

Designing an Artificial Intelligence Based Content Creation System with a *UML Approach*

Alviandini Widyaningrum, Yeni Setiani, Dewi Agushinta R.

Gunadarma University, Jakarta, Indonesia

Jl. Margonda Raya no. 100, Depok 16424, Jawa Barat

Email: alvianviadini@gmail.com, yeni_setiani@staff.gunadarma.ac.id, dewiar@staff.gunadarma.ac.id

Abstract— Improvement of production content using the technology of Artificial intelligence (AI) makes it possible to automate production content that can accelerate the creative and productive process content with more cost efficiency. Artificial intelligence technology can help content creators and marketers analyze data more effectively, provide deep insights into user preferences, and guide strategic decisions. Artificial intelligence can be used to improve content search and classification, making it easier for users to find relevant and interesting content. This research discusses the design of an artificial intelligence-based content creation system using the UML approach. The stage in designing this website is to use the prototyping method. Planning using Unified Modeling Language (UML) which consists of use cases, activity diagrams, and sequence diagrams. This system makes it easy for content creators to generate new content ideas, improve production consistency, and adapt to changing trends as well as providing practical implementation recommendations for content creators.

Keywords— Analysis, Artificial Intelligence, Design, Prototyping, UML.

I. INTRODUCTION

The content creation industry is an important part of the modern digital world. Individuals or groups create, develop, and distribute creative content through various *online platforms*. The role of the content creator industry is increasingly important in the context of digital marketing, as consumers are more connected to *online content* than ever before.

Increasing content production using artificial intelligence (AI) technology allows automation in content production which can speed up the creative process and produce content more efficiently. Artificial intelligence technology can help content creators and marketers analyze data more effectively, provide deep insights into user preferences, and guide strategic decisions. Artificial intelligence can be used to improve content search and classification, making it easier for users to find relevant and interesting content.

The presence of *Artificial Intelligence* has opened the door to new opportunities in the business world. By utilizing the advantages of artificial intelligence technology, entrepreneurs can implement and develop strategies that are not only effective but can also accelerate the achievement of business goals. The advantages of artificial intelligence involve its ability to analyze data in depth, identify market trends, and provide accurate recommendations.

Content creation by content creators has several challenges and difficulties, such as a lack of content ideas, content creators often face difficulties in continuing to create new and

interesting content ideas so that users do not feel bored with the content. Apart from that, maintaining consistency in content creation is very necessary so that content does not fade. Content creators also have to manage their time, especially if they have other jobs or responsibilities outside of their creative content. The importance of efficiency in the content creation process for *branding success*. Another challenge is changes in user tastes and trends which can change quickly. Content creators must continually monitor these changes and strive to stay relevant.

Based on this description, the author will design a content creation system based on artificial intelligence using the *UML approach*.

II. RESEARCH METHODS

Intelligence artificial or *Artificial Intelligence* is one of the branches of knowledge computers that learn and imitate methods taught by humans and implemented in machines (computers). John McCarthy (1956) argues that intelligence artificial or *Artificial Intelligence (AI)* is a business modeling the thought processes of people and designing a machine to get it to imitate the behavior of man.

The *prototype* method is used to design information systems. Method *Prototypes* provide opportunities for program developers and research objects to interact with each other during the system design process [1]. Meanwhile, according to [2], the *prototype* method is "a process that allows *developers to create a software model*, this method is good to use if *the client cannot provide maximum information regarding their desired needs*". Therefore, it can be concluded that the method of *Prototyping* is a software development model where program developers and research objects can communicate with each other and provide information consisting of listening to customers or analyzing needs, making designs (*mockups*), and testing designs.

Prototyping begins with gathering requirements, involving system developers and users to determine the goals, functions, and operational needs of the system [3]. The steps in prototyping are as follows: gathering requirements, fast design process, building a *prototype*, evaluating, and improving as in Figure 1.

The first stage describes gathering requirements to identify the goals of the system to be built and identifying the information requirements that will arise to achieve these goals. Next, the design or designing process is designing a system that will be built. Then build a *prototype*, namely forming a model of the software that must be created.

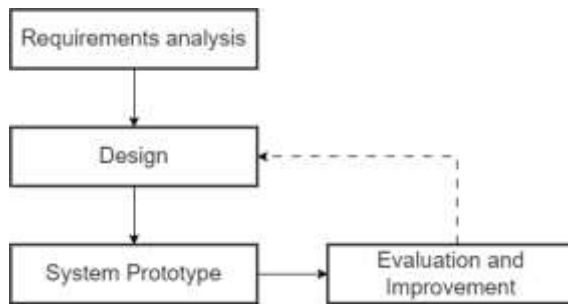


Figure 1. Steps to Building a Prototyping Method

The navigation structure is the menu arrangement or hierarchy of a site that describes the contents of each page and the links or navigation of each page on a website [4].

The navigation structure is the structure or output flow of the program. Determining a navigation structure is something that should be done before creating a homepage. 4 basic types of navigation structures can be used in the homepage creation process, namely linear, hierarchical, non-linear, and mixed.

The navigation structure is the structure or flow of a program which is a design of the relationships between several different areas and can help organize all elements of website creation [5].

Use Case is a step in describing the behavior of a system under various conditions when the system responds to a request from someone who has an interest in the development of the system itself [6].

According to Munawar (2005), activity diagrams are a technique for describing procedural logic, business processes, and workflows in many cases. Activity diagrams have a role like flowcharts, but the difference with flowcharts is that activity diagrams can support parallel behavior while flowcharts cannot [7].

As in [8], sequence diagrams represent detailed interactions between actors and systems or between collaborating objects in certain blocks of time.

Sequence diagrams are used to show interactions between objects in sequential order. The main purpose of a sequence diagram is to define a sequence of events that can produce the desired output [9].

In system design, several previous studies serve as references for this research:

Provides an overview of the use of the Prototyping model in information system development activities which can produce prototypes as one of the first steps in an information system development activity. The results of this research can be used as a reference or point of reference for information system developers who have followed the development steps in a structured manner, thereby providing process clarity for users and observers of information system development science [10].

Another research conducted [11] was entitled "Designing an E-Marketing System for Content Creator Products Using the SOSTAC Method". The research aims to build a web-based content creator e-marketing system. This system was tested using the black box method. The application of the content creator e-marketing system uses the SOSTAC method which can provide output from e-marketing designs that help facilitate

the search for content creators in Indonesia and help promote them on www.contentcreatorindonesia.com.

Further research was conducted [12] aimed at designing modeling using UML which allows each object to be seen clearly and easily understandable. This research models the workings or framework of C2C using UML (Unified Modeling Language) modeling.

In research conducted by [13] a website-based savings and loan application was created using a prototyping model which aims to make it easier for village officials to process village information data to be more effective and efficient in providing information about village government in Lau Gumba Village. This research uses the prototyping method with the first stage being requirements gathering, then the design process, and the last is building a prototype, and if there are evaluations and improvements you can return to the design process stage.

Research to design a library system to simplify and speed up work operations related to library activities, as well as make activities more effective and efficient compared to manual was conducted. The library system design uses the UML modeling language, namely use case diagrams, activity diagrams, class diagrams, and sequence diagrams [14].

Research conducted by Adinda Arly, Nanda Dwi, Rea Andini (2023) entitled "Implementation of the Use of Artificial Intelligence in the Learning Process of Communication Science Students in Class A" states that Artificial Intelligence (AI) has the aim of helping human work with a framework of thinking and reasoning such as humans based on human orders themselves, and one of the biggest advantages in using Artificial Intelligence (AI) is its ability to make decisions in an efficient manner that tends to be fast and accurate based on existing data [15].

III. RESULTS AND DISCUSSION

A. Requirements Collection

At the stage of collection determine the objective from the application will created, looking for material-related references with making planning as well as data collection via books, sources online references such as e-books, journals, and articles.

At the stage of the collection, there are analysis data requirements regarding information challenges as creator content and review influence technology intelligence artificial in industry creator content, analysis needs functional and non-functional explain about required information in fulfill hardware and software requirements for a build system.

1. Analysis Data Requirements

At stage analysis, Data requirements include:

- a) Can see *chat history*
- b) Determine *the role of the agent specialist (Chat Expert)*

The design of an artificial intelligence-based content creation system has a display that is easy for users to operate and is more attractive or *user-friendly*.

2. Functional Requirements Analysis

At this stage, functional data analysis is carried out such as:

- a) *Users choose an agent specialist for social media*
- b) *The user sends a message to the specialist agency*

- c) *Agent specialist* answers *user* questions
- 3. Non-Functional Requirements Analysis

Stage non-functional analysis includes:

- a) Hardware in the form of system Windows 10 Home Edition 64-bit operation
- b) Intel Core i-5+ 8th Gen Processor
- c) Memory of 8GB
- d) NVIDIA GEFORCE GTX 1050Ti Graphics Card
- e) Software in the form of Visual Studio Code, Laravel 8, MySQL

B. Design Process

At the design stage, a design process is carried out and improvements are made if there are design discrepancies. This phase explains what will be used in the design process.

1. Process Design

At the design stage, this process explains the system flow and data flow which are explained through diagrams *use cases*, *activity diagrams*, and *sequence diagrams*. The *use cases diagram* illustrates the design of the access page for the *user* and *specialist agent*, *activity* The diagram depicts interrelated activities between *users*, *admins*, and *specialist agents*, and *sequence diagrams* show a series of messages sent between several objects.

a. Use Case Diagrams

Use cases Diagram is a technique used in developing *software* or systems to capture the functional requirements of a system. *Use cases* explain the interactions that occur between actors from the interaction of the system itself and the existing system. The design of an artificial intelligence-based system to assist creators in designing content and *branding concepts* in the digital era using the *UML approach* is illustrated in Figure 2.

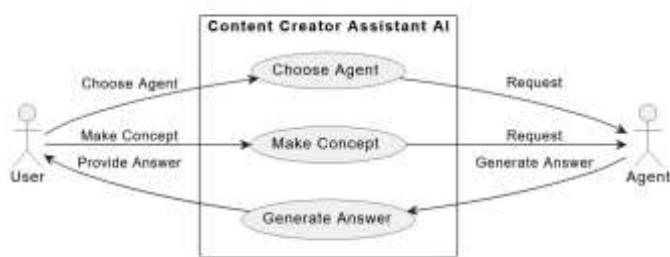


Figure 2. System Use Case Diagram

Figure 2 shows the *user* as an actor who can choose a *specialist agent* and make requests for concept ideas to *specialist agents*. Then *agent specialists* can produce and provide answers according to *user* requests.

b. Activity Diagrams

Activity A diagram is a workflow of a system or menu in the software. *Activity The diagram* can be seen in Figure 3.

Figure 3 explains the system workflow. *Admin* creates a *specialist agent* and then determines the *specialist agent's* role. After the role is created, the *user* can select the *agent specialist* role social media can then ask *specialist agents* or you can consult with a *specialist agent* to create the desired concept in

the *chat column* provided. After that *agent specialist* receives questions from *users* and generates information which then answers questions from *users* by replying to questions in the *chat column*. *Agent specialists* and *users* conduct question-and-answer conversations regarding problems faced by *users* and help provide ideas to *users*. The conversation is saved into the *database*. If the *user* wants to have a conversation or statement again, you can send the question to the *chat column* and the *agent specialist* will answer the *user* questions again.

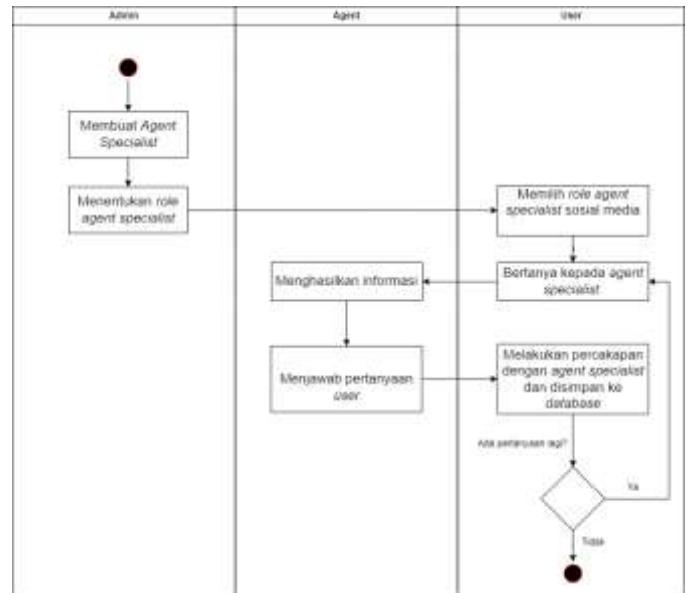


Figure 3. System Activity Diagram

c. Sequence diagrams

A *sequence diagram* is a diagram that explains the workflow carried out by the system. The *sequence diagram* can be seen in Figure 4.

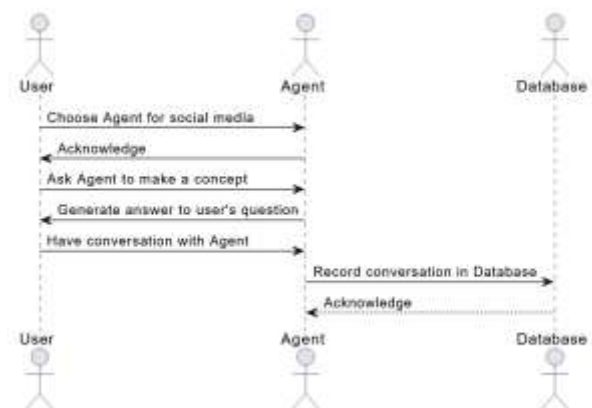


Figure 4. System Sequence Diagram

In Figure 4, the interactions carried out by *users* to manage activities. Describes the interaction between a *user* and several objects in a time sequence. Its use is to show the series of messages sent between objects as well as interactions between objects that occur at certain points in system execution. The *user* chooses a *specialist agent* on social media, and then the *agent specialist* knows the role chosen by the *user*, after that the

user can ask a *specialist agent* regarding problems experienced by users, or you can consult. Then *the specialist agent* produces and provides answers according to *the user's request*. Agent *specialist* and *users* You can carry out lessons which will be stored in *the database*, and the knowledge that has been taught will be stored in *the database*.

2. Navigation Structure

Navigation structure is used to describe the content and relationships of all pages. In designing this system, a mixed navigation structure is used.

a. User Navigation Structure

The navigation structure in this system design uses a mixed navigation structure. Users can see the system or application as a whole so that users get good information.

Users log in first to be able to enter the system. As a user, this system provides facilities such as registering, logging in to an account, selecting a specialist agent role (chat expert), and asking specialist agents regarding needs or problems that occur. The user navigation structure can be seen in Figure 5.

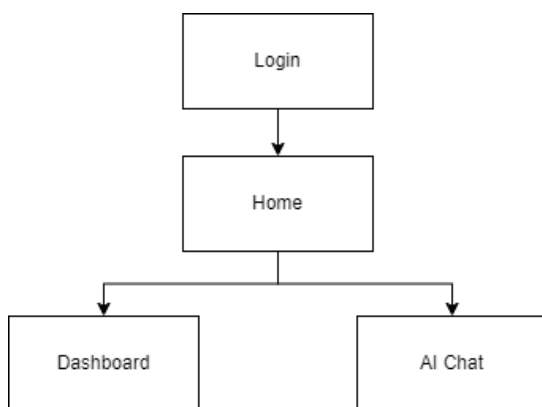


Figure 5. User Use Case Diagram

In Figure 5, each menu is side by side or related to each other. *The user* logs in first, and after that there is a *home menu* that includes *the Dashboard and AI Chat menus*. *AI chat* is a menu used by *users and specialist agents* to carry out question-and-answer conversations.

b. Admin Navigation Structure

Admin administrator is a user whose job is to manage the entire system, whether in the form of adding, updating, changing, or deleting data. The design of *the admin* navigation structure can be seen in Figure 6.

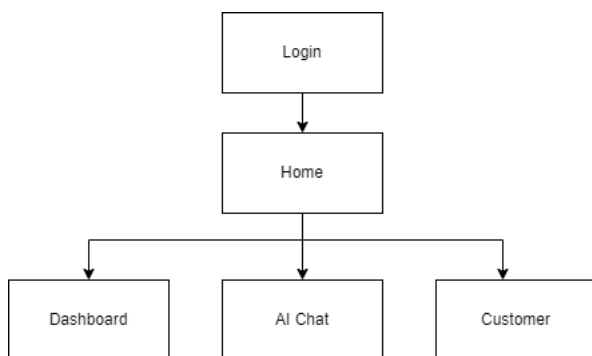


Figure 6. Admin Navigation Structure

Figure 6 is the *admin navigation structure*. Each menu is adjacent to or related to each other. *The admin* logs in first, and after that there is a *home menu*, in the *home menu* there are *Dashboard, AI Chat, and Customer* menus. In the *Dashboard menu*, there is information regarding the total words that have been generated or answered by *specialist agents*. Then the *AI Chat menu* is a menu for carrying out conversations between *specialist agents and users*. After that, there is a *customer menu* which is used by *the admin* to manage users.

C. Building Prototypes

Building a *prototype* is the stage of designing the interface between the user and the system. At this stage, there are several display designs based on the pages created to make it easier to design the information system.

The prototype results of designing the *login display* are in Figure 7.

1. Login Page Design

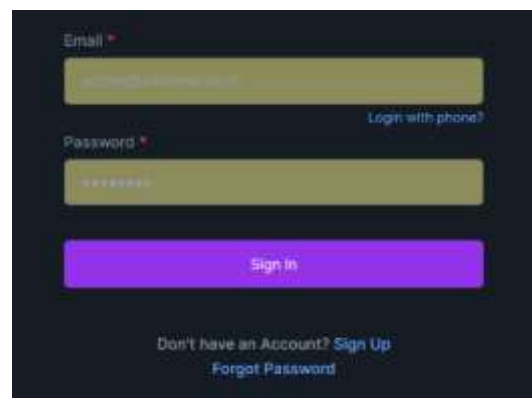


Figure 7. Login Page

Users must log in first by entering *their email and password*. If you don't have an account, you can register first by pressing the *sign-up button*.

2. Admin - User Page Design

the admin – user page can be seen in Figure 8.

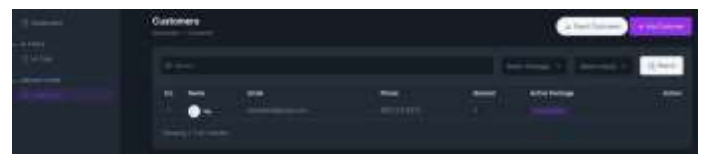


Figure 8. Admin – User page

Figure 8 shows the admin page in the *customer (user) menu*. Admins can manage *user data*, add users by clicking the *add customer button*, then download user data by clicking the *export customer button*, and view user information such as name, email, and telephone number.

3. Design – Add New Customer

The design of the admin page – *add new customers* can be seen in Figure 9.

Figure 9 shows the *Add new customer page* to add a *user account*. Admins can create *user accounts* by filling in information such as *username, email, telephone number, and password*.

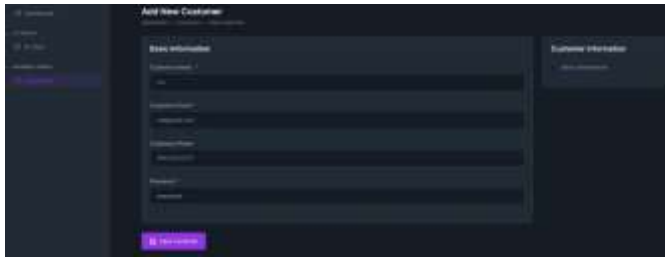


Figure 9. Admin page – add new customer

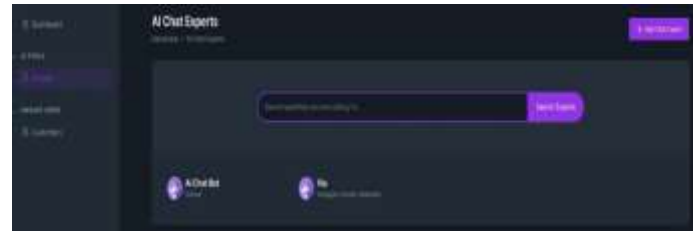


Figure 12. Admin Page – AI Chat

4. page design – customer updates
page design – customer updates can be seen in Figure 10.

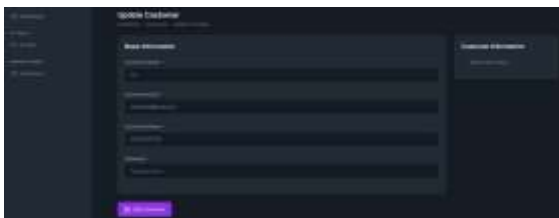


Figure 10. Admin Page – Customer Updates

Figure 10 shows the customer update page for changing user account data. Admins can change user accounts by updating information such as username, email, telephone number, and password.

5. Admin page design – expert update
The admin page design – expert updates can be seen in Figure 11.

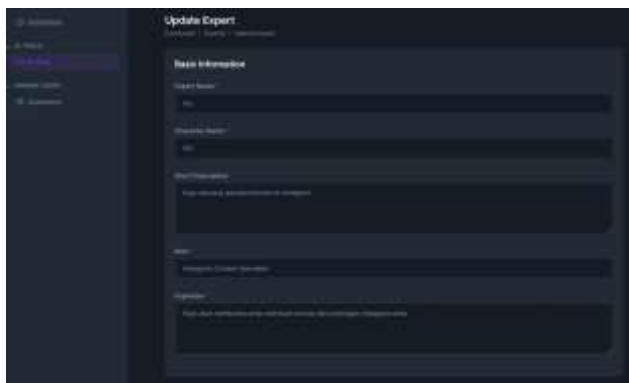


Figure 11. Admin page design page – expert update

Figure 11 shows the admin page in the update expert menu to change expert or specialist agent data. Admin can change specialist agent account by updating information such as expert name, character name, explanation or description, role, and expertise.

6. page design – AI Chat
The design of the admin page – AI Chat can be seen in Figure 12.

Figure 12 shows the admin page on the AI Chat menu. Admin can add specialist agents/chat experts by clicking the add chat expert button. In this menu the admin creates a role Specialist agents and specialist agents that have been added will appear in the AI Chat menu. As in Figure 4.6, there is an Instagram Content Specialist agent specialist, or chat expert.

7. Planning page admin – Dashboards
Admin page design – The dashboard can be seen in Figure 13.

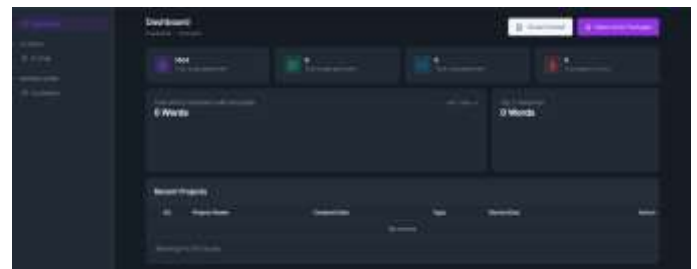


Figure 13. Admin Page – Dashboard

Figure 13 shows the admin page in the dashboard menu. Admin can see information regarding the total number of words that have been answered by specialist agents as a whole which can be seen on the Total Words Generated card. On the Total Words Generated card there is 1604 information, which means the agent specialist has answered the user's question with 1604 words. Then on the total image generate card, it means displaying information about the number of images that have been answered by the agent specialist. Apart from that, the dashboard page displays information on the list of existing projects, namely project name, project creation date, and project type.

8. page design – AI Chat Expert
of the User – AI Chat Expert page can be seen in Figure 14.

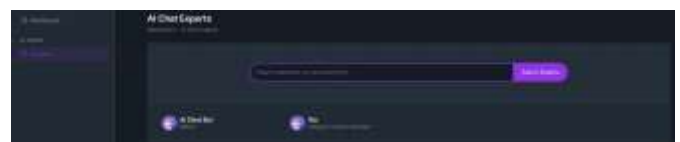


Figure 14. User Page – AI Chat Expert

Figure 14 shows the user page on the AI Chat menu. On the AI Chat menu, users can select Agent Specialist (Chat Expert). Then the user can send questions to the specialist agent via the available chat column. For example, if a user wants to ask or consult regarding creating content concepts for endorsements or selling on Instagram social media but doesn't have an idea yet, the user can choose a specialist agent (chat expert): Instagram Content Specialist and the user can convey the desired needs in the available chat column.

9. page design – AI Chat
of the User – AI Chat page can be seen in Figure 15.



Figure 15. User Page – AI Chat

Figure 15 shows the *user page* on the *AI Chat* menu. The *AI Chat* menu is a place for *users* to ask *agent specialists* (*chat experts*) about problems that occur, or needs required by the *user*. *Specialist agents* will answer questions from *users* and provide references and ideas to help *users* solve problems.

IV. CONCLUSION

The design of an artificial intelligence-based content creation system using the *UML approach* has been successfully created. This system is expected to make it easier for content creators to generate new content ideas, increase production consistency, and adapt to changing trends as well as provide practical implementation recommendations for content creators.

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