PCA -2 ASSIGNMENT

Topic: Report on Content Management System (CMS)

For

[BCAC 591]: PHP WITH MYSQL LAB

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Introduction

A **Content Management System (CMS)** is a powerful web-based platform designed to help users create, manage, and publish digital content easily without requiring deep programming expertise. It provides a structured environment where administrators, authors, and visitors can interact seamlessly.

This project focuses on developing a **Blog Content Management System (Blog CMS)** using **PHP and MySQL**, ensuring a balance between functionality, usability, and data security. The system allows registered authors to securely log in, create and edit blog posts, manage comments, and track activities through a user-friendly dashboard. Visitors can explore the latest posts, read full articles, search for topics of interest, and engage through likes, dislikes, and comments.

The interface is designed using modern web technologies such as **HTML, CSS, and JavaScript**, ensuring that the application remains responsive across all devices. Overall, this CMS provides a practical understanding of how a complete dynamic website operates, integrating both frontend and backend functionalities in a real-world web environment.

Purpose

The main purpose of this CMS project is to build a **secure, interactive, and efficient platform** for managing blog content. It aims to simplify the workflow of content creators while delivering an engaging reading experience for visitors.

Key objectives include:

- **Providing an easy-to-use Admin Panel** that allows authors to create, update, delete, and publish posts efficiently.
- **Offering a responsive frontend layout** where readers can view, search, and interact with blog content seamlessly.
- **Maintaining strong data protection** by implementing password hashing, prepared SQL statements, and secured session handling in PHP.
- **Enhancing accessibility and discoverability** through a keyword-based search system and structured post categorization.
- **Encouraging user engagement** via interactive features like comments and reactions.

This CMS represents a complete practical implementation of **full-stack web development** principles, combining PHP for backend logic, MySQL for data management, and modern web design tools for an appealing user experience.

Software Requirements Specification (SRS)

1. <u>Core Features & System Work Flow</u>

1.1 Author Features (Admin Panel)

The admin panel will provide tools for authors to manage their content securely.

1. **Secure Login System**

   - Authors must log in with valid credentials (username and password) to access the admin dashboard.
   - Passwords are **hashed** (converted into an encrypted form using PHP's password_hash() function) before being stored in the database, ensuring that even if the database is exposed, the real passwords remain protected.
   - During login, PHP's password_verify() checks the entered password against the hashed one (it safely compares the encrypted hash instead of plain text).

2. **Admin Dashboard**

   - Displays all posts created by the logged-in author.
   - Shows the title, creation date, and status (published or draft).
   - New comments will be displayed on homepage once approved by the admin.
   - Includes an Activity Logs feature that records all admin and author actions (such as post creation, edits, and deletions), with data stored directly in the database for tracking purposes.
   - Allows the Admin to edit profile details, block the authors (as per the need) created by authors and delete posts to maintain content accuracy and quality.

3. **Create New Post**

   - Authors can create a new blog post by providing a title, content body and image(5 MB).
   - Each post will be timestamped and associated with the author.

4. **Edit Existing Post**

   - Authors can update the content or title of their existing posts.

5. **Delete Post**

- Authors can permanently delete posts from the database.

6. **Secure Logout**

- Session-based **logout functionality** ensures that once a user logs out, their active session is destroyed using session_unset() and session_destroy(), (this clears all stored session data from the server).

- This prevents **unauthorized access** by ensuring that no one can reopen the dashboard using the old session after logout.

1.2 Public Visitor Features (Frontend)

The frontend provides visitors access to all published posts in a structured and aesthetic layout.

1. **Homepage Display**
   - Lists all published posts in **reverse chronological order** (newest first).
   - Each entry displays the post title, author's name, and publication date.

2. **Full Article View**
   - Clicking a post title navigates to a separate page showing the **entire article content**.

3. **Simple Navigation**
   - Clean, responsive interface using HTML, CSS, and JavaScript.

4. **Visitor Interaction**
   - Visitors can engage with blog posts by viewing the total number of views, liking or disliking posts, and adding comments under each blog entry.

5. **Search Functionality**
   - A keyword-based **search feature** allows visitors to quickly find posts by title, author name, or content keywords, enhancing user accessibility and convenience.

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2. <u>Basic Security Features</u>

1. **Password Hashing:**

   - Passwords are hashed using PHP's `password_hash()` before storage (**converts plain password into secure encrypted form**).

   - During login, validation is done via `password_verify()` (**checks if entered password matches the stored hash**).

2. **SQL Injection Prevention:**

   - All database queries are executed using **prepared statements (MySQLi)** (**prevents direct SQL code execution by attackers**).

3. **Session Security:**

   - Secure session handling ensures authors remain authenticated only during active sessions (**uses PHP'S `session_start()`, `session_regenerate_id()`, and secure cookie flags**).

   - These steps ensure PHP sessions safely track **logged-in** users and are fully erased after **logout** to prevent unauthorized reuse.

4. **Access Control:**

   - Admin panel pages are accessible only to logged-in authors (**checks active session before granting access**).

5. **Form Validation:**

   o Server-side input validation to prevent malicious or malformed data entries.

   o Error messages are shown to users when they submit incorrect login credentials (**improves user feedback while maintaining security**).

Database Schema and ER Diagram

Database Name: blog_cms

blog_cms

activity_logs

Column	Type	Null	Default	Links to	Comments	Media type
id *(Primary)*	int(11)	No				
user_id	int(11)	No		users -> id		
action	varchar(255)	No				
description	text	Yes	NULL			
ip_address	varchar(45)	Yes	NULL			
created_at	timestamp	No	current_timestamp()			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	21	A	No	
idx_user_id	BTREE	No	No	user_id	4	A	No	
idx_created_at	BTREE	No	No	created_at	21	A	No	

posts

Column	Type	Null	Default	Links to	Comments	Media type
id *(Primary)*	int(11)	No				
author_id	int(11)	No		users -> id		
title	varchar(255)	No				
slug	varchar(255)	No				
content	longtext	No				
excerpt	varchar(500)	Yes	NULL			
status	enum('draft', 'published', 'archived')	Yes	draft			
featured_image	varchar(255)	Yes	NULL			
views	int(11)	Yes	0			
likes	int(11)	Yes	0			
dislikes	int(11)	Yes	0			
created_at	timestamp	No	current_timestamp()			
updated_at	timestamp	No	current_timestamp()			
published_at	timestamp	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	4	A	No	
slug	BTREE	Yes	No	slug	4	A	No	
idx_author_id	BTREE	No	No	author_id	2	A	No	
idx_status	BTREE	No	No	status	4	A	Yes	
idx_slug	BTREE	No	No	slug	4	A	No	
ft_title_content	FULLTEXT	No	No	title			No	
				content			No	

post_comments

Column	Type	Null	Default	Links to	Comments	Media type
id (Primary)	int(11)	No				
post_id	int(11)	No		posts -> id		
author_name	varchar(100)	No				
author_email	varchar(100)	No				
content	text	No				
ip_address	varchar(45)	Yes	NULL			
status	enum('pending', 'approved', 'rejected')	Yes	pending			
created_at	timestamp	No	current_timestamp()			
updated_at	timestamp	No	current_timestamp()			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	3	A	No	
idx_post_id	BTREE	No	No	post_id	3	A	No	
idx_status	BTREE	No	No	status	3	A	Yes	

post_reactions

Column	Type	Null	Default	Links to	Comments	Media type
id (Primary)	int(11)	No				
post_id	int(11)	No		posts -> id		
ip_address	varchar(45)	No				
reaction	enum('like', 'dislike')	No				
created_at	timestamp	No	current_timestamp()			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	2	A	No	
unique_reaction	BTREE	Yes	No	post_id	2	A	No	
				ip_address	2	A	No	
idx_post_id	BTREE	No	No	post_id	2	A	No	
idx_ip	BTREE	No	No	ip_address	2	A	No	

users

Column	Type	Null	Default	Links to	Comments	Media type
id (Primary)	int(11)	No				
username	varchar(100)	No				
email	varchar(100)	No				
password	varchar(255)	No				
full_name	varchar(150)	No				
role	enum('admin', 'author')	Yes	author			
status	enum('active', 'inactive', 'blocked')	Yes	active			
created_at	timestamp	No	current_timestamp()			
updated_at	timestamp	No	current_timestamp()			
last_login	timestamp	Yes	NULL			
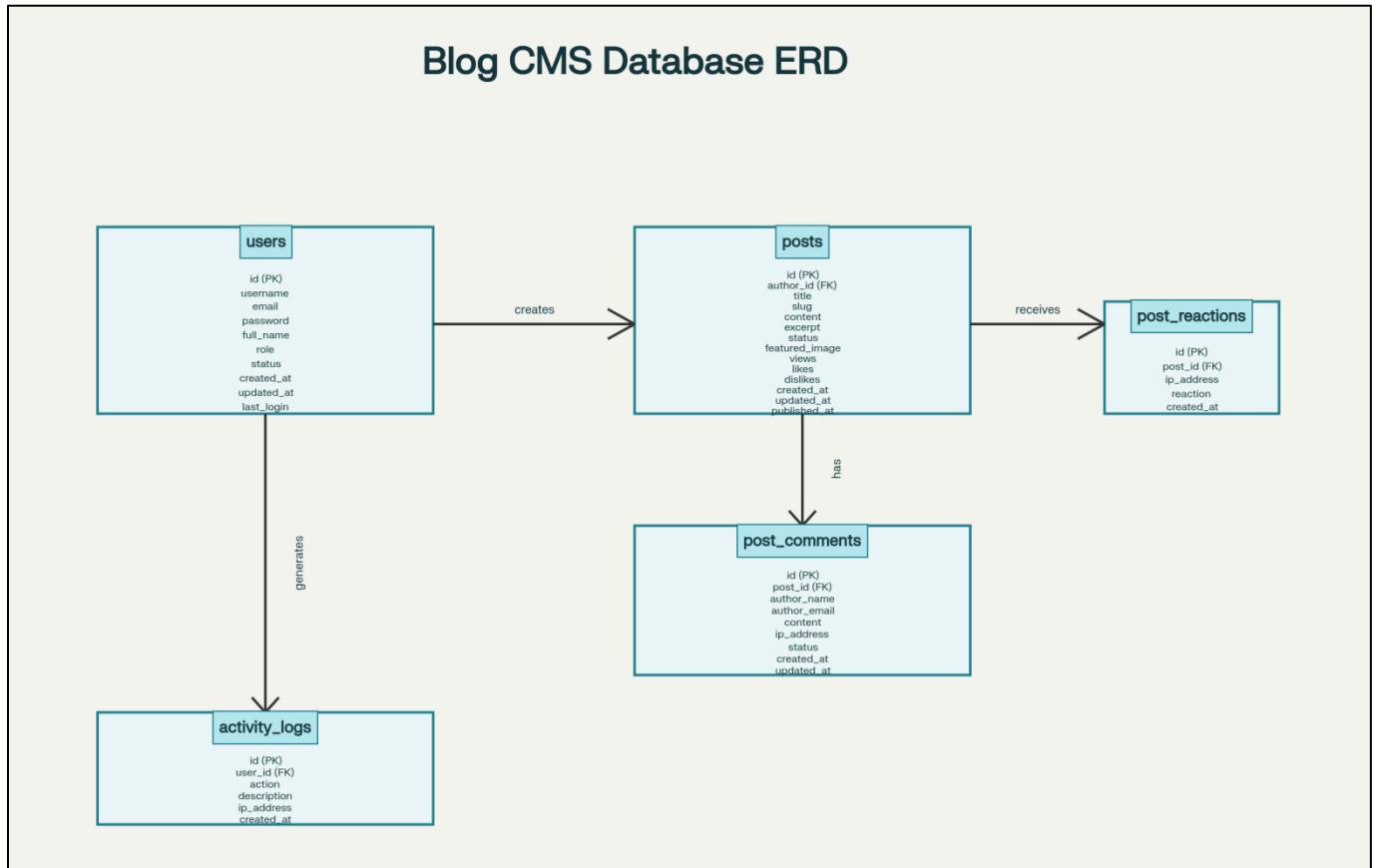
Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	id	2	A	No	
username	BTREE	Yes	No	username	2	A	No	
email	BTREE	Yes	No	email	2	A	No	
idx_role	BTREE	No	No	role	2	A	Yes	
idx_status	BTREE	No	No	status	2	A	Yes	
idx_email	BTREE	No	No	email	2	A	No	

ER DIAGRAM→

Relationships & Data Flow:

The database implements four one-to-many (1:N) relationships that form the backbone of the system's data model:

- **users → posts Relationship**
  - ➢ Each user (admin or author) can create multiple blog posts, established through the author_id foreign key in the posts table referencing users.id. This relationship enables author attribution and content ownership tracking.

- **users → activity_logs Relationship**
  - ➢ Every user action is logged through the user_id foreign key in activity_logs table, creating an audit trail that links all activities back to specific user accounts. This relationship supports security monitoring and compliance requirements.

- **posts → post_comments Relationship**
  - ➤ A single blog post can receive multiple comments from readers, connected via the post_id foreign key in post_comments table. This relationship enables threaded discussions and community engagement on individual articles.

- **posts → post_reactions Relationship**
  - ➤ Each post can accumulate numerous reactions (likes/dislikes) from different users or IP addresses, linked through the post_id foreign key in post_reactions table. This relationship powers the engagement metrics displayed on posts.

Data Flow Summary:

1. **Users** register and log in to the system, creating entries in the `users` table.
2. **Authors** publish posts stored in the `posts` table, linked through their user ID.
3. **Visitors** interact by posting comments or adding reactions, which are saved in `post_comments` and `post_reactions` tables.
4. **Activity logs** continuously record every significant user action for transparency and security.

Overall, these relationships establish a clear and efficient flow of data between the frontend and backend, maintaining system integrity, easy management, and smooth user interaction.

UI / UX

Home Page →

BLOG CMS   Home   Search   **Login**
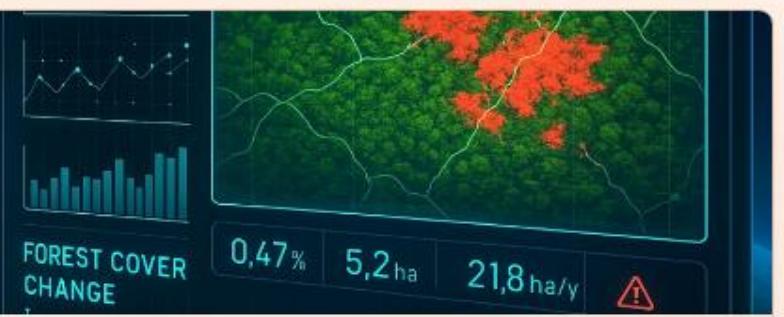
Blog CMS

Discover amazing stories, insights, and ideas from talented authors

Search Posts

Search posts by keywords...   **SEARCH**

BY PRATYUSHA_08   NOV 11, 2025   3 VIEWS

NATURE

Nature is the world around us, including plants, animals, water, air, mountains, and all living and non-living things. It provides everything we need to survive—food, water, oxygen, and shelter. Nature maintains balance in the environment through processes like rainfall, seasons, and the growth of plants and animals. It is beautiful, peaceful, and essential for human life. Protecting nature by reducing pollution, saving trees, and conserving resources helps keep the Earth healthy for future gene
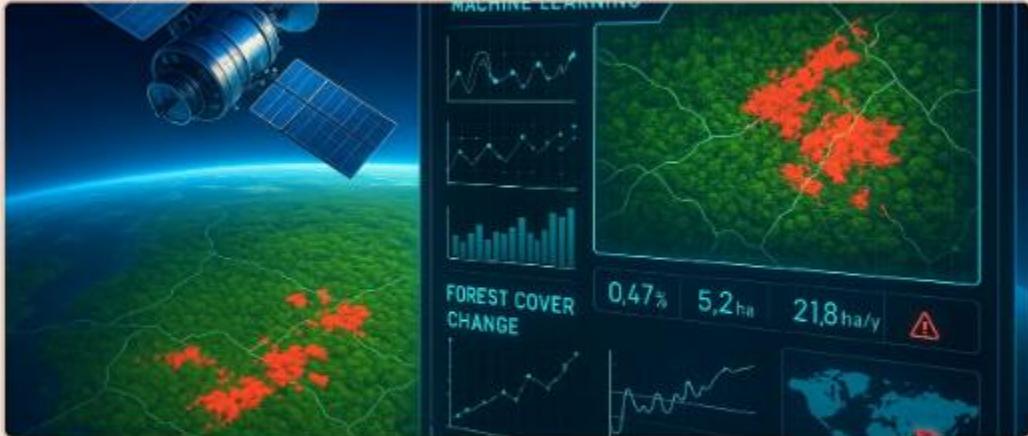
READ MORE →

To Read the full Article/Blog→

- **Viewers can show their interest by liking, disliking the post.**

BACK TO ALL POSTS

NATURE

BY **PRATYUSHA_08**   NOVEMBER 11, 2025   3 VIEWS

FOREST COVER CHANGE   0,47%   5,2ha   21,8ha/y

Nature is the world around us, including plants, animals, water, air, mountains, and all living and non-living things. It provides everything we need to survive—food, water, oxygen, and shelter. Nature maintains balance in the environment through processes like rainfall, seasons, and the growth of plants and animals. It is beautiful, peaceful, and essential for human life. Protecting nature by reducing pollution, saving trees, and conserving resources helps keep the Earth healthy for future generations.

Was this helpful?   △ 1   ⊘ 0

Comment Section Under the Blog Post→

Footer Section of The Home page→
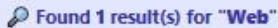
Search Article Feature→

New User Registration→

Create Account

USERNAME

EMAIL

FULL NAME

PASSWORD

CONFIRM PASSWORD

REGISTER

Already have an account? **Login here**

User Login→

Blog CMS

USERNAME OR EMAIL

pratyushamukherjee.23@nshm.edu.in

PASSWORD

••••••••

LOGIN

Don't have an account? **Register here**

Author Dashboard→

Welcome, Pratyusha_08   Change Password   Logout

Welcome to Your Dashboard
Create, edit, and manage your blog posts from here.

TOTAL POSTS

4

PUBLISHED

3

DRAFTS

0

TOTAL VIEWS

20

+ CREATE NEW POST	VIEW ALL POSTS	VIEW PUBLIC SITE

Recent Posts

TITLE	STATUS	VIEWS	CREATED	ACTIONS
IT PARK		0	Nov 11, 2025	Edit Delete
NATURE	PUBLISHED	4	Nov 11, 2025	Edit Delete
IT	PUBLISHED	9	Nov 08, 2025	Edit Delete
Web Development	PUBLISHED	7	Nov 08, 2025	Edit Delete

Create Post→

Create New Post

POST TITLE

Enter an engaging title for your post...

EXCERPT (SHORT SUMMARY)   STATUS

Brief description of your post...   Draft

FEATURED IMAGE

Choose File No file chosen

Accepted formats: JPG, PNG, GIF, WebP (Max 5MB)

POST CONTENT

Write your post content here...

POST CONTENT

Write your post content here...

Create Post   Cancel

Edit Post→

Edit Post
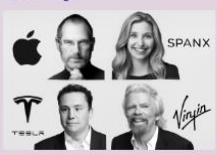
POST TITLE

Web Development

EXCERPT

Advanced Course

STATUS

Published

FEATURED IMAGE

Choose File   No file chosen

Accepted formats: JPG, PNG, GIF, WebP (Max 5MB)

Current Image:

POST CONTENT

Web development is a good skill for you to build, especially since you already work with PHP, MySQL, and frontend pages. I will keep this direct and useful so you can build confidence and move forward.

Here is the clean breakdown.

What Web Development Means

Web development is the process of creating websites or web applications that people can use on browsers. It has three main parts:

1. Frontend (Client side)

This is everything users see.
• HTML for structure
• CSS for design
• JavaScript for interaction

If you want to grow fast, you should learn:
• Responsive design
• Bootstrap or Tailwind

| Save Changes | Cancel |

Password Reset→

Change Your Password

Password changed successfully!

CURRENT PASSWORD

NEW PASSWORD

Minimum 8 characters

CONFIRM NEW PASSWORD

| Change Password | Cancel |

Admin Login→

Blog CMS

USERNAME OR EMAIL

admin@example.com

PASSWORD

••••••••

LOGIN

Don't have an account? **Register here**

Admin Dashboard (Manage Author Details , Posts & Comments)→

BLOG CMS - ADMIN PANEL   👤 admin   Logout

Welcome to Admin Dashboard
Manage all users, posts, comments and content from this centralized control panel.

TOTAL AUTHORS	PUBLISHED POSTS	TOTAL VIEWS
1	**3**	**20**

PENDING COMMENTS
0

👥 MANAGE AUTHORS   **💬 MANAGE COMMENTS**   **👁 VIEW PUBLIC SITE**

Recent Authors

USERNAME	EMAIL	JOINED	ACTIONS
Pratyusha_08	pratyushamukherjee.23@nshm.edu.in	Nov 08, 2025	View Edit

BLOG CMS - USER DETAILS   Back to Authors   Logout

Pratyusha Mukherjee

USERNAME	EMAIL	STATUS
Pratyusha_08	pratyushamukherjee.23@nshm.edu.in	ACTIVE

MEMBER SINCE	LAST LOGIN
Nov 08, 2025	Nov 12, 2025 16:35

Edit User   Delete User

User's Posts

TITLE	STATUS	VIEWS	CREATED
IT PARK		0	Nov 11, 2025
NATURE	PUBLISHED	4	Nov 11, 2025
IT	PUBLISHED	9	Nov 08, 2025

Edit User

User updated successfully!

FULL NAME

Pratyusha Mukherjee

EMAIL

pratyushamukherjee.23@nshm.edu.in

STATUS

Active

Save Changes	Cancel

All Authors

← Back to Dashboard

USERNAME	EMAIL	FULL NAME	STATUS	JOINED	LAST LOGIN	ACTIONS
Pratyusha_08	pratyushamukherjee.23@nshm.edu.in	Pratyusha Mukherjee	ACTIVE	Nov 08, 2025	Nov 12, 2025 16:35	View Edit Delete

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💬 Manage Comments

← Back to Dashboard

TOTAL COMMENTS

3

PENDING APPROVAL

0

APPROVED

3

REJECTED

0

All Comments   ⧗ Pending (0)   √ Approved (3)   ✕ Rejected (0)

Future Implementation

In future versions, several enhancements can be integrated to improve system performance and scalability:

1. **User Registration & Role Management:** Extend roles beyond admin and author (e.g., editor, moderator).
2. **Media Library:** Add a file management system for storing images, videos, and documents.
3. **Post Scheduling:** Enable authors to set publishing dates for automated post releases.
4. **Email Notifications:** Notify users about new posts or comments via email.
5. **Analytics Dashboard:** Display real-time statistics for views, likes, and engagement trends.
6. **Search Optimization:** Introduce category, tag, and advanced keyword filters for faster content discovery.
7. **Cloud Integration:** Host images and files using cloud services for faster access and better scalability.

Conclusion

The developed **Content Management System** provides a complete, user-friendly, and secure platform for managing online blog content. It bridges the gap between content creators and readers by offering efficient post management, responsive design, and interactive features like commenting and reactions. Security features like password hashing, prepared statements, and session control ensure data protection and safe user operations. This CMS serves as a strong foundation for future web applications that prioritize both usability and security in digital content handling.

References

1. PHP Official Documentation – https://www.php.net/docs.php
2. MySQL Developer Guide – https://dev.mysql.com/doc/
3. W3Schools PHP and MySQL Tutorials – https://www.w3schools.com
4. **GITHUB REPOSITORY LINK→**

   PRATYUSHA MUKHERJEE→
   https://github.com/iampratyusha/BLOG_CMS_PHP_MYSQL

   HRITICK GHOSAL→ https://github.com/Hritick-Ghosal/BLOG_CMS