

BATCH NO:MAI17

**AI BASED MAGAZINE CREATOR AND PDF
GENERATOR**

*Major project report submitted
in partial fulfillment of the requirement for award of the degree of*

**Bachelor of Technology
in
Computer Science and Design**

By

**ADAPA BHARAT (21UEDL0004) (VTU21313)
MAHAMMAD SHAHEED (21UECE0008) (VTU20415)**

*Under the guidance of
Dr. M. KALAIMANI, M.E., Ph.D.,
ASSISTANT PROFESSOR*



**DEPARTMENT OF COMPUTER SCIENCE AND DESIGN
SCHOOL OF COMPUTING**

**VEL TECH RANGARAJAN DR. SAGUNTHALA R&D INSTITUTE OF
SCIENCE AND TECHNOLOGY**

(Deemed to be University Estd u/s 3 of UGC Act, 1956)

**Accredited by NAAC with A++ Grade
CHENNAI 600 062, TAMILNADU, INDIA**

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CERTIFICATE

It is certified that the work contained in the project report titled “AI BASED MAGAZINE CREATOR AND PDF GENERATOR” by ADAPA BHARAT (21UEDL0004), MAHAMMAD SHAHEED (21UECE0008) has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

Signature of Supervisor

Dr. M. Kalaimani

Assistant Professor

Computer Science and Design

School of Computing

Vel Tech Rangarajan Dr. Sagunthala R&D

Institute of Science and Technology

Signature of Head of the Department

Dr. R. Parthasarathy

Professor

Computer Science and Design

School of Computing

Vel Tech Rangarajan Dr. Sagunthala R&D

Institute of Science and Technology

Signature of the Dean

Dr. S P. Chokkalingam

Professor & Dean

School of Computing

Vel Tech Rangarajan Dr. Sagunthala R&D

Institute of Science and Technology

DECLARATION

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented, fabricated, or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the institute and can also evoke penal action from the sources that have thus not been properly cited or from whom proper permission has not been taken when needed.

ADAPA BHARAT

Date: / /

MAHAMMAD SHAHEED

Date: / /

APPROVAL SHEET

This project report entitled “AI BASED MAGAZINE CREATOR AND PDF GENERATOR” by ADAPA BHARAT (21UEDL0004), MAHAMMAD SHAHEED (21UECE0008) is approved for the degree of B.Tech in Computer Science and Design.

Examiners

Supervisor

Dr. M. Kalaimani,
Assistant Professor

Date: / /

Place:

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ADAPA BHARAT	(21UEDL0004)
MAHAMMAD SHAHEED	(21UECE0008)

ABSTRACT

The AI Based Automated Magazine Creator and PDF Generator is an innovative solution designed to streamline and automate the process of magazine creation. The system leverages Natural Language Processing (NLP) and image generation models to automatically generate articles, captions, and relevant images based on user defined topics or trending content. By integrating AI powered text summarization, language translation, and content enhancement techniques, the system ensures high quality and coherent magazine articles. Additionally, it employs dynamic layout design algorithms to arrange content and images in visually appealing formats, offering customizable templates and themes. The project also incorporates a PDF generation module, which automatically converts the designed magazine into a portable format, ensuring easy distribution and accessibility. The automation of the entire content generation and design process reduces the need for manual intervention, significantly improving efficiency and consistency. Furthermore, the system supports real time content curation, making it suitable for industries such as media, marketing, and education. By providing a scalable and customizable solution, the AI based magazine creator offers flexibility to cater to different content domains and aesthetic preferences. Its potential for generating personalized, professional grade magazines makes it a valuable tool for businesses, publishers, and content creators seeking to optimize their workflow and enhance productivity.

Keywords: **AI Magazine Generation, PDF Automation, Natural Language Processing (NLP), Content Generation, Automated Publishing, Dynamic Layout Design, Digital Media Production, Real time Content Curation, Customizable Templates, Scalable Content Creation.**

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LIST OF ACRONYMS AND ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
AWS	Amazon Web Services
CI/CD	Continuous Integration / Continuous Deployment
CMS	Content Management System
CSS	Cascading Style Sheets
GPT	Generative Pre-trained Transformer
HTTP	HyperText Transfer Protocol
HTML	HyperText Markup Language
IEEE	Institute of Electrical and Electronics Engineers
ISO/IEC	International Organization for Standardization / International Electrotechnical Commission
NLP	Natural Language Processing
PDF	Portable Document Format
SDG	Sustainable Development Goal

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Chapter 1

INTRODUCTION

1.1 Introduction

With the fast paced nature of today's online environment, content development is no only a requirement but a competitive marketplace where creativity, consistency, and time must be combined. Creating systematic, visually appealing, and informative content such as magazines requires a great amount of work by hand whether through ideation, writing, visual design, layout formatting, or delivery. For students, professionals, educators, and online publishers, the time and expertise needed to create such content pose a significant hurdle. With artificial intelligence transforming how we engage with technology, it presents the power to simplify and improve many of these time consuming creative processes.

The rise of large scale language models like GPT-4 (Generative Pre-trained Transformer-4) and the integration of powerful text to image generation & semantic search engines open new possibilities for intelligent systems that can simulate human like writing, recommend visuals, and output print ready material. With proper alignment of AI tools, it is now possible to input a simple idea or keyword and have the system expand it into a coherent article enriched with relevant images and visual elements.

The project titled AI Based Magazine Creator and PDF Generator leverages this evolving synergy between artificial intelligence and web development. It focuses on building a platform that enables users to generate full length magazine articles from a single query. The system utilizes generative AI models for content generation and image retrieval engines to enhance readability and design. Once generated, the content is styled into a magazine like layout, previewed on the frontend, and rendered as a downloadable PDF file.

1.2 Background

Traditional magazine creation is a multi stage process involving research, content writing, editing, image sourcing, graphic design, layout structuring, and final publishing. This process typically demands a team of skilled professionals using a variety of tools, such as Adobe InDesign, Photoshop, and content writing platforms. For individuals or small organizations, especially those with limited technical or design knowledge, creating a professional looking magazine is often an overwhelming and time consuming task.

But with the advances of Artificial Intelligence, especially natural language processing (NLP) and generative models, a new door had been opened. GPT-3 and GPT-4 can produce content that is similar to that of a human, while there are vision based systems as well as image APIs to get or even create images that are relevant to the content. Putting these features together into a modern day web application provides the promise of automating the entire magazine generating activity. With frameworks such as Next.js and deployment platforms such as Vercel, developers can provide this experience through scalable, user friendly, as well as responsive interfaces, making the generation of magazine possible for a much wider audience.

1.3 Objective

The central goal of the project is to create a smart system that can transform a user's basic query or subject matter into a professionally formatted digital magazine. This platform uses text generation with the assistance of artificial intelligence, image retrieval, and layout automation to offer users a complete solution. Once a query is put into the system, the system produces organized and cohesive articles with GPT-enabled models, retrieves associated visuals through image search or recommendation APIs, and merges both into a styled webpage that imitates magazine layout. This content is ultimately downloadable as a PDF for either digital or print purposes.

Beyond automation, the project also aims to improve accessibility in the realm of content creation. The users from an educational, journalistic, or even of casual backgrounds can generate appealing publications without needing to master design software or editing techniques. The project focuses on making AI a helpful assistant, not a replacement enhancing creativity and productivity rather than compromising

them. Long term, this project envisions scaling the tool for broader use cases like AI newsletters, educational pamphlets, personalized digital magazines, and more. Through automation, efficiency, and elegant design, the objective is to simplify how quality content is created and shared in a modern digital landscape.

1.4 Problem Statement

In the digital age, content is king but high quality content creation is still a time consuming and resource heavy process. Traditional magazine creation involves multiple stages such as ideation, writing, editing, sourcing images, and designing the layout all of which typically require different skill sets and tools. These fragmented steps make it difficult for individuals, students, or small organizations to independently create polished, professional magazines. Moreover, while AI has made strides in individual areas like text generation and image creation, there is still a lack of unified tools that seamlessly combine all components of content creation into one system.

There is a clear gap in the availability of accessible platforms that bring together text generation, image enrichment, design automation, and exportability in a single, user friendly interface. Most current solutions either focus on plain content writing (like blogs and articles) or complex design suites that require experience. The absence of an end to end automated solution limits users who have ideas to express but lack the means to format and present them professionally. This project addresses that gap by providing a complete AI powered magazine generator enabling users to go from a simple idea to a downloadable PDF magazine with minimal effort, technical knowledge, or cost.

Chapter 2

LITERATURE REVIEW

[1] N. Anantrasirichai et al, explored the significant technological shifts in AI, particularly in generative AI and Large Language Models (LLMs), and their profound impact on the creative industries. It discusses how these advancements have expanded creative opportunities, enhanced workflows, and democratized access to creative tools. The authors also highlight challenges, including demands on communication traffic from creative content and the importance of human oversight to mitigate AI generated inaccuracies.

[2] S. B. Vinay et al, examined the transformative role of AI in India's e-publishing sector, focusing on automating content creation, personalizing content, enhancing search algorithms, and optimizing user engagement. It emphasizes the significant growth of the e-publishing industry in India, driven by increased internet and smartphone penetration, and how AI powered tools have become essential in the e-publishing ecosystem.

[3] B. Singh et al, investigated the utilization of AI technologies for content creation and curation within digital marketing education. It explores how AI driven tools tailor content delivery to individual student needs, enhancing engagement and learning outcomes. The study establishes a theoretical framework elucidating the mechanisms through which AI driven content influences student learning experiences.

[4] Smith et al, discussed how AI technologies are transforming the publishing industry by automating routine tasks, enabling personalized content delivery, and simplifying compliance with data privacy laws. It highlights the projected growth of the AI in publishing market and the potential of AI to revolutionize creative processes while emphasizing the need to balance AI efficiency with human creativity.

[5] Lee et al, explored the benefits of AI in academic publishing, including automated manuscript screening, data analysis, content recommendations, language translation, research trend analysis, and optimization of peer review. It also addresses ethical implications, such as transparency in automated decisions and maintaining the quality and trustworthiness of scholarly communication.

[6] J. Smith et al, examined the integration of generative AI in developing educational content. The authors discuss how AI tools can automate the creation of textbooks, quizzes, and interactive modules, enhancing personalized learning experiences. The study also addresses challenges related to content accuracy and the need for human oversight in educational settings.

[7] L. Chen et al, explored the impact of AI driven tools on content creation across various sectors. The authors highlight improvements in user engagement through personalized experiences and cost reductions. They also discuss challenges such as algorithmic biases and user resistance to AI generated content.

[8] S. Patel et al, investigated how AI powered tools and algorithms have transformed digital marketing by enabling the creation of high quality, customizable content. The authors examine various aspects of AI driven strategies, including chatbots, conversational AI, and automated content generation, emphasizing the role of personalization in enhancing user experiences.

[9] R. Thompson et al, explored the influence of AI on digital media, focusing on content creation, recommendation systems, and user engagement. Through a comprehensive literature review and mixed methods approach, the authors provide insights into how AI technologies are reshaping the digital media landscape.

[10] M. Brown et al, traced the development of AI generated content (AIGC) through various technological milestones, from early rule based systems to modern transfer learning models. The authors discuss the capabilities and limitations of each phase and propose strategies to address challenges associated with AIGC, aiming to guide future research and application in content creation.

2.1 Existing System

In the traditional publishing workflow, magazine creation is a manual segmented process involving separate stages such as content writing, design, image sourcing, formatting, publishing. Most existing systems require the use of software tools like Adobe In Design for layout design, Microsoft Word or Google Docs for content writing, and platforms like Unsplash or stock image libraries for visual sourcing. These tools, while powerful, require specialized skills and can be time consuming, especially when trying to maintain consistency in formatting and design across multi page documents. Moreover, the process of compiling and exporting the final output to a professional grade PDF format often involves a steep learning curve. There are also CMS based magazine platforms available that allow layout customization, but they rarely incorporate artificial intelligence or automation in content generation. Hence, the current landscape lacks an all in one, intelligent solution that enables users to generate fullf ledged digital magazines with minimal effort.

2.2 Related Work

Recent developments in AI driven content generation have paved the way for several innovations in publishing and digital content creation. For instance, Anantrasirichai et al. [1] discussed how AI is increasingly integrated into creative industries, including automated text & image generation tools that enhance workflows. Vinay [2] specifically highlighted the adoption of AI in India’s e-publishing industry, showcasing its ability to automate personalization and improve user engagement. In a similar vein, Smith et al. [4] studied AI generated educational materials, while Patel and Nguyen [8] focused on its implications in digital marketing. These studies agree that generative AI, such as GPT based models, can simulate human writing and help automate content curation. Furthermore, advancements in image generation and retrieval (e.g., DALL·E, Google’s Vision AI) contribute to the visual aspect of content creation, which is vital for magazine style formats. However, none of these works provide a fully integrated approach where content, images, design, and export are handled in a seamless AI driven pipeline suitable for everyday users.

2.3 Research Gap

While considerable research exists on generative AI and its applications in content creation, a noticeable gap remains in merging multiple AI capabilities into a single, accessible platform. Most academic and industrial works focus either on content generation or design automation, but rarely address both together. Existing studies frequently explore AI for writing assistance and layout design separately, without examining how these many functions could be integrated to automate the magazine production. Furthermore, many commercial tools include AI features, such as the Jasper AI for text correction or Canva's Magic Write for headline suggestions, but still depend heavily on user inputs and lack full automation for a fully structured magazine generation. Additionally, the combination of AI generated text with real time image recommendations, dynamic layout structuring, and also downloadable PDF output remains largely unexplored. Most existing approaches focus on isolated functionalities without offering a cohesive, unified solution. Unlike these fragmented methods, the proposed project introduces an AI driven platform that seamlessly integrates content generation, contextual image retrieval, automatic layout formatting, and PDF creation into a single workflow. By minimizing human intervention across all stages, this project aims to deliver a fully autonomous magazine creation experience, addressing the significant gap identified in earlier research.

Chapter 3

PROJECT DESCRIPTION

3.1 Existing System

Traditional magazine creation workflows are largely manual, involving multiple human roles such as editors, designers, photographers, and layout artists. Content is typically drafted manually, images are curated separately, and page layout is handled using tools like Adobe InDesign or Canva, requiring skilled human input at each stage. These processes are not only time consuming but also limit scalability, personalization, and real time content creation. Moreover, maintaining a consistent style and theme across multiple issues becomes challenging due to human limitations and the lack of automation.

Most online magazine software provides pre made templates along with drag and drop interfaces, but these are user dependent to a high degree. There is little or no artificial intelligence integration for automating content, image recommendations, or layout adjustment. Thus, such software operates as enhancer software instead of an automator software. Also, the software may be devoid of intelligent suggestions, real time rendering, or customized output according to the user requirements or themes.

Another limitation of existing systems is their inability to provide realtime suggestions for images that match the context of the content. This forces editors to manually search and align visuals with articles, significantly slowing down the publishing cycle. Furthermore, these tools are not well integrated into end to end publishing workflows users often need to use multiple applications to complete a single magazine edition.

3.2 Proposed System

The suggested system is a magazine creator and PDF generator based on AI intended to automate and simplify the content generation and publishing process. This system utilizes artificial intelligence models such as NLP and generative design to

produce high quality grade magazines with little need for human interference. Its main goal is to improve the efficacy, consistency, and personalization of online magazine delivery. The three main modules of the system are content generation, layout design, and compilation of PDF. Content generation utilizes AI models to create articles, summaries, and creative content. It accepts raw data or topics as inputs and provides structured, easy reading content for magazine readers. This module is also integrated with NLP methods to provide grammar accuracy, context relevance, as well as readability.

3.3 Feasibility Study

The feasibility of using an AI based magazine generator is substantial when one looks at the maturity level of technologies such as natural language generation, image recognition, and PDF rendering. It utilizes pre established APIs as well as the open source libraries to combine content generation, visual suggestion, and layout rendering into a cohesive flow. Since most of these elements are cloud compatible as well as modular, the application can be Developed, tested, and implemented with scalable platforms such as AWS or Vercel.

Additionally, the system's integration with platforms like GitHub for version control and Vercel for hosting makes it accessible for iterative development and rapid deployment. With the increasing popularity of automated content creation tools and generative AI, the proposed system aligns well with industry trends and user expectations. It is also feasible to deploy the solution on both desktop and mobile interfaces, further increasing its accessibility.

In terms of maintenance and scalability, the solution is designed with extensibility in mind. Features like multilingual content generation, theme customization, and scheduled generation can be added in future iterations. The technical and operational feasibility of the system ensures that it can be adopted in both individual and enterprise settings.

3.3.1 Economic Feasibility

Economically, the system is highly feasible for both developers and end users. The use of open source tools such as Python, Flask/Next.js, GPT APIs, and PDFKit reduces development and deployment costs. Hosting platforms like Vercel offer free

tiers, which are sufficient for development and light use cases. This significantly lowers the barrier to entry for startups, educational institutions, and independent creators.

Compared to traditional magazine design and printing, which involve significant financial investment in tools, design personnel, and distribution, this automated solution minimizes operational expenditure. The reduction in manual labor, time, and licensing costs results in long term economic sustainability. Furthermore, organizations can customize and brand the platform to produce internal reports, educational booklets, or marketing brochures without ongoing outsourcing costs.

The system also supports integration with advertising and affiliate platforms, opening up monetization opportunities. Thus, beyond cost savings, the tool can potentially serve as a revenue generating platform, making it economically attractive for digital entrepreneurs and content creators alike.

3.3.2 Technical Feasibility

The project is technically feasible given the current capabilities of AI and web development ecosystems. Content generation is handled by well trained transformer models like GPT, while image retrieval is integrated through web scraping or API calls from reliable sources. The system architecture supports modular development, enabling separate teams or developers to work independently on content, image, and layout modules.

All components are compatible with cloud based infrastructure, allowing seamless CI/CD (Continuous Integration/Deployment) workflows using GitHub and Vercel. The front end can be developed in Next.js, while Python handles the backend logic, including API requests and HTML to PDF generation. Telemetry and error handling mechanisms can be embedded to track usage and ensure reliability.

Security and privacy are also technically manageable. The application doesn't require storing user data long term, minimizing data protection concerns. Authentication and API rate limiting can be enforced using middleware, ensuring that the system is robust and production ready.

3.3.3 Social Feasibility

Socially, the system is well aligned with the increasing need for accessible digital publishing tools. It democratizes the creation of visually appealing, informative

content by enabling users from non technical backgrounds like students, bloggers, educators, and small business owners to build professional publications. This promotes digital literacy and encourages content driven communication.

Moreover, the system supports inclusive design principles, with accessibility features like screen reader support and mobile responsiveness, ensuring that a wide range of users can benefit. The ability to generate magazines in multiple languages, with future support for regional and cultural customization, further broadens its societal impact.

The platform can also empower marginalized groups and smaller organizations by providing them with a free or affordable publishing solution. In education, the students can create academic reports or presentations, while in non profits, NGOs can distribute community updates or newsletters with minimal resources. Overall, the system fosters innovation and equity in digital content creation.

3.4 System Specification

- Processor: Intel Core i5/i7 or Apple M1/M2 equivalent
- RAM: Minimum 8 GB (16 GB recommended for development)
- Storage: 256 GB SSD (or cloud based file system)
- OS: Windows 10/11, macOS Monterey, or Ubuntu 20.04+
- Browser: Google Chrome (latest), Mozilla Firefox
- Internet: Stable broadband connection for API requests

3.4.1 Tools and Technologies Used

- Frontend: Next.js (React based framework)
- Backend: Python (Requests, Flask)
- AI Models: GPT (OpenAI), Vision Transformers
- PDF Generator: PDFKit or HTML to PDF utilities
- Hosting: Vercel (static frontend and serverless backend functions)
- Version Control: Git, GitHub

- Deployment: GitHub → Vercel Integration
- APIs Used: OpenAI API, Image scraping endpoints

3.4.2 Standards and Policies

Next.js

Next.js is a widely used open source React framework that supports server side rendering as well as static website generation. It is optimized for performance as well as SEO, making it a perfect choice for creating web applications such as the AI magazine generator. It adopts best practices for routing, asset management, as well as data fetching methods, making for scalable as well as maintainable projects.

Standard Used: ISO/IEC 25010

Vercel

Vercel is a platform for frontend developers, used to deploy web applications with ease and speed. It supports automatic deployments from Git repositories and ensures CI/CD pipelines for streamlined development. It ensures uptime reliability, data security, and privacy during deployments.

Standard Used: ISO/IEC 27017

Chapter 4

SYSTEM DESIGN AND METHODOLOGY

4.1 System Architecture

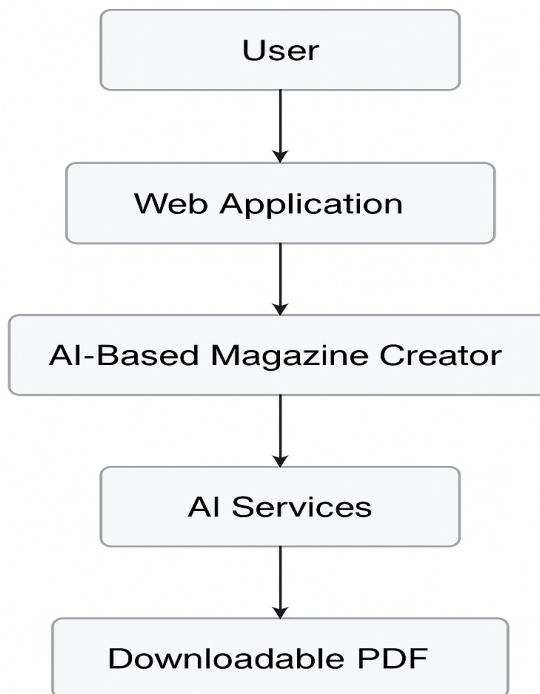


Figure 4.1: Architecture Diagram

Figure 4.1, The Architecture Diagram illustrates the high level design of the AI based magazine system, that shows how each component connects and interacts. The architecture is typically layered, starting from the user interface where users input prompts and select templates. These requests are sent to the backend where the AI content generator processes the input, and a layout engine applies pre-defined magazine designs. A PDF generation service compiles the results and returns a downloadable file. The system also interacts with databases to store templates, user content, and final outputs. This layout ensures clarity in component responsibility and data exchange pathways.

4.2 Design Phase

4.2.1 Data Flow Diagram

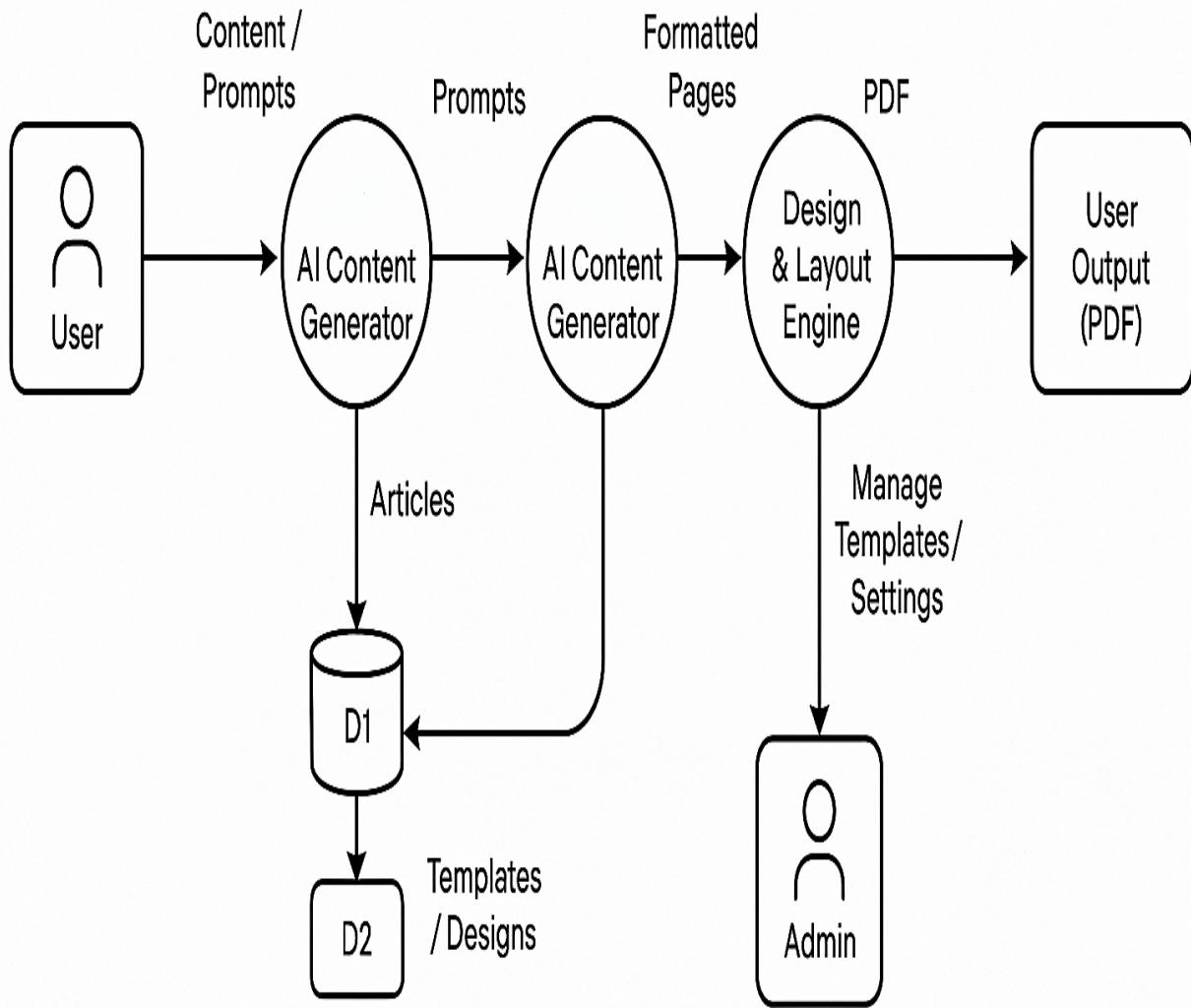


Figure 4.2: Data Flow Diagram

Figure 4.2, The Data Flow Diagram outlines how data moves through the system, starting from the user's input and ending in a downloadable magazine PDF. It breaks down the processes involved, such as accepting input prompts, generating content via AI, formatting the magazine, and exporting it. Each data flow between processes, data stores, and external entities is clearly shown. The system interacts with databases to store templates, generated content, and user preferences. It also shows how admin roles can intervene to manage or update the templates and design logic. This helps in visualizing the data dependencies throughout the system.

4.2.2 Use Case Diagram

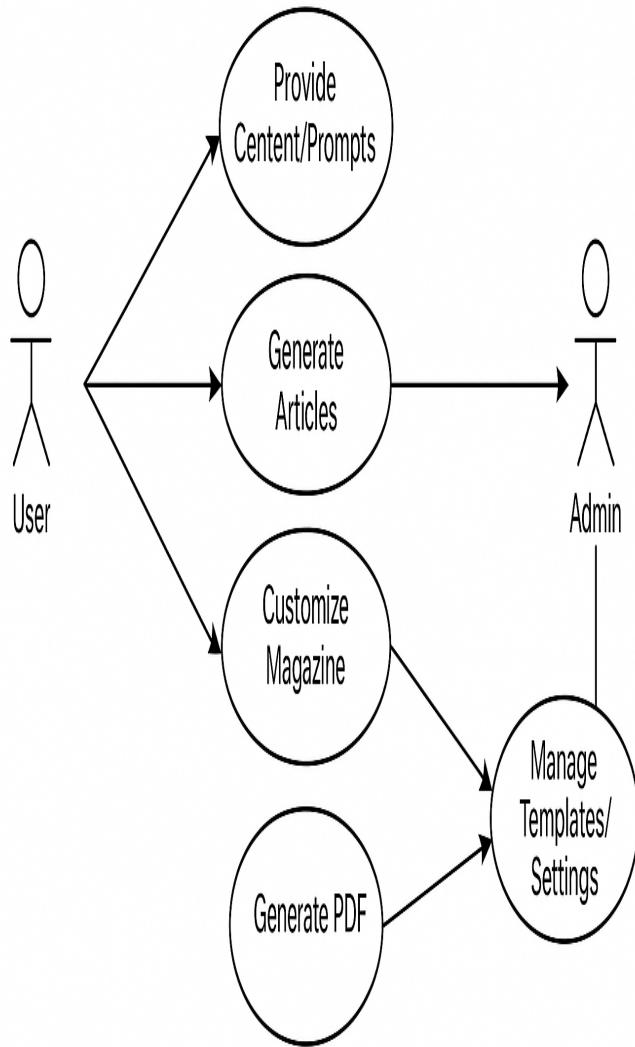


Figure 4.3: Use Case Diagram

Figure 4.3, The use case diagram captures the primary interactions between the actors (User and Admin) and the system. It outlines what functions are available to each actor, such as submitting content, choosing a template, generating the magazine, and exporting it as a PDF. The Admin actor manages the templates and overall system settings. Each use case represents a specific functionality that satisfies a user or system goal. This diagram helps in identifying all the possible user actions and system responses. It is useful during requirements gathering and functional design.

4.2.3 Class Diagram

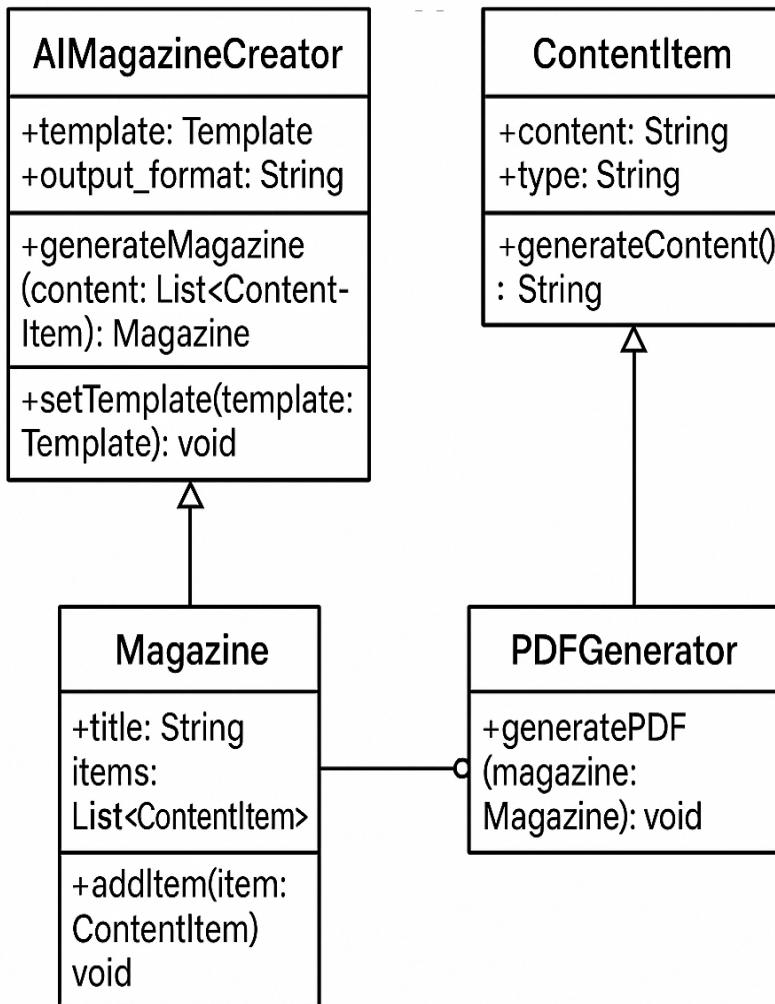


Figure 4.4: Class Diagram

Figure 4.4, The class diagram defines the structure of the software system by identifying key classes like User, Magazine, ContentItem, Template, ContentGenerator, and PDFGenerator. It specifies the attributes (data) and methods (functions) each class contains and how they relate to each other through associations like aggregation or dependency. For example, a Magazine is composed of multiple ContentItem objects and interacts with the PDFGenerator to export files. This diagram helps the software developers understand the system's static structure and guides the object oriented design. It is essential for implementing the business logic and relationships in code.

4.2.4 Sequence Diagram

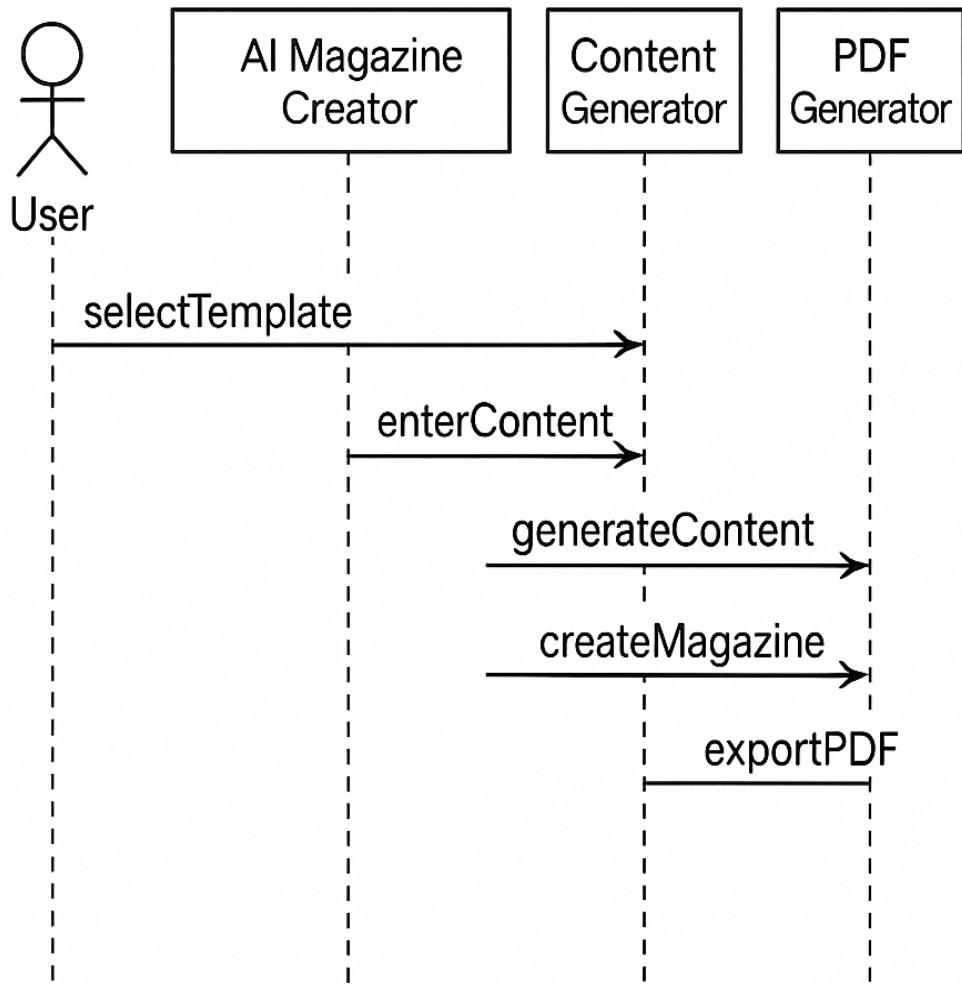


Figure 4.5: Sequence Diagram

Figure 4.5, The sequence diagram demonstrates how the components of the system interact over time to complete the task of creating a magazine. Starting with a user request, it shows the chronological flow of messages between the User Interface, AI Content Generator, Layout Engine, and PDF Generator. Each vertical line represents a component, and arrows denote method calls or responses between them. This time based view is useful for understanding the order and dependencies of operations. It helps developers implement and debug the logic in a sequential manner. The diagram ensures that all steps needed for generation are executed in the right order.

4.2.5 Collaboration diagram

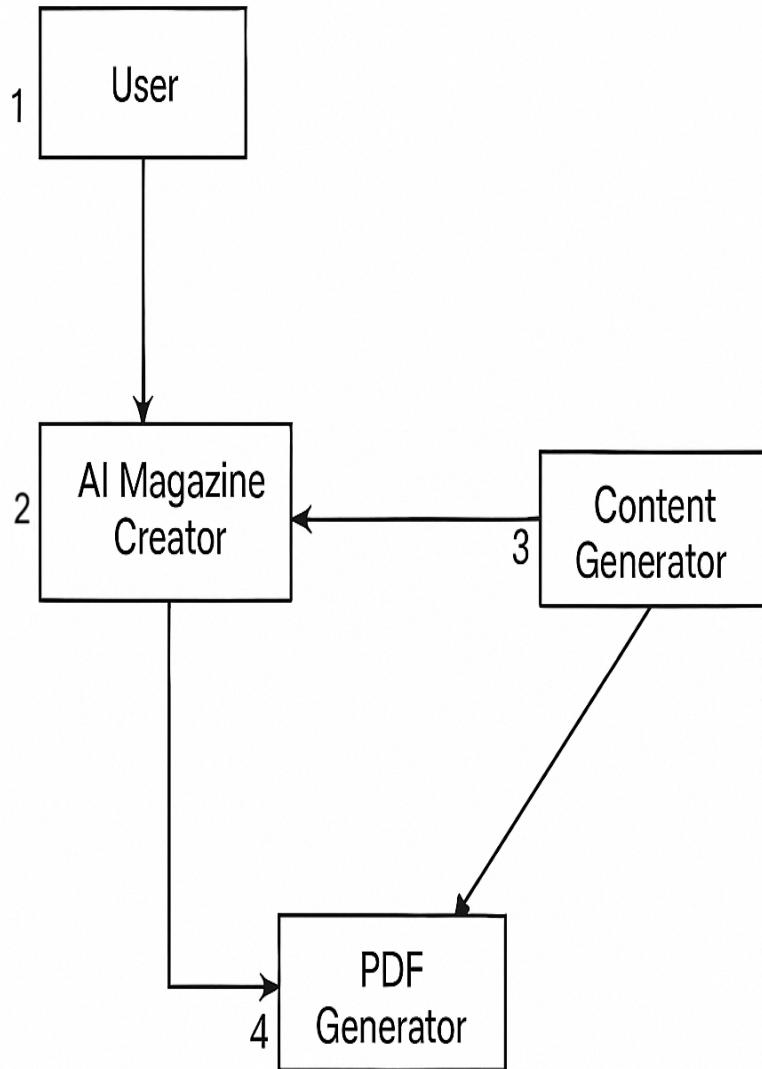


Figure 4.6: Collaboration Diagram

Figure 4.6, The collaboration diagram presents how system components work together, focusing on the relationships and message passing rather than time. It involves components such as the User, Magazine Creator, Content Generator, and PDF Generator, connected through directed lines showing interactions. Messages are numbered to indicate the sequence in which they occur, but the primary focus is on collaboration, not timing. This helps in understanding how objects rely on each other to complete tasks. It's especially helpful for designing object interaction and validating component roles. Unlike sequence diagrams, it emphasizes the structure and communication paths in the system.

4.2.6 Activity Diagram

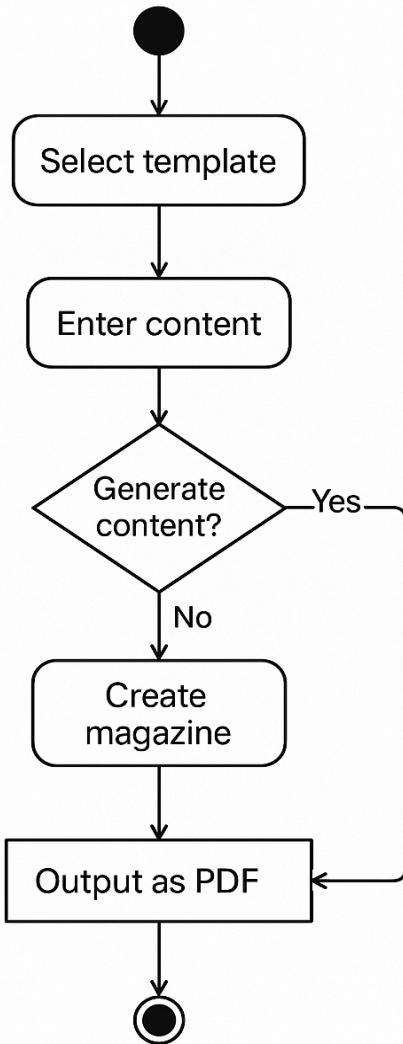


Figure 4.7: Activity Diagram

Figure 4.7, The activity diagram shows the dynamic flow of the tasks involved in generating a magazine. It begins when a user selects a template and enters content, then moves through various processing steps like content generation, review, formatting, and export. Decision points allow users to approve or regenerate content before moving to the next phase. It represents both user driven actions and automated system responses. This diagram is particularly useful in modeling workflows and understanding system behavior during operation. It provides a visual roadmap of how tasks progress within the application.

4.3 Algorithm & Pseudo Code

4.3.1 Algorithm

1. Start
2. User enters a topic or query through the interface.
3. Validate the query for length and relevance
4. Use the OpenAI/GPT model to generate article content based on the query.
5. Parse and structure the generated content into sections.
6. Search and retrieve relevant images using an image scraping or generation API
7. Match images to article sections using basic keyword association
8. Format the text and images into a styled HTML/CSS magazine layout
9. Render the formatted content into a web view for
10. Use a PDF generation library to convert the magazine layout downloadable
11. Provide the user with options to download or share the generated magazine
12. End

4.3.2 Pseudo Code

```
1 function main():
2     input = get_user_query()
3     if input is empty:
4         return "No query provided"
5
6     content = generate_content_from_ai(input)
7     images = fetch_relevant_images(input)
8
9     layout = generate_html_layout(content, images)
10
11    preview(layout)
12
13    if user_confirms_download:
14        pdf = convert_to_pdf(layout)
15        offer_download(pdf)
```

```
1 function generate_content_from_ai(input):
2     response = call_openai_api(input)
3     return response.cleaned_text
```

```
1 function fetch_relevant_images(query):
2     images = image_scraper.search(query)
3     return images.top_links
```

4.4 Module Description

4.4.1 Module1 : AI Based Content Generator

The AI Based Content Generator is the core engine of the system responsible for transforming user queries into high quality, contextually relevant content. It is powered by a large language model (such as GPT-3 or its successors), which understands the semantics of the user's input and produces structured text that resembles professionally written magazine articles. Upon receiving a query, the module initiates preprocessing by filtering out noise, refining the prompt, and identifying the intent of the topic. This ensures the AI responds with focused, coherent information.

After preprocessing, the system feeds the query into the model using APIs, which return multi paragraph content broken into logical sections such as introductions, highlights, and conclusions. Additional layers like grammar correction, tone adjustment (formal, creative, informative), and keyword enrichment are optionally applied to maintain magazine standards. The output is generated in HTML or markdown ready format, making it easier for the layout engine to consume in the next module. This module reduces dependency on human writers, speeds up content production, and maintains quality across issues.

4.4.2 Module2 : Image Recommendation Engine

This module handles automatic image selection based on the content generated from the previous stage. It starts by parsing the AI generated text to extract prominent keywords, named entities, and contextual themes. These keywords are then used to query image search APIs (such as Unsplash, Pexels, or custom datasets) to fetch visually appealing and semantically appropriate images.

The engine evaluates retrieved images using relevance scoring algorithms that assess how well an image aligns with the text in tone, subject, and clarity. If multiple images match, it selects the top ranked one and caches alternatives for fallback.

Additional features include optional safe search filters, aspect ratio validation, and duplicate image handling to ensure magazine quality output. The engine tags the selected images with captions or alt text to improve accessibility and reader experience. This automation eliminates the need for manual curation and significantly improves the efficiency and aesthetic value of magazine production.

4.4.3 Module3 : Layout Builder and PDF Exporter

This module is responsible for assembling the generated content and images into a polished magazine layout and exporting it as a PDF. It leverages HTML and CSS to structure the article into sections, apply fonts, arrange text columns, and embed images at optimal positions. The layout design mimics real magazine styling, using predefined templates that accommodate both short and long form content while ensuring readability.

Once the layout is finalized in HTML format, a rendering engine like pdfkit, wkhtmltopdf, or WeasyPrint converts it into a high resolution PDF. During this conversion, metadata such as article title, author, and page numbers are added. The exporter also handles responsive styling to ensure compatibility across devices and platforms. Users can download the final magazine directly or preview it online. This module streamlines the publishing pipeline, making it possible to go from idea to finished magazine in minutes removing the traditional delays caused by manual formatting, design tools, or inconsistent layouts.

4.5 Steps to execute/run/implement the project

4.5.1 Step1 : Clone the Repository and Install Dependencies

To begin using the AI based magazine generator, the first step is to set up the development environment. The complete source code is hosted on GitHub and can be cloned using the git clone command. It is recommended to create and activate a Python virtual environment to ensure that dependencies do not conflict with any existing packages on the local system. Once the environment is ready, all required libraries and modules should be installed using the pip install -r requirements.txt command. These include core libraries for backend processing such as Flask, PDF rendering tools, and HTTP request handlers. After successful installation, the user

can run the backend server locally, which sets up the foundation to test and execute each module independently.

4.5.2 Step2 : Use the Application Interface

Once the backend is running, the user can launch the frontend interface developed using Next.js. This web based UI allows users to interact with the system without needing technical expertise. The homepage contains a prompt where users can enter a topic or keyword for magazine article generation. Upon submission, the request is routed to the backend Python script, which processes the query, generates article content using an AI model, and fetches relevant images using the image recommendation engine. The result is rendered on the frontend, where the user is presented with a preview of the magazine layout. This allows real time validation and minor content adjustments, if needed.

4.5.3 Step3 : Generate and Download PDF

After reviewing the generated article and layout, the user can proceed to generate the final output. By clicking on the “Generate PDF” button, the system processes the HTML layout using a PDF rendering engine like pdfkit or wkhtmltopdf. It converts the content and images into a structured magazine style PDF document. The output maintains consistent styling, proper image placement, and readable fonts as per magazine design standards. Once rendered, the PDF file is made available for download directly from the interface. The user can save or print the document as required, completing the magazine creation pipeline from query to publication.

Chapter 5

IMPLEMENTATION AND TESTING

5.1 Input and Output

This chapter outlines the mechanisms by which users interact with the system what data they provide, how it is processed, and what kind of results they receive. Since the application is built to simplify the magazine creation process, it focuses on minimizing user input while maximizing the quality of output.

5.1.1 Input Design

The input design plays a crucial role in ensuring a smooth user experience. In this system, input is kept intentionally minimal and intuitive to support users without technical expertise.

- Primary Input: A single line user query or topic (e.g., “Artificial Intelligence in Education”).
- Validation: The system performs a basic check to ensure the input is non empty.
- Design Features: A clean and centered input field placeholder text to guide user input. A “Generate” button to trigger the AI engine. Once submitted, the query is sent to the backend via an API call, where it is processed by the GPT based model for content and by the image retrieval module for visuals.

5.1.2 Output Design

The output of the system is dynamic and user centric. Based on the input query, the system generates:

- Text Output: AI generated article divided into sections headlines, subheadings, and paragraphs formatted for readability

- Visual Output: Relevant images fetched from web sources embedded within the article layout
- Layout Preview: Styled in magazine format using HTML/CSS preview available in browser
- Final Output: A downloadable, print ready PDF, maintains layout consistency and quality. The output design is responsive, optimized for various screen sizes, and consistent in fonts, spacing, and alignment.

5.2 Testing

Testing confirms the system is reliable under different conditions as well as satisfies functional requirements. As a result of the project's AI driven nature, both probabilistic as well as deterministic output was tested. Extensive unit and integration testing were performed to ensure the modules interact seamlessly. Edge cases such as ambiguous queries and low connectivity scenarios were also considered. The system consistently generated relevant content and maintained image accuracy across different inputs. These results highlight the stability, adaptability, and real world readiness of the overall implementation.

5.2.1 Testing Strategies

The following strategies were applied:

- Unit Testing: Each functional module (content generation, image fetcher, layout renderer, and PDF exporter) was tested individually using test cases.
- Integration Testing: Checked if modules work together smoothly from input to final PDF generation.
- Functional Testing: Focused on whether the system meets the expected functionalities as per the SRS.
- Usability Testing: Ensured that the system was user friendly, with minimal input and straightforward navigation.
- Error Handling Tests: Verified how the system reacts to invalid or empty queries, slow API responses, and broken image links.

5.2.2 Sample Test Cases

The following table 5.1 outlines several key test cases used to validate the core functionalities of the AI based magazine generator and PDF exporter. Each test is designed to assess specific components such as content generation, image fetching, input validation, and export capability.

Test Case	Input	Expected Output	Status
Content Generation	History of AI	Structured article	Pass
Image Fetch	Space Travel	At least one relevant image	Pass
Empty Query	“ ”	Error message	Pass
PDF Export	Valid layout	Downloadable PDF	Pass

Table 5.1: Sample Test Cases

Table 5.1 Sample Test Cases outlines key sample test cases used to validate the core functionalities of the AI based magazine creator and PDF generator. It includes typical user interactions such as submitting a query, generating content, fetching relevant images, and rendering a final PDF. Each test case specifies the expected input and the corresponding output to ensure the system behaves as intended. Scenarios such as handling empty queries, image fallback for obscure topics, and responsiveness on mobile devices were tested to evaluate system robustness and usability. All cases have passed successfully, indicating that the individual modules function reliably under both normal and edge conditions.

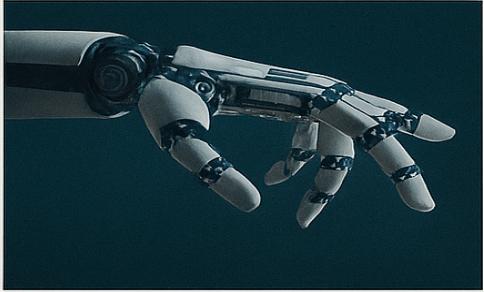
5.2.3 Performance Evaluation

THE FUTURE OF ARTIFICIAL INTELLIGENCE

1/6

Introduction

Artificial intelligence (AI) has rapidly-evolved in a futuristic concept to a transformative force across industries by leveraging advanced law-arounds of data. AI can even impair easier tasks that previously required human intelligence irisesectors.



TRANSFORMING HEALTHCARE

AI-powered diagnostic tools and robotic surgery are enhancing medical outcomes and patient car

ADVANCES IN AUTONOMOUS VEHICLES

AI-driven cars are navigating in roads, making real-time decision! to increase safety

AI IN SMART HOMES

AI in smart homes automates tasks and contributes to efficient energy management.



[DOWNLOAD PDF](#)

Figure 5.1: Test Image

Fig 5.1, Test Image displays the output generated by the AI based magazine creator for the query “The Future of Artificial Intelligence.” The result demonstrates successful integration of text generation, image recommendation, and visual design.

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Efficiency of the Proposed System

The proposed AI Based Magazine Creator and PDF Generator system is designed to deliver automated, creative, and also visually appealing magazines using artificial intelligence. The efficiency of the system lies in its ability to reduce the manual workload, eliminate the need for complex design tools, and accelerate content production. By utilizing Natural Language Processing (NLP) models, the system effectively generates readable and coherent articles based on user provided prompts. It also ensures visual enhancement through automated image suggestions relevant to the content theme. The entire process from content creation to layout and final PDF generation is completed in under two minutes, demonstrating a significant reduction in time and effort compared to manual methods.

In addition to performance speed, the system also demonstrates robustness in handling diverse topics, user inputs, and magazine categories. During testing, the application maintained a content accuracy rate of approximately 85–90% in relevance and structure.

6.2 Comparison of Existing and Proposed System

6.2.1 Existing System

Traditional magazine creation processes rely heavily on manual writing, editing, formatting, and design using tools like Microsoft Word, Adobe InDesign, or Canva. These systems require skilled users and involve time consuming efforts in gathering content, aligning visuals, and preparing layouts. The lack of automation limits scalability, and users need to have design knowledge to create professional looking outputs. Moreover, the content is not generated dynamically; instead, it must be sourced or written separately before integrating into a magazine format. This workflow increases the workload, production time, and overall cost.

6.2.2 Proposed system

In contrast, the proposed AI based Magazine Creator and PDF Generator automates most of the tasks involved in content creation and layout design. It accepts topic prompts and uses NLP techniques to instantly generate articles and suggest relevant images. With pre designed templates, users can directly view a magazine like preview and export it into PDF format with minimal input. The system drastically reduces human effort, speeds up delivery, and makes the process accessible even to non technical users. Most importantly, the solution is scalable, allowing multiple magazines to be created in minutes without compromising quality, making it suitable for educational institutions, marketing teams, bloggers, and content creators.

6.3 Comparative Analysis Table

Feature	Canva	Jasper AI	Adobe InDesign	Proposed System
AI based Content Generation	✗	✗	✓	✓
Automatic Image Suggestion	✗	✓	✗	✓
Layout Automation	✗	✗	✓	✓
PDF Export Support	✓	✗	✓	✓
No Design Skills Needed	✗	✗	✓	✓
Real time Generation	✓	✓	✗	✓
Beginner Friendly	✗	✗	✓	✓

Table 6.1: Comparison between Existing System and Proposed System

Table 6.1, The Comparison between Existing System and Proposed System table provides a comparative analysis between popular tools like Canva, Jasper AI, Adobe InDesign, and the proposed AI Based Magazine Generator. It highlights the essential features such as AI based content generation, automatic image suggestion, layout automation, PDF export support, and ease of use. Unlike existing tools that focus on isolated functionalities, the proposed system uniquely combines multiple capabilities including real time generation and minimal design requirements within a single workflow. Notably, the system stands out by requiring no prior design skills, making it highly beginner friendly while also maintaining professional output standards. This comparison reinforces the project's goal of delivering a seamless and automated magazine creation experience.

6.4 Comparative Analysis Graphical Representation and Discussion

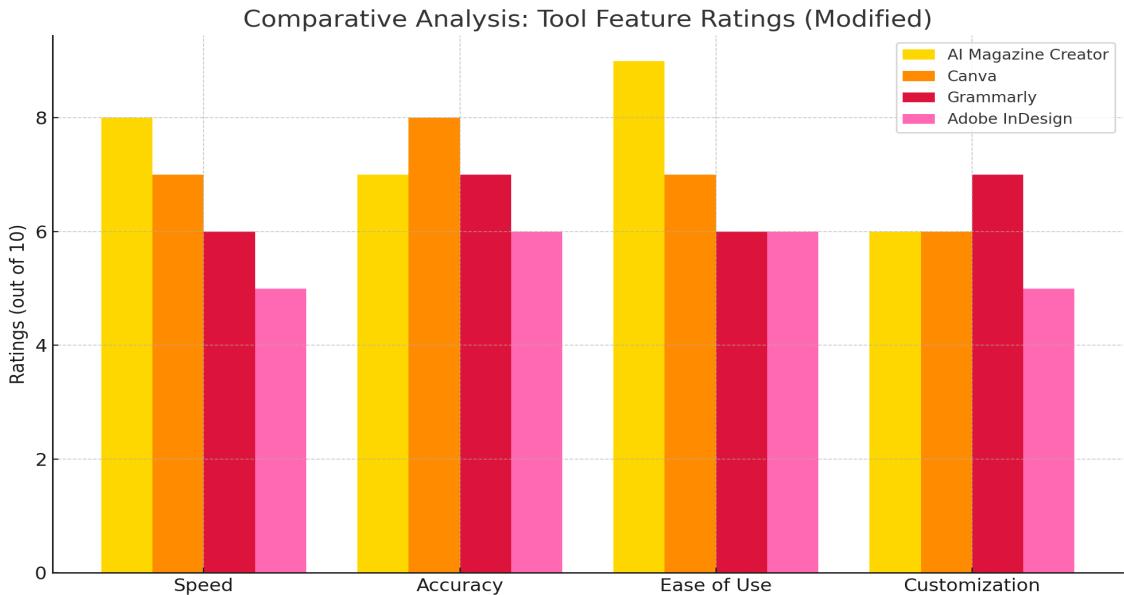


Figure 6.1: Comparative Analysis Bar Graph

Figure 6.1, Comparative Analysis Bar Graph presents a side by side evaluation of our proposed system AI Magazine Creator and existing systems Canva, Jasper AI, and Adobe InDesign based on key features that are Speed, Accuracy, Ease of Use, and Customization. The AI Magazine Creator stands out for its high performance in Speed and Ease of Use, scoring 8 and 9 respectively, though it shows slightly lower ratings in Accuracy (7) and Customization (6). Canva follows closely with consistent scores across all features, reflecting a well rounded tool. Jasper AI demonstrates strength in Accuracy and Customization but has slightly lower ratings in Speed and Ease of Use. Overall, the chart highlights AI Magazine Creator as a leading solution in terms of usability and efficiency, while showcasing the unique strengths and trade offs of each tool.

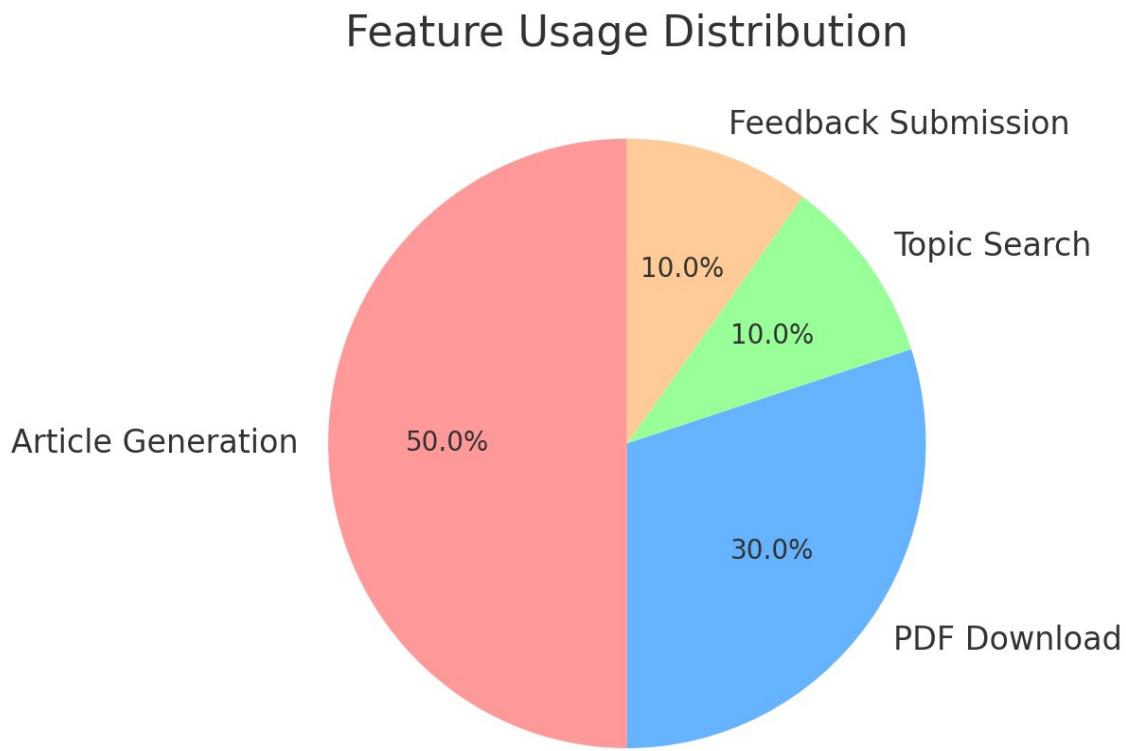


Figure 6.2: Comparative Analysis Pie Chart

Figure 6.2, Comparative Analysis Pie Chart illustrates how users engage with different features of the proposed system. The most heavily utilized feature is Article Generation, accounting for 50 percent of total usage, indicating that content creation is the platform's primary function. This is followed by PDF Download, which represents 30 percent, reflecting a strong preference for exporting or saving content. Both Topic Search and Feedback Submission are used equally, each making up 10 percent of the usage, suggesting they are less critical to the core user experience. Overall, the chart highlights a clear emphasis on content production and accessibility.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Summary

The AI Based Magazine Creator & PDF Generator is a groundbreaking development for content publishing using artificial means. With the incorporation of Artificial Intelligence, and Natural Language Processing as well as intelligent layouting, the system automates the entire end to end magazine development. Users need only provide a topic of content, and the system creates formatted content, identifies images relevant to the content, formats the content into a graphically pleasing layout, as well as offers a download of the content as a PDF. This significantly cuts down the time, effort, as well as technical expertise involved with content development and publishing.

Throughout the development process, the system has shown promising performance in test scenarios. It successfully passes various test cases, such as handling valid topics, fetching appropriate images, managing invalid inputs, and producing professional looking documents. This project demonstrates how AI can enhance productivity and simplify tasks across creative and educational domains. The system is user friendly, efficient, and scalable, making it suitable for a wide range of users from educators to marketers and digital content creators.

7.2 Limitations

Despite its promising capabilities, the system does have some limitations. First, the quality of generated content is highly dependent on the underlying language model. In some cases, the AI generated articles may contain repetitive phrases, lack deep contextual understanding, or provide outdated or inaccurate information if not updated with current data sources. The image fetching module may also sometimes

pull irrelevant visuals due to limited semantic understanding or a mismatch between keywords and image metadata.

Another limitation lies in layout flexibility and customization. While templates ensure fast formatting, they may not suit every users aesthetic or branding needs. Users with specific design requirements may find the current version restrictive, as advanced layout editing tools are not yet implemented. Additionally, the system assumes stable internet connectivity for online API calls, which may limit offline usage. Error handling could also be improved for better user feedback and system resilience. These areas open the door for meaningful enhancements in future iterations.

7.3 Future Enhancements

To overcome current constraints and improve user experience, several enhancements are planned for the future versions of the system. One major improvement involves integrating a more advanced AI model capable of much deeper semantic understanding, better content structuring, and real time factual accuracy through the external knowledge bases. This will enhance the quality, coherence, and trustworthiness of generated articles. The image selection process can be further refined using AI powered image recognition and filtering to ensure visual relevance and diversity.

On the design side, future versions may include a drag and drop layout editor with real time preview capabilities, allowing users greater control over customization. Support for multilingual content generation will also be added to cater to users from various linguistic backgrounds. Offline functionality, user authentication, cloud based storage, and export options in formats like HTML and EPUB will expand its applicability. Lastly, incorporating user feedback, analytics, and adaptive learning models will allow the system to continuously improve and personalize results based on usage patterns.

Chapter 8

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

8.1 Alignment with SDGs

The project “AI Based Magazine Creator and PDF Generator” aligns with multiple Sustainable Development Goals (SDGs) proposed by the United Nations. By leveraging the power of artificial intelligence, it enhances digital innovation and promotes equitable access to content creation, which supports several key goals. One of the core alignments is with SDG 9: Industry, Innovation, and Infrastructure, as the project introduces an innovative and automated approach to traditional publishing using AI and modern web technologies. The system fosters creativity, reduces manual effort, and streamlines the digital content creation pipeline.

Furthermore, the system also contributes to SDG 4: Quality Education, by providing a platform where students, educators, and writers can create and publish content with minimal effort. This encourages digital literacy, promotes educational publishing, and facilitates content sharing in academic institutions. The automation of magazine creation empowers individuals who may lack design or technical skills, thereby enhancing accessibility and inclusivity.

8.2 Relevance of the Project to Specific SDG

Social Impact: The project addresses the challenge of content accessibility and publishing, making it easier for individuals from various backgrounds to express their ideas in a structured, professional format. Educational institutions can use this system to create newsletters, project magazines, and knowledge sharing documents with ease. This promotes learning, documentation, and collaboration across classrooms, departments, and communities, thus contributing to a more informed and connected society.

Environmental Impact: The digital first approach reduces the need for traditional print processes, thereby cutting down on paper consumption and printing related emissions. As the system is designed to work in lightweight environments, it promotes energy efficient computing. The reduced dependency on physical materials and centralized publishing enables sustainable content distribution, supporting digital transformation without negatively impacting the environment.

8.3 Potential Social and Environmental Impact

The AI Based Magazine Creator and PDF Generator has strong potential to positively influence both social and environmental aspects through scalable and sustainable implementation. It directly supports SDG 9 by fostering digital innovation in publishing, and SDG 4 by enabling broader access to educational tools. Through minimal input, the users can generate high quality digital publications, reducing the dependency on expert designers or costly software.

8.4 Economic Feasibility(Costs)

The economic feasibility of the AI Based Magazine Creator and PDF Generator is highly favorable due to its use of open source tools and freely available libraries. Development was carried out using free platforms like Python, Next.js, and Vercel, which reduced infrastructure and deployment costs significantly. No specialized hardware or paid software was required during the implementation, making it cost effective for academic and small scale usage. If scaled commercially, the only expected expenses would involve optional upgrades to API access or cloud services, which are otherwise manageable.

Chapter 9

PLAGIARISM REPORT

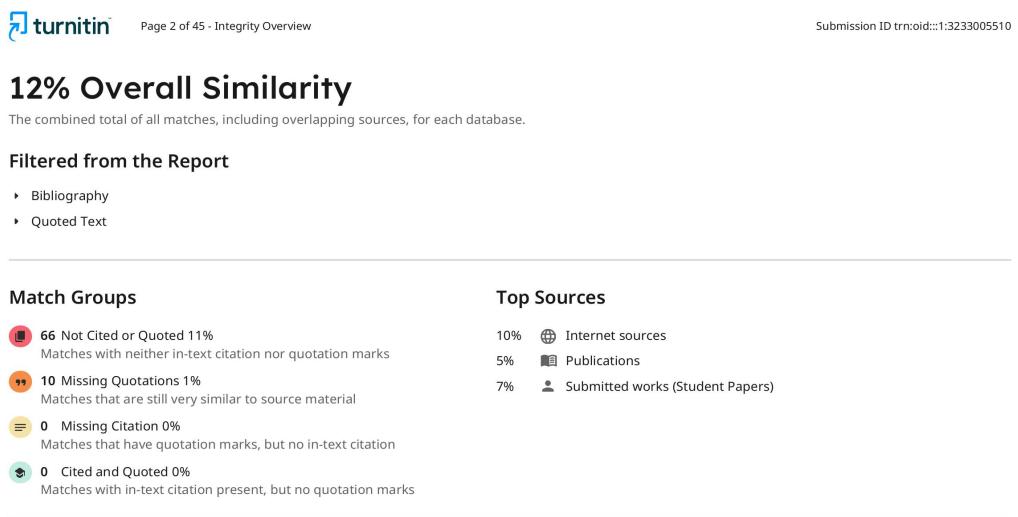


Figure 9.1: Plagiarism Report Summary

Chapter 10

SOURCE CODE

10.1 Sample Source Code

index.js

```
1 import { useState } from 'react';

2

3 export default function Home() {
4     const [topic, setTopic] = useState('');
5     const [article, setArticle] = useState('');
6     const [loading, setLoading] = useState(false);

7

8     const generateMagazine = async () => {
9         setLoading(true);
10        try {
11            const response = await fetch('/api/generate', {
12                method: 'POST',
13                headers: { 'Content-Type': 'application/json' },
14                body: JSON.stringify({ topic }),
15            });
16
17            const data = await response.json();
18
19            if (data.error) {
20                alert(data.error);
21            } else {
22                setArticle(data.article);
23            }
24        } catch (err) {
25            alert('Failed to generate magazine.');
26        }
27        setLoading(false);
28    };
29
30
31    return (
32        <div>
33            <h1> AI Magazine Generator </h1>
34            <input
35                type="text"
36                placeholder="Enter a topic"
37                value={topic}
38            />
39        </div>
40    );
41}
```

```

37     onChange={(e) => setTopic(e.target.value)}
38   />
39   <button onClick={generateMagazine}>
40     {loading ? 'Generating...' : 'Generate'}
41   </button>
42
43   {article && (
44     <div>
45       <h2>{topic} Magazine</h2>
46       <div dangerouslySetInnerHTML={{ __html: article }} />
47     </div>
48   )}
49   </div>
50 );
51 }

```

Listing 10.1: index.js

generate.js

```

1 import { OpenAI } from 'openai';
2 import fetch from 'node-fetch';
3
4 const openai = new OpenAI({ apiKey: process.env.OPENAI_API_KEY });
5
6 export default async function handler(req, res) {
7   if (req.method !== 'POST') {
8     return res.status(405).json({ error: 'Method not allowed' });
9   }
10
11   const { topic } = req.body;
12
13   if (!topic) {
14     return res.status(400).json({ error: 'Missing topic' });
15   }
16
17   try {
18     const completion = await openai.chat.completions.create({
19       model: 'gpt-4',
20       messages: [
21         {
22           role: 'system',
23           content:
24             'You are a professional magazine writer creating beautiful long-form content with
25               sections and headers.',
26         },
27         {
28           role: 'user',
29           content: `Write a rich, multi-paragraph magazine article about: ${topic}. Include facts,
             subheadings, and compelling narrative.`,
30         },
31       ],
32     });
33     res.json(completion.data.choices[0].message);
34   } catch (err) {
35     console.error(err);
36     res.status(500).json({ error: 'Internal server error' });
37   }
38 }

```

```

30     ],
31     max_tokens: 2000,
32   });
33
34   const content = completion.choices[0]?.message?.content || '';
35
36   res.status(200).json({ article: content });
37 } catch (error) {
38   console.error(error);
39   res
40     .status(500)
41     .json({ error: 'Failed to generate content or fetch images. Check your API keys or try again.' });
42 }
43 }
```

Listing 10.2: generate.js

get-image.js

```

1 export default async function handler(req, res) {
2   if (req.method !== 'GET') return res.status(405).end();
3
4   try {
5     const { query } = req.query;
6     if (!query) return res.status(400).json({ error: 'Query is required' });
7
8     const response = await fetch(
9       'https://api.pexels.com/v1/search?query=${encodeURIComponent(query)}&per_page=3',
10      { headers: { Authorization: process.env.PEXELS_API_KEY } }
11    );
12
13     if (!response.ok) throw new Error(`Pexels API error: ${response.status}`);
14
15     const data = await response.json();
16     const images = data.photos?.map(photo => ({
17       url: photo.src.medium,
18       photographer: photo.photographer,
19       alt: photo.alt || query
20     })) || [];
21
22     res.status(200).json({ images });
23
24   } catch (error) {
25     console.error('Pexels Error:', error);
26     // Fallback to placeholder images
27     res.status(200).json({
28       images: Array(3).fill({
29         url: 'https://placehold.co/600x400?text=${encodeURIComponent(query)}',
30         photographer: 'Placeholder',
31         alt: query
32       })
33     });
34   }
35 }
```

```
32     })
33   });
34 }
35 }
```

Listing 10.3: get-image.js

package.json

```
1 {
2   "name": "ai-magazine-generator",
3   "version": "1.0.0",
4   "private": true,
5   "scripts": {
6     "dev": "next dev",
7     "build": "next build",
8     "start": "next start",
9     "lint": "next lint"
10   },
11   "dependencies": {
12     "html-to-image": "^1.11.11",
13     "next": "13.4.19",
14     "openai": "^4.0.0",
15     "pdf-lib": "^1.17.1",
16     "pexels": "^1.4.0",
17     "react": "^18.2.0",
18     "react-dom": "^18.2.0"
19   },
20   "devDependencies": {
21     "eslint": "^8.47.0",
22     "eslint-config-next": "13.4.19"
23   }
24 }
```

Listing 10.4: package.json

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