# Goal-Oriented Social Feed Optimizer

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## Abstract

*In recent years, social media platforms such as YouTube, Instagram and Facebook have become indispensable sources of information, learning, and entertainment. However, the recommendation algorithms used by these platforms are optimized for engagement rather than productivity, often exposing users to irrelevant and distracting content. This results in loss of focus, reduced learning efficiency, and increased screen time without meaningful outcomes. This paper proposes Goal-Oriented Social Feed Optimizer (GOSFO), an AI-based system that aligns digital content consumption with user-defined learning or career objectives. The system integrates Natural Language Processing (NLP), semantic similarity models, and browser automation to identify, filter, and promote goal-relevant content while suppressing irrelevant distractions. Experimental usage demonstrates improved relevance in content recommendations and increased productive screen time.*
*Keyword: Social Media| NLP| Recommender Systems| Browser Automation| Digital Well-being| Machine Learning.*

## 1. Introduction

Social media platforms such as YouTube, Instagram, and Facebook have increasingly become integral sources of information, education, and professional interaction. These platforms rely on machine learning-based recommendation systems that prioritize maximizing user engagement by recommending content aligned with past behavior patterns. Although such systems are effective in capturing user attention, they often emphasize trendy, humorous, or entertainment-oriented content. This leads to a misalignment between what the user intends to learn and what the algorithm continues to promote, especially when users access these platforms for academic or career-oriented objectives. For students and self-learners who depend on online content to study subjects like programming, competitive exam preparation, or skill development, this misalignment becomes a significant obstacle. For example, a learner studying MERN Stack may begin watching a tutorial but soon be diverted to unrelated short videos or reels. Over time, repeated exposure to such distracting content reshapes the recommendation pattern further away from the user's learning goals. Research indicates that this type of algorithm-driven distraction contributes to reduced attention spans, procrastination behavior, and decreased learning efficiency. To address this challenge, the proposed system, Goal-Oriented Social Feed Optimizer (GOSFO), aims to realign social media recommendations with the user's intended learning goals. The system uses Natural Language Processing (NLP) to evaluate whether recommended content aligns with the user's objectives and employs automated engagement strategies to reinforce relevant content while suppressing distractions. By influencing the underlying recommendation engine in a gradual and natural manner, GOSFO helps reshape the user's feed into a more focused and learning-centric environment, enhancing productivity and enabling meaningful digital usage.

## 2. Background and Motivation

Social media platforms such as YouTube, Instagram, and Facebook are widely used for learning, professional growth, and accessing educational content. However, the recommendation algorithms behind these platforms are optimized to increase user engagement rather than to support focused learning. As a result, users who initially intend to study topics such as MERN Stack, GATE preparation, or Data

Science are frequently exposed to viral or entertainment-oriented content. This unintended diversion gradually influences user behavior and leads to reduced concentration, increased screen time, and loss of learning consistency. The motivation behind developing the Goal-Oriented Social Feed Optimizer (GOSFO) is to address this challenge by realigning social media content consumption with personal learning objectives. By filtering recommended content using NLP-based relevance analysis and reinforcing meaningful interactions through controlled engagement, the system helps redirect recommendation algorithms toward goal-related material. This enables users to maintain focus, enhance productivity, and transform social media into a more effective and purposeful learning environment

## 3. Survey Findings and Motivation for System Development

To understand the real impact of YouTube distractions on students, a survey was conducted among 104 respondents across different academic years. The results clearly highlighted the seriousness of the problem. As shown in the pie chart below, 52% of students reported that they often open YouTube with the intention to study but end up watching unrelated videos, while an additional 23.5% admitted this happens frequently. This means that more than 75% of students experience unintentional diversion while studying on YouTube. These findings strongly validate the need for an AI-based system that can minimize distractions and help students stay aligned with their learning goals. Based on this significant user feedback, the development of the Goal-Oriented Social Feed Optimizer (GOSFO) was initiated to directly address these challenges
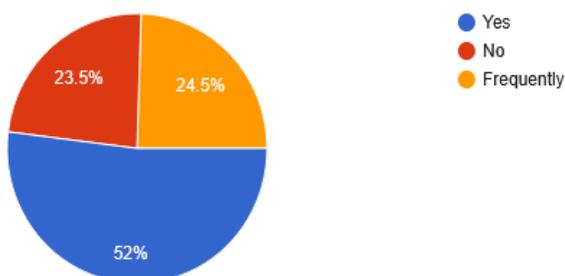


**Figure 1** Survey Pie Chart

## 4. Literature Review

The research work titled "Recommendation Systems for Personalized Learning: A Data-Driven Approach in Education" by S. B. Joshi and S. S. Katti, published in 2023, discusses how recommendation models such as collaborative filtering and content-based filtering can improve learning outcomes by delivering personalized educational content. The paper highlights that personalized recommendations can support learners in accessing relevant study materials efficiently. However, the study focuses on structured e-learning platforms and does not address the challenge of filtering unstructured content from open social media ecosystems. [I] The study titled "A Digital Recommendation System for Personalized Learning to Enhance Online Education" by R. Meena et al., published in IEEE Access in 2024, examines the role of deep learning and hybrid recommendation architectures in tailoring learning content based on user profiles. The paper emphasizes the importance of personalization in digital learning environments, but it mainly focuses on educational platforms rather than mixed-purpose platforms like YouTube or Instagram, where distracting content is prevalent. [II] The research paper "Potential Web Content Identification and Classification System using NLP and ML Techniques" by V. S. Kumar and P. L. Rao (2023) explores the use of Natural Language Processing to classify and filter online content based on context and meaning. The system uses transformer-based models to detect relevance, demonstrating high accuracy in content classification. However, the study does not consider the behavioral reinforcement aspect required to influence recommendation algorithms over time. [III] Another study titled "Technology Distraction in Generation Z: Effects on Consumer Responses, Sensory Overload, and Discomfort" by K. Priporas et al., published in the International Journal of Information Management in 2024, analyzes how social media-driven distraction affects attention span and productivity among young learners. The authors report that algorithmic exposure to entertainment-oriented content leads to cognitive overload and reduced ability to focus on educational activities. This emphasizes the need for systems that control or

redirect user attention toward goal-oriented content. [IV]

## 5. Existing system

Current social media platforms such as YouTube, Instagram and Facebook rely on recommendation algorithms designed primarily to maximize user engagement and platform retention. These algorithms analyze user interactions, including watch time, likes, shares, comments, and browsing patterns, to generate a personalized feed. While this approach ensures higher platform activity, it does not consider whether the recommended content aligns with the user's learning or professional development goals. As a result, users who access these platforms for educational purposes are frequently exposed to distracting entertainment-oriented or viral content, which leads to loss of focus and decreased learning efficiency. Some existing tools attempt to mitigate digital distraction, such as screen-time trackers, website blockers, and productivity reminder applications. However, these solutions work by restricting access rather than intelligently guiding users toward goal-relevant learning content. They do not influence or modify the recommendation engine itself, which continues to promote non-productive content. Therefore, the current systems lack the ability to realign algorithmic recommendations with user-defined goals, indicating the need for a more adaptive and goal-oriented content filtering solution.

## 6. Objective and Scope

The primary objective of the Goal-Oriented Social Feed Optimizer (GOSFO) is to help users maintain focus and improve learning productivity by aligning social media content with their personal educational or professional goals. The system aims to reduce digital distractions and optimize content recommendations through intelligent filtering and automated engagement. Key objectives include:

- Goal-Aligned Content Filtering: Identify and prioritize content that supports the user's defined learning or career objectives using semantic relevance analysis.
- Reduction of Distractions: Automatically de-emphasize or skip entertainment-oriented or irrelevant content to help users maintain concentration.

- Adaptive Recommendation Training: Influence the platform's recommendation behavior by reinforcing interactions with goal-relevant content, gradually reshaping the feed.
- Productive Screen-Time Improvement: Increase the percentage of useful content consumed, enabling more effective learning and reduced wasted time.
- User Awareness and Progress Tracking: Provide visual analytics and engagement metrics to allow users to monitor their learning focus and behavioral improvement.

The scope of GOSFO includes the design, development, and deployment of an AI-driven feed optimization system that operates alongside major social media platforms. The system utilizes NLP-based content relevance detection, automated browsing interactions, and a dashboard for monitoring user progress. Key scope areas include goal configuration, semantic content filtering, engagement automation, usage analytics, and personalized learning support. The system does not modify social media algorithms directly but works by shaping user interaction patterns to guide recommendation outcomes over time.

## 7. Modules

- The proposed Goal-Oriented Social Feed Optimizer (GOSFO) system is divided into several functional modules, each responsible for a specific stage of content filtering, recommendation shaping, and user feedback. The main system modules are as follows:
- **Goal Configuration Module:** This module allows the user to define their learning or professional goals (e.g., "Learn MERN Stack", "Prepare for GATE"). Keywords and related topics are extracted and stored to serve as reference points for relevance evaluation.
- **Content Extraction Module:** This module collects data from the user's social media feed such as video titles, descriptions, captions, hashtags, and engagement metadata. The extracted content is preprocessed for semantic analysis.

- **NLP-Based Relevance Classification Module:** Using transformer-based models (e.g., BERT or RoBERTa), this module evaluates the semantic similarity between the extracted content and the user's defined goals. Each content item is classified as Relevant or Irrelevant.
- **Automation and Engagement Module:** This module uses browser automation tools (e.g., Puppeteer/Playwright) to simulate natural user actions. Relevant content is automatically liked, saved, or viewed longer, while irrelevant content is skipped. This guides the platform's recommender system to prioritize goal-aligned content.
- **Database Management Module:** This module stores user goals, relevance classification results, watch/skip decisions, and interaction logs. The stored data supports progress tracking and system learning.
- **Dashboard and Analytics Module:** This module provides users with visual insights related to their progress. It displays metrics such as percentage of relevant content consumed, time saved from distraction, and weekly improvement trends. This helps users understand and improve their digital learning habits.

## 8. System Architecture

The architecture of the Goal-Oriented Social Feed Optimizer (GOSFO) is designed to integrate content relevance analysis, automated engagement, and user progress monitoring into a unified workflow. The system operates as an external intelligent layer that interacts with social media platforms without modifying their internal algorithms. Instead, it influences recommendation patterns through controlled and goal-aware interaction behaviors. The architecture consists of six primary components: Goal Configuration, Content Extraction, NLP-Based Relevance Engine, Automation Engine, Database Management, and Dashboard Interface The Goal Configuration Module allows users to define their study interest or skill development objectives. The Content Extraction Module then continuously retrieves 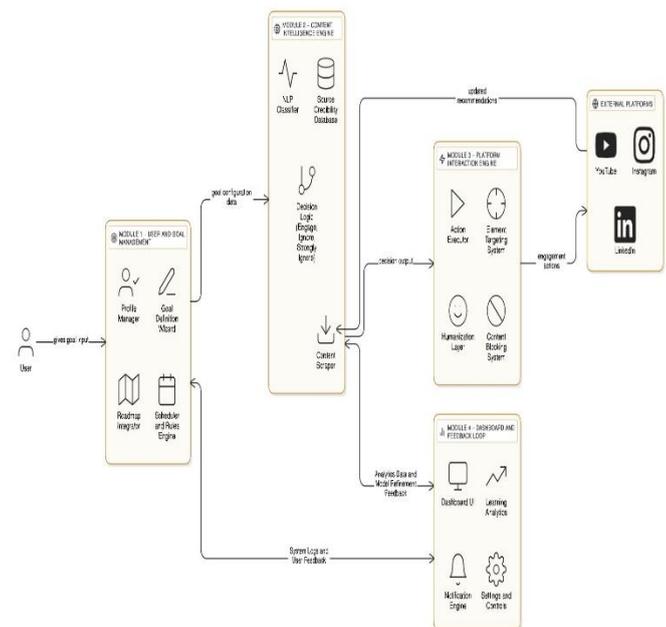video titles, descriptions, captions, and hashtags from the social media feed. This data is forwarded to the NLP-Based Relevance Classification Module, where transformer-based semantic similarity models analyze and determine whether content aligns with the user's defined goals. Based on this classification, the Automation and Engagement Module simulates natural watch, like, skip, or ignore behaviors using browser automation tools to reinforce relevant content and suppress distractions. All content interaction decisions and relevance outcomes are stored in the Database Management Module, enabling long-term tracking and pattern analysis. Finally, the Dashboard and Analytics Module visualizes key user metrics, such as relevant content ratio, distraction rate reduction, and progress over time. This feedback loop enables users to monitor their digital behavior and supports continuous improvement in content focus and learning efficiency.



**Figure 2** System Architecture of GOSFO

## 9. Implementation

The implementation of the Goal-Oriented Social Feed Optimizer (GOSFO) involves the integration of Natural Language Processing models, browser automation frameworks, and a web-based dashboard for real-time monitoring. The system is developed

using a modular approach to ensure flexibility, scalability, and ease of maintenance. The frontend dashboard is built using React.js, allowing users to configure their learning goals, view performance insights, and monitor progress over time. The dashboard communicates with the backend through RESTful APIs. The backend is implemented using Node.js and Express.js, which manages API requests, system logic orchestration, and data flow between modules. For content relevance evaluation, the backend interacts with a Python-based NLP service, where transformer models such as BERT or Sentence Transformer are used to compute semantic similarity scores and classify content as relevant or irrelevant.
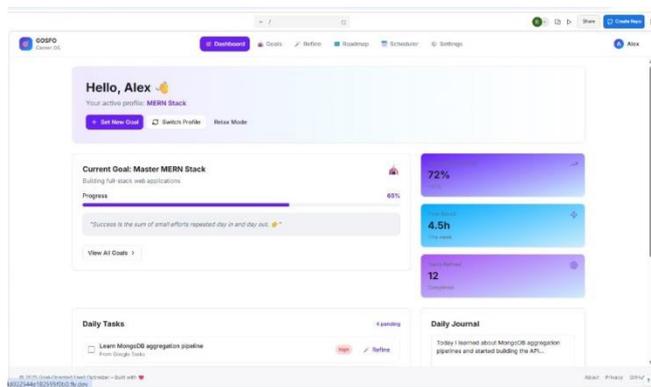


To influence social media recommendation behavior, the system uses Puppeteer/Playwright, a browser automation framework that simulates natural user interactions. Relevant content is automatically engaged with (e.g., like, save, longer watch time), while distracting content is skipped. This gradual interaction adjustment helps retrain the platform's recommendation algorithm in alignment with user goals. A MongoDB database is used to store user goals, classification outcomes, and engagement logs, which are later visualized on the dashboard through charts and usage statistics. The implementation ensures data privacy by securing user credentials through OAuth authentication and encrypted session storage.

## Conclusion

The Goal-Oriented Social Feed Optimizer (GOSFO) addresses the growing challenge of digital distraction caused by engagement-driven social media recommendation algorithms. By integrating NLP-based semantic content filtering and automated engagement reinforcement, the system realigns a user's social media feed with their educational or professional goals. Instead of blocking platforms or restricting usage, GOSFO adapts interaction patterns to gradually influence the recommendation engine itself, promoting meaningful and goal-relevant content while reducing exposure to irrelevant or entertainment-oriented material. The implementation of GOSFO demonstrates that social media platforms can be transformed into effective and personalized learning environments when supported by intelligent filtering and behavior-guidance mechanisms. The system enables users to maintain focus, improve productive screen time, and achieve greater consistency in self-learning. In the long term, GOSFO contributes to better digital well-being and fosters intentional knowledge acquisition in an online ecosystem that is otherwise dominated by distraction-oriented algorithms.

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