

AI-Powered Automated Advertisement Video Generation System

Pranav Jadhav¹, Akshita Bachhav², Krushna Shirsath³, Ganesh Tare⁴ Prof.(Dr.)

N. R. Wankhade⁵

^{1,2,3,4}Students, Department of Computer Engineering

⁵Guide, Department of Computer Engineering

Kalyani Charitable Trust's Late G. N. Sapkal College of Engineering,
Anjaneri, Nashik, Maharashtra, India

Abstract - Today, in the online fashion world, brands need eye-catching videos to attract customers. But making these videos is not easy. It usually involves hiring models, doing photoshoots, and editing videos, which takes a lot of time and money. Because of this, many small clothing businesses are not able to create good advertisements regularly. AdCrafter is made to solve this problem in a simple way. User uploads a product image and adds a few details. The system automatically creates a model image, selects the best one, and makes a short ad video. User just waits and gets the final video. AdCrafter is mainly suitable for small businesses because it makes advertisement fast, efficient and affordable.

Keywords: Prompting, API's, Webhook, Supabase, AI agent, Image Generation, Video Synthesis.

1. INTRODUCTION

Nowadays, the fashion industry has become very competitive, especially with the growth of online shopping and social media platforms. Clothing brands need to regularly create and share attractive advertisements to stay connected with customers and remain visible in the market. A good advertisement can help in increasing engagement, reaching more people, and improving overall sales. Recent research also shows that automated video generation and AI-based content creation are becoming important tools in digital marketing [2]. However, creating such advertisements is not easy. It usually requires design skills, marketing knowledge, and access to expensive tools or professional agencies. Because of this, many small clothing businesses find it difficult to keep up with the demand for regular content. Small businesses do not have time or too much money to make advertisement videos for every new product. AdCrafter creates advertisement videos for clothes automatically. You just upload a photo of your product and give a few simple details. After that, the system does everything by itself. It creates a model wearing your product and turns it into a video advertisement. You don't need to hire a model, then take photos and after that edit those photos to make an advertisement video. So AdCrafter makes this process simple and also saves time, money and manual efforts. With recent developments in Artificial Intelligence, it has become possible to generate images and videos automatically. AI-based systems can now create realistic visuals and promotional content within minutes. But most existing tools are general-purpose and not focused on systems [3]. Once multiple images are generated, the system

specifically on clothing advertisements. AdCrafter is developed to fill this gap. It is specially designed for clothing brands and helps them generate ready-to-use advertisements by simply uploading a product image and entering basic model preferences.

2. LITERATURE SURVEY

Recent research in Artificial Intelligence has shown major improvements in image and video generation. AI can create very real-looking images just from text descriptions. This helps in showing products clearly and making advertisements more easily. Other research papers show that AI can generate real clothing images, which makes online fashion look more attractive. This shows that AI can be more useful for creating advertisement videos. In marketing, AI is used to create ads based on user preferences and target audience. This is similar to AdCrafter, where ads are created using simple inputs given by the user. In some research papers, it is mentioned that AI can handle the full process of advertisement creation and helps save time and reduce manual work. Also, workflow tools help manage all these steps properly, especially when many tasks like image and video creation are involved. Even though there are many studies on AI in fashion and advertising, most of them focus only on specific parts like virtual try-on or video generation [3], [5]. Very few works combine everything together, like automation tools, cloud storage, and different AI APIs, into one complete system. AdCrafter tries to connect all these parts and build a practical solution that works well for clothing advertisement creation.

3. PROPOSED SYSTEM

The system AdCrafter is a system built for making advertisement for clothing videos mainly for small businesses which cannot afford high-cost advertisement creation by hiring models, photoshoots and editing. Instead of going through a manual process, the user uploads a product image and selects the few details about the model, like gender, skin tone, body type, and pose. After getting this input, the system first understands the product and improves the prompt so that better and more realistic results can be generated, similar to how modern AI systems refine inputs to get higher quality output [2]. Then, it uses AI image generation to create images of a model wearing the product, while trying to keep the clothes properly aligned and visually accurate, which is an important idea in virtual try-on. It selects the best one and turns it into a short advertisement video using AI video generation methods. These methods are based

on diffusion techniques, which help in creating smoother and more realistic videos [5], [7]. Meanwhile, everything runs in the background, and the system keeps track of progress using a cloud database so the user can see when the video is ready.

4. SYSTEM OVERVIEW

Adcraftor is use to make an advertisement creation easy for small businesses for clothing products using AI. The main idea is to remove traditional methods like photoshoots and manual video editing and instead use a fully automatic, cloud based process. The user simply uploads a product image and gives a few basic details about the model, such as gender, skin tone, hair length, body type, and pose. Then the input , product image analyze by the system and improves the prompt so that better results can be generated. Because of this AI produce higher quality outputs. Then it uses AI image generation to create real images of a model wearing the product, making sure the product looks properly fitted and visually correct, like in virtual try-on systems. From these generated images, the best one is selected. After that, the selected image is changed into a short advertisement video using AI video generation, which makes the result smooth and realistic. The system works in steps automatically. The user uploads an image on a website and enters model details. The generated image is saved in cloud storage, and there is link between frontend and backend by webhook so this image are then send to backend. Then backend gives a job ID so the user can track the process. After this, all work happens in the background. The system creates prompts, generates model images, selects the best output, and finally creates the advertisement video. All the steps are automatically processed by the system . The system updates the job status in a cloud database, and when the video is ready, then we can download, store and share that video. On the frontend, the system continuously checks the job status using the job ID. When the process is completed, the final video is shown to the user. This all steps make the process simple and automatic so that user only uploads the product image and after selecting few things like body type, gender, skin tone and we finally get advertisement video without any manual work.

5. ALGORITHM

Input: Product image and basic model feature details

Output: Final advertisement video

- 1) The system gets a product image and some basic model details from the user.
- 2) It creates new task in the system and gives job ID to it so the user can track the processing

- 3) The system analyze the product image and under stands image features like colour, type, and style.
- 4) Using image details and user input, it generates AI prompt for good results.
- 5) The prompt we generate in an above step is sent to AI, which generates image of a model wearing the product.
- 6) The generated image is used to create a short advertisement video using AI.
- 7) The system keeps checking the process until the video ready. Once done, it saves the video link in the database and marks the job as “done.”
- 8) The frontend sees the update and shows the final advertisement video to the user.

6. WORKFLOW OF THE PROPOSED SYSTEM

The working of the system follows a structured auto mated pipeline:

- 1) User uploads a product image and enters model preferences on the web frontend .
- 2) The image is uploaded to cloud storage and the system triggers the backend automation workflow.
- 3) The backend immediately returns a job ID and begins processing asynchronously.
- 4) The system analyzes the product image and extracts visual features.
- 5) An optimized AI prompt is generated automatically using extracted features and user inputs.
- 6) AI generate realistic model image of the product being worn.
- 7) The generated image is selected and passed to the video synthesis API.
- 8) A short promotional advertisement video is generated with motion effects and transitions.
- 9) The job record is updated in the cloud database with the final video URL.
- 10) The frontend polls the status endpoint and displays the completed video to the user.

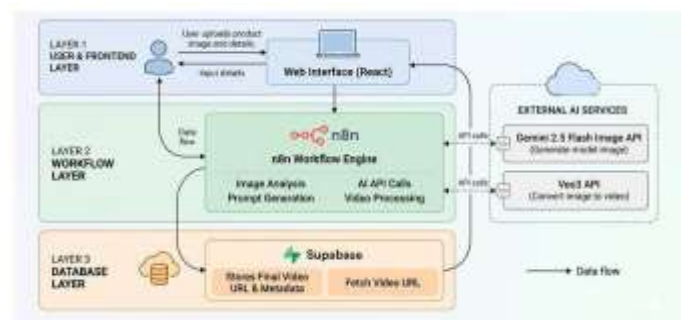


Fig. 1. Workflow of the Proposed System

7. SYSTEM ARCHITECTURE

AdCrafter follows a modular and automated architecture that converts a static product image into a short promotional advertisement video

A. Frontend Layer

The frontend is the part that the user interacts with. It is a simple web application where the user uploads a product image and selects details like gender, skin tone, body type, hair, and pose. Once the user submits this, the image is stored online, and the system sends all the information to the backend. The user also gets a job ID, which helps them track the progress. The frontend keeps checking the status after every few seconds and shows the final video once it is ready.



Fig. 2. Adcrafter workflow pipeline

B. Backend Workflow Automation Layer

The backend handles all the main processing work. It uses a workflow automation system to manage each step properly. When the request is received, it creates a job record and starts processing in the background. It then performs tasks like analyzing the image, generating prompts, creating images, and generating videos. Work flow automatically perform all this tasks so it helps in handling all these steps smoothly and without manual control [4].

C. Image Understanding and Feature Extraction Layer

In this step, the system looks at the uploaded product image and tries to understand it. It identifies important details like colour, texture, pattern, and type of clothing. These basic features details of the model are important because they help the system generate outputs that match the original product. This idea is commonly used in virtual try-on systems to maintain visual consistency [3].

D. Prompt Engineering Module

Here, the system creates a proper and detailed prompt using the extracted features and user inputs. A good prompt helps the AI generate better and more real results. Many modern AI systems depend on well-structured prompts to improve quality of output[2].

E. Image Generation Module

This module uses AI to generate images of a model wearing the product.

F. Video Synthesis Module

Here, the selected product image is converted into advertisement video actually the video is short. The system adds small parts of each image and effect so that video look more attractive and real These improvements are inspired by diffusion-based video generation methods, which are known for producing smooth and high-quality videos [5], [7].

G. Cloud Database Layer

The system uses a cloud database to keep tracking of each task or processes . It store the details of each job ID so that it tracks the process and it also having current status, and final video link. This helps the frontend and backend work independently without affecting each other. It also allows the user to check progress easily without waiting, making the system faster and more user friendly.

8. IMPLEMENTATION DETAILS

A. Frontend Implementation

The frontend is built using React with TypeScript, providing a responsive and accessible user interface. It handles product image upload to cloud object storage (Supabase Storage), form validation, asynchronous backend communication, and job status polling. The polling mechanism queries the status webhook every five seconds and renders the final video inline once the job is marked as complete.

B. Backend Workflow Implementation

The workflow automation backend is implemented using n8n, a cloud-hosted workflow automation platform. The main workflow consists of a webhook trigger, image analysis node (using a multimodal AI model), an AI agent node for prompt construction, HTTP request nodes for calling the image and video generation APIs, wait and-poll loops for async API responses, and Supabase database nodes for job record management. A separate n8n workflow handles status queries from the frontend, fetching the job record by ID and returning the current status and video URL.

C. Image Generation Implementation

Here the system uses existing AI tools for creating images instead of building a model from scratch .it does not built model from scratch . It mainly focuses on writing a good prompt so that the generated images look realistic. The system also makes sure that the product's colour, texture, and design stay the same, and that the clothes look properly fitted on the model.

D. Video Generation Implementation

After selecting the best image, the system uses it to create a short advertisement video. It adds small parts of simple movements, camera effects, so the video looks smooth and

attractive. The final video is also adjusted so it looks good on platforms like Instagram or YouTube.

E. Workflow Automation and Async Job Tracking

All the steps in the system are connected automatically, so the user doesn't have to do anything after submitting the input. Once the request is sent, the system gives a job ID and starts working in the background. This keeps the website fast and responsive. The system also handles errors properly, so even if something goes wrong, it can manage it without stopping the whole process. For generating the final video it usually takes 3 to 5 minutes.

9. RESULTS AND ANALYSIS

A. Observed Results

The system successfully:

- Accepts product images and model parameters through an intuitive web interface
- Converts static product images into realistic human model images using AI generation
- Generates short promotional advertisement videos with smooth motion and transitions
- Preserves product texture and colour accuracy throughout the generation pipeline
- Tracks job progress in real-time and delivers results to the frontend asynchronously
- Produces social-media-ready advertisement content without any manual intervention

B. Performance Comparison

- 1) Compared to traditional advertisement methods, this system is much easier and faster.
- 2) In normal methods, we need models, photographers, studios, and editing work. This takes more time and money. This system removes all of that.
- 3) It reduces cost because no models or studios are needed. It generates the advertisement video in just 3 to 5 min because of that it save time .
- 4) Another benefit is that the user does not need any design or editing skills. Everything is done automatically, so there is no need to depend on agencies or complex tools.

C. Quality Analysis

- 1) The quality of the output is good.
- 2) The model images look realistic, and the clothes keep their original color and texture.
- 3) Output of the product image is smooth and in cludes motion and transaction in video

- 4) Overall, the final advertisement is good and can be used on social media platforms.



Fig. 3. Input and Observed Results

D. Limitations

There are some limitations in the system.

- 1) If the clothing design is very complex, small visual errors may happen.
- 2) If the product image is of low quality then the output may not be look real.
- 3) The time taken to generate results may change depending on how fast external AI services respond.
- 4) Also, when longer videos are created, the smoothness and consistency of motion may reduce.

10. CONCLUSION AND FUTURE SCOPE

The system Adcraftor shows using AI and cloud technology it is easier to create advertisement video without any manual work Instead of doing everything manually, the system handles the full process. It takes the product image, understands it, and then creates the final advertisement video. This saves both time and money, while still giving good results.

This system is very useful for small and medium businesses. small business which having low budget they also promotes their products using this system. Also, the system is flexible, so it can be improved easily in the future when better AI tools are available.

A. Future Scope

In the future, this system can be improved in many ways:

- 1) Voice-over and background music can be added automatically to make ads better.
- 2) using multiple scenes more advanced video is creating by the system.
- 3) It supports more and different languages so that can help peoples for using this platform.
- 4) Ads can be made more personal based on user choices.
- 5) 3D features can be added to show products in a more realistic way.
- 6) The system can be directly connected with e commerce websites so users can create ads with just one click.

REFERENCES

- 1) M. Wei, C. Yu, J. Zhou, and F. Wang, "3DV-TON: Textured 3D Guided Consistent Video Try-on via Diffusion Models," Apr. 2025.
- 2) D. Qian, K. Su, Y. Tan, et al., "VC-LLM: Automated Advertisement Video Creation from Raw Footage using Multimodal LLMs," Apr. 2025.
- 3) J. Wang, W. Sun, M. Li, Y. Zheng, F. Li, Z. Tao, D. Di, H. Li, W. Chen, and X. Huang, "Chrono Tailor: Harnessing Attention Guidance for Fine-Grained Video Virtual Try-On," Jun. 2025.
- 4) A. Smith and B. Jordan, "Video Diffusion Generation: Comprehensive Review and Open Problems," Aug. 2025.
- 5) A. Melnik, M. Ljubljana, C. Lu, Q. Yan, W. Ren, and H. Ritter, "Video Diffusion Models: A Survey," May 2024.
- 6) X. Chen, Y. Zhang, and H. Wu, "A Markov Chain Approach for Video-Based Virtual Try-On with Denoising Diffusion GAN," Sept. 2024.
- 7) A. Gupta, L. Yu, K. Sohn, X. Gu, M. Hahn, F.-F. Li, and I. Essa, "Photorealistic Video Generation with Diffusion Models," Nov. 2024.
- 8) H. Nguyen, Q. N. Q. Nguyen, K. Nguyen, and R. Nguyen, "SwiftTry: Fast and Consistent Video Virtual Try-On with Diffusion Models," Dec. 2024.
- 9) J. Karras, Y. Li, N. Liu, L. Zhu, I. Yoo, A. Lugmayr, C. Lee, and I. Kemelmacher-Shlizerman, "Fashion-VDM: Video Diffusion Model for Virtual Try-On," Dec. 2024.
- 10) J. Zeng, D. Song, W. Nie, H. Tian, T. Wang, and A. Liu, "CAT DM: Controllable Accelerated Virtual Try-on with Diffusion Model," Nov. 2023