AJEMA GLOBAL RESEARCH NETWORK

AMERICAN Journal of Engineering, Mechanics and Architecture
Volume 3, Issue 2, 2025 ISSN (E): 2993-2637

The Educational Effectiveness of Reading and Understanding Letters or Orders Received at a University using Artificial Intelligence and Intelligently Directing them to Departments

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Abstract: This article presents the opinions of domestic and foreign scientists on using artificial intelligence to read and understand letters or orders received at universities and intelligently direct them to departments. Using AI to read and understand letters or orders received at a university and intelligently direct them to the appropriate departments is a great use of natural language processing (NLP) and automation. Using artificial intelligence to read and understand letters or orders received at a university and then intelligently direct them to the appropriate departments can streamline operations, improve efficiency, and reduce human error.

Keywords: Recognition of Text (OCR), Text Analysis Using Natural Language Processing (NLP) Techniques, User Interface Dashboard, Search and Filter Options, Observation and Upkeep, Orders and letters can arrive in a variety of formats, including faxes, scanned photos, emails, PDFs, and physical mail.

Introduction.

Administrative efficiency may be significantly increased at universities by implementing artificial intelligence (AI) to improve the reading, comprehension, and direction of letters or instructions received. The following are some useful elements and tactics to think about:

NLP, or natural language processing

Text Analysis: Read and examine incoming letters using natural language processing (NLP) methods. This enables the system to retrieve important data, including sender information, topic content, due dates, and particular requests.

Intent Recognition: To enable proper routing, AI can categorize the communication's intent (such as an academic question, administrative request, or complaint).[1]

Classification and Labeling

Automated Tagging: This feature allows for faster system searches and retrieval by automatically assigning tags or categories to letters depending on their content.

[1] Manning, C. D., & Schütze, H. (1999). *Foundations of Statistical Natural Language Processing.*

Priority Levels: AI is able to determine the significance or urgency of letters and rank them in order of priority so they can move quickly via the proper channels.

Astute Routing

Departmental Mapping: To make sure that letters are sent to the right people, create an extensive map of departments and their roles. This may change dynamically as departmental requirements change.[2]

Machine Learning Algorithms: Use ML algorithms that gain knowledge from past data to gradually increase routing accuracy.

Materials.

Contextual Knowledge

Contextual Responses: The quality of the produced response is improved by AI's ability to comprehend contextual subtleties, such as academic jargon or particular institutional regulations.

Semantic Analysis: To understand the underlying meaning of letters, especially those that are difficult or technical, apply semantic analysis.

Improving the User Interface

Administrator Dashboards: Provide an easy-to-use dashboard that allows administrators to monitor incoming letters, their status, and the actions that have been performed.[3]

Feedback Mechanism: To improve the AI's learning process, incorporate a feedback mechanism that enables departments to offer suggestions on routing correctness.[4]

Integration with Current Frameworks

Seamless Integration: Verify that the AI system can easily interface with the university's current information management systems, such as ERP systems, to facilitate access to faculty profiles, student records, and other pertinent data.

Email and Document Management Systems: Simplify processes by utilizing AI capabilities in conventional email or document management systems.

Ongoing Education and Development

Data Feedback Loops: Create systems that allow the AI system to continually learn from fresh data, thereby increasing its accuracy.

Performance measures: Use measures like user happiness, response times, and routing correctness to evaluate the AI system's performance on a regular basis.

Adaptation and Training

Programs for Staff Training: Provide personnel with instruction on how to use AI tools and decipher AI-generated outputs.

Customizable Models: Modify AI models to accommodate various academic departments' or institutions' particular needs and communication preferences.[5]

Compliance and Security

Data privacy: Use strong encryption and access restrictions to make sure the AI system conforms with data protection laws (such as the GDPR).

Monitoring and Auditing: To ensure accountability and transparency, set up monitoring mechanisms to examine AI decision-making procedures.

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[2] Ray, R. (2012). *OCR with OpenCV and Tesseract on Linux.*

[3] Smith, R. (2007). *An Overview of the Tesseract OCR Engine.*

[4] Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning.*

[5] Vaswani, A., et al. (2017). *Attention Is All You Need.*

AI has the potential to completely transform how letters and orders are processed at universities, resulting in more accurate and efficient routing to the right departments.

Research and methods.

Traditional Letter Processing's Drawbacks

Manual Sorting: Sorting incoming mail by hand takes a lot of time for university employees. This can postpone important activities and is time-consuming and prone to errors.[6]

Inconsistent Labeling: Older language or unclear department information may be used in letters.

Multiple Formats: Digital forms, faxes, emails with attachments, and physical letters are just a few of the formats in which incoming correspondence can be sent.

Levels of Urgency: Certain letters, such as grant applications or student appeals, must be answered right away.

Language Barriers: Letters in several languages are frequently sent to universities with partnerships and overseas students.

Effective Aspects of AI's Assistance:

AI may solve these issues and produce a more efficient system in the following ways:

1. Intelligent OCR and NLP Content Extraction:

OCR, or optical character recognition, is an AI-powered technology that automatically transforms scanned pictures of PDFs, faxes, and actual letters into machine-readable text. Manual data input is no longer necessary as a result.

NLP, or natural language processing:

Text Understanding: NLP algorithms are able to recognize keywords, phrases, and the main goal of the communication by comprehending the context and meaning of the text included in the letters.

Entity Recognition: AI is able to recognize particular entities that are referenced in the text, including:

For example, "Admissions," "Financial Aid," and "Research Office" are departments.

Individuals: (for instance, "Professor Smith," "Dr. Jones")

Programs and Courses: (for example, "Computer Science," "MBA")

(For example, "November 1st," "urgent request") Dates and Deadlines[7]

Numbers for cases or references, such as "Student ID" or "Grant Proposal Number"

Sentiment Analysis: AI is even capable of identifying urgent requests or grievances by analyzing the text's tone.

Multi-Format Handling: Emails, PDFs, forms, and physical letters should all be handled by the system with ease.

Results.

Classification and Routing Intelligence:

Models for Classification in Machine Learning (ML): Machine learning algorithms that have been trained on historical data of properly routed letters are able to recognize trends and automatically categorize new letters into pre-established groups (e.g., department, urgency level, topic).[8]

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[6] Devlin, J., et al. (2018). *BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding.*

[7] Sebastiani, F. (2002). *Machine Learning in Automated Text Categorization.*

[8] Joachims, T. (1998). *Text Categorization with Support Vector Machines: Learning with Many Relevant Features.*

Rule-Based Systems: As an adjunct to machine learning, rules may be set up according to senders, known keywords, or certain situations to guarantee correctness.

Confidence Scores: To show how reliable its predictions are, the AI system ought to offer confidence scores for each categorization. Cases with low confidence might be marked for human review.

Prioritization: The system can order the processing of important documents according to the levels of urgency that have been determined.

Dynamic Routing: The system need to be able to adjust to modifications in organizational structure, departments, or programs.[9]

Simplified Integration and Workflows:

Automated Workflow: After a letter has been classified, the system ought to send it straight to the digital inbox of the appropriate department, starting the appropriate processes (such as notifying the department head or creating a case file).

Integration with University Systems: The AI system ought to be able to work with the current learning management systems (LMS), document management platforms, and student information systems (SIS).[10]

consolidated Dashboard: All incoming letters, their status, and the departments to which they are allocated may be seen in real time on a consolidated dashboard.

Audit Trails: For compliance and accountability, the system need to keep track of every processing step.

Mobile Access: For more flexibility, correspondence management and access should be feasible on mobile devices.

Discussion.

Constant Learning and Improvement: Feedback Loops: Over time, the system's accuracy should increase as it learns from human input (such as fixing misrouted letters).

Data analysis: To find opportunities for improvement, examine processing times, mistake rates, and departmental response.

Model Retraining: To accommodate modifications in language, nomenclature, and academic protocols, retrain machine learning models on fresh data on a regular basis.[11]

AI-Powered Letter Processing Advantages:

Enhanced Efficiency: Shorter processing times and less manual effort.

Increased Accuracy: Fewer mistakes and misdirected letters.

Faster Response Times: Critical inquiries are handled more quickly.

Cost savings: Better resource allocation and lower labor expenses.

Improved Data Analysis: Using data insights to make better decisions.

Improved Faculty and Student Experience: More dependable and quicker service.[12]

Important Points to Remember:

Data security and privacy: safe management of private student and teacher data.

Explainability & Transparency: Gain insight into the AI's decision-making process.

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[9] Alhawiti, K. M. (2017). *Artificial Intelligence Technologies for Smart University Services.*

[10] Jain, A., & Saha, B. (2015). *Automation in Higher Education Using AI and Machine Learning.*

[11] Jurafsky, D., & Martin, J. H. (2021). *Speech and Language Processing* (3rd ed.).

[12] Devlin, J., et al. (2018). *BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding.*

person Oversight: Keep a person informed in delicate or complicated situations.

Scalability: The system must be able to manage increasing letter volumes.[13]

Conclusion.

Universities may increase communication efficacy, decrease administrative bottlenecks, and expedite workflows by utilizing AI to read, comprehend, and direct letters. To guarantee that the system satisfies changing requirements and maintains high levels of accuracy in routing and comprehending institutional communication, it is imperative that it undergo continuous adaptation and feedback mechanisms.[14]

Universities may create intelligent, effective, and streamlined systems by utilizing AI to replace their human, traditional letter-processing procedures. In the end, this benefits the company and the people it serves by improving organization, reaction times, and general efficiency.[15] Careful planning, data preparation, and a dedication to continuous maintenance and development are necessary for the implementation of such a system.

By using artificial intelligence (AI) to efficiently read, comprehend, and route letters or orders received at universities, administrative procedures may be streamlined, communication can be improved, and overall efficiency can be increased. Universities can increase operational efficiency, save manual labor, and improve departmental communication by utilizing AI technology[16] to read and comprehend letters or orders received at their institutions. In addition to streamlining administrative procedures, these tactics improve the experience for both employees and students.

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[15] Jain, A., & Saha, B. (2015). *Automation in Higher Education Using AI and Machine Learning.*

[16] Devlin, J., et al. (2018). *BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding.*