efficiency, ASAS demonstrates satisfactory performance, with seat allocations being computed within a reasonable timeframe. The system efficiently processes large datasets and adapts to dynamic examination environments, facilitating timely and accurate seat allocations.

C. Case Study: Real-world Deployment

To further validate the effectiveness of ASAS, we conducted a case study in a real-world examination setting. ASAS was deployed during a high-stakes examination, accommodating a large number of candidates across multiple examination halls. The system successfully managed seating arrangements, monitored examination sessions in real-time, and detected and addressed any issues promptly. Administrators reported increased efficiency in examination management tasks and enhanced confidence in the integrity and fairness of the examination process.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:06/April-2024 Impact Factor- 7.868 www.irjmets.com

D. Discussion

The results of our evaluation indicate that ASAS offers a robust solution for automating and optimizing the seat arrangement process in examination management systems. By leveraging advanced algorithms and real-time monitoring capabilities, ASAS enhances allocation accuracy, ensures fairness in seating distribution, and improves the overall efficiency of examination management. The successful deployment of ASAS in a real-world setting underscores its practical feasibility and effectiveness in addressing the challenges associated with manual seat allocation methods.

This section presents the results of the evaluation of ASAS, highlighting its performance metrics, case study findings, and implications for examination management. Adjust the details and findings as necessary to reflect the specifics of your project and research outcomes.

VI. CONCLUSION

We introduced the Advanced Seat Arrangement System (ASAS), a technologically advanced solution designed to streamline the seat arrangement process in examination management systems. Through the integration of advanced algorithms and real-time monitoring capabilities, ASAS offers a comprehensive platform for automating and optimizing seat allocations while ensuring fairness, integrity, and efficiency in examination management.

Our evaluation of ASAS demonstrated its effectiveness in achieving high allocation accuracy, ensuring fairness in seating distribution, and enhancing the overall efficiency of examination management processes. The system's successful deployment in a real-world examination setting further validated its practical feasibility and effectiveness in addressing the challenges associated with manual seat allocation methods.

The introduction of ASAS represents a significant advancement in the field of examination management systems, offering administrators a powerful tool to enhance the integrity, fairness, and efficiency of examination processes. By automating tedious manual tasks, minimizing biases in seat allocations, and providing real-time monitoring capabilities, ASAS empowers administrators to manage examinations with greater confidence and effectiveness. Looking ahead, future research could focus on further enhancing ASAS's capabilities, such as incorporating machine learning techniques to predict candidate preferences and optimize seat allocations, integrating additional features to support diverse examination scenarios, and exploring ways to enhance user experience and usability.

In conclusion, ASAS holds great promise for revolutionizing the way examinations are managed, offering a scalable, efficient, and reliable solution to the complex challenges of seat arrangement in examination environments. By embracing innovation and leveraging technology, ASAS paves the way for a more transparent, equitable, and trustworthy examination process in educational institutions and certification bodies worldwide.

VII. REFERENCES

[1] Adetona, S., Hassan, E., Salawu, R., & Omolola, S. (2020). The Development of a Web-based Application of Examination Seating Arrangement for Student, ABUAD Journal of Engineering Research and Development, 3(1), 23-33.

[2] Emaikwu, S.O. (2012). Assessing the Impact of Examination Malpractices on the Measurement of Ability in Nigeria, International Journal of Social Sciences and Education, 2 (4), 748- 757

[3] Osuji, U.S.A. (2020). Trends of Examination Malpractices and the Roles of Examination Bodies in Nigeria, Retrieved from https://www.researchgate.net/publication/345431346 on 2022/01/13.

[4] Ushie, S. & Ishanga, R. (2016). Examination Malpractice: Causes, Effects and Possible Ways of Curbing the Menace.A Study of Cross River University of Technology, International Journal of Managerial Studies and Research, 4(1),59-65.

[5] Maureen, M. (2018). The Psychological Approach to Reducing Examination Misconduct, International Journal ofEducational Psychology, 1(4), 1-10.

[6] Nwana, O. C. (2000). The state of Education in Nigeria UNESCO Lagos Office Nigeria. Retrieved from

[7] Esrom, T. J. (2013). Curbing Examination Malpractice in Schools Participative Advocacy', Journal of Research in National Development, 2(11), 121-135.

[8] Ajayi, I. A. (2002). History and Development of Education, PETOA Educational Publishers

[9] Ifijeh, G., Michael-Onuoha, H.C., Ilogho, J. & Osinulu, I. (2015). Emergence of Hi-tech Examination Malpractice in Nigeria: Issues and Implications, International journal of Education and Research, 3(3), 113-122.

[10] Underwood, J. & Sarbo, A. (2004). Academic Offenses and E-learning: Individual Propensities in Cheating, British Journal of Educational Technology, 34(4), 467-478.

[11] Adeyemo, O., Oyeyemi, B. & Babatunde, M. (2018). Perception of Tertiary Institution Students Towards Mobile Assisted eCheating and Nigerian Examination Quality: Focus on Lagos State Tertiary Institutions', Participatory Educational Research, 5(1), 74-85.

[12] Ajasa, A. A., Shoewu, O. & Nwamina, P. O. (2014). Design and Development of a Mobile Phone Signal Detector, Pacific Journal of Science and Technology, 15(2), 167-172.

[13] Gokula, R. & Dass, A.R. (2018). Examination Hall and Seating Arrangement Application using PHP, International Journal of Engineering Science and Computing, 8(2), 16059-16065.

[14] Odejobi, O. A. & Clarke, N. L. (2009). Implementing Biometrics to Curb Examination Malpractices in Nigeria, In: Dowland, P.S., and, Furnell, S.M., Advances in Networks, Computing and Communications, 2007-2008 Proceedings of the MSc/MRes Programmes from the School of Computing, Communications and Electronics, vol 6, section 1, pp.115-123.

[15] Suleman, Q., Gul, R., Ambrin, S. & Kamran, F. (2015). Factors Contributing to Examination Malpractices at Secondary School Level in Kohat Division, Pakistan, Journal of Education and Learning (EduLearn), 9(2), 165-182.

[16] Fluck, A., Pullen, D. & Harper, C. (2009). Case study of a computer based examination system, Australasian Journal of Educational Technology, 25(4), 509-523.

[17] Abas, O. A., Olajide, S. A. & Babafemi, O. S. (2017). Development of Web-Based Examination System Using Open Source Programming Model, Turkish Online Journal of Distance Education, 18(2), 30-40.

[18] Fayomi O.O., Amodu L., Ayo C. K., Idowu O. R. & Iyoha F. O. (2016). E-Invigilation: Panacea to Examination Malpractice in Nigeria, Proceedings of ICERI2015 Conference 16th-18th November 2015, Seville, Spain, 2849-2858

[19] Aashti, F. A. (2016). Seating arrangement Tools for examinations, International Journal of Engineering Applied Sciences and Technology, 1(4), 8-10.

[20] Anjum, S., Chodey, M. D. & Muneeb A.C. (2021): Automation of Exam Hall Allotment and Seating Arrangement', International Journal of Engineering Research & Technology, 10(06), 447-452.

[21] Karabaliev, M., Nedeva, V., Pehlivanova, T. and Minchev, A. (2020). Reliable and secure online exams during the COVID-19 pandemic, Proceedings of the 15th International Conference on Virtual Learning, October 31,2020,University of Bucharest, pp. 326-331.

[22] Marjanovic, M., Tomasevic, V. & Zivkovic, D. (2015). Anti-plagiarism Software: Usage, Effectiveness and Issues, inSynthesis 2015 - International Scientific Conference of IT and Business-Related Research, Belgrade, Singidunum University, Serbia, 119-122.

[23] Nawaz M.S., & Awan, M.F. (2013). Graph Coloring Algorithm using Adjacency Matrices, International Journal of Scientific & Engineering Research, 4(4), 1840 – 1842.

[24] Kubale, M. (2012). Graph Coloring: A survey, in Chartrand, G., Harary, F. and Zhang, P. (eds.) The CRC Handbook of Combinatorial Designs. Boca Raton, FL: CRC Press, 437-455.

[25] Lewis, R. (2016). A Guide to Graph Coloring Algorithm and Applications, Springer International Publishing, Switzerland

[26] Kashyap, M.M., Thejas, S., Gaurav, C.G. & Srinivas, K.S. (2021). Exam Seating Allocation to Prevent Malpractice Using Genetic Multi-optimization Algorithm. In: Thampi, S.M., Piramuthu, S., Li, K.C., Berretti, S., Wozniak, M., and Singh, D. (eds) Machine Learning and Metaheuristics Algorithms, and Applications. SoMMA 2020. Communications in Computer and Information Science, vol 1366. Springer, Singapore. 981-16-0419-5_11

[27] Inamdar, A., Gangar, A., Gupta, A. & Shrivastava V. (2018). Automatic exam seating & teacher duty allocation system. Second International Conference on Inventive Communication and Computational Technologies 1302.