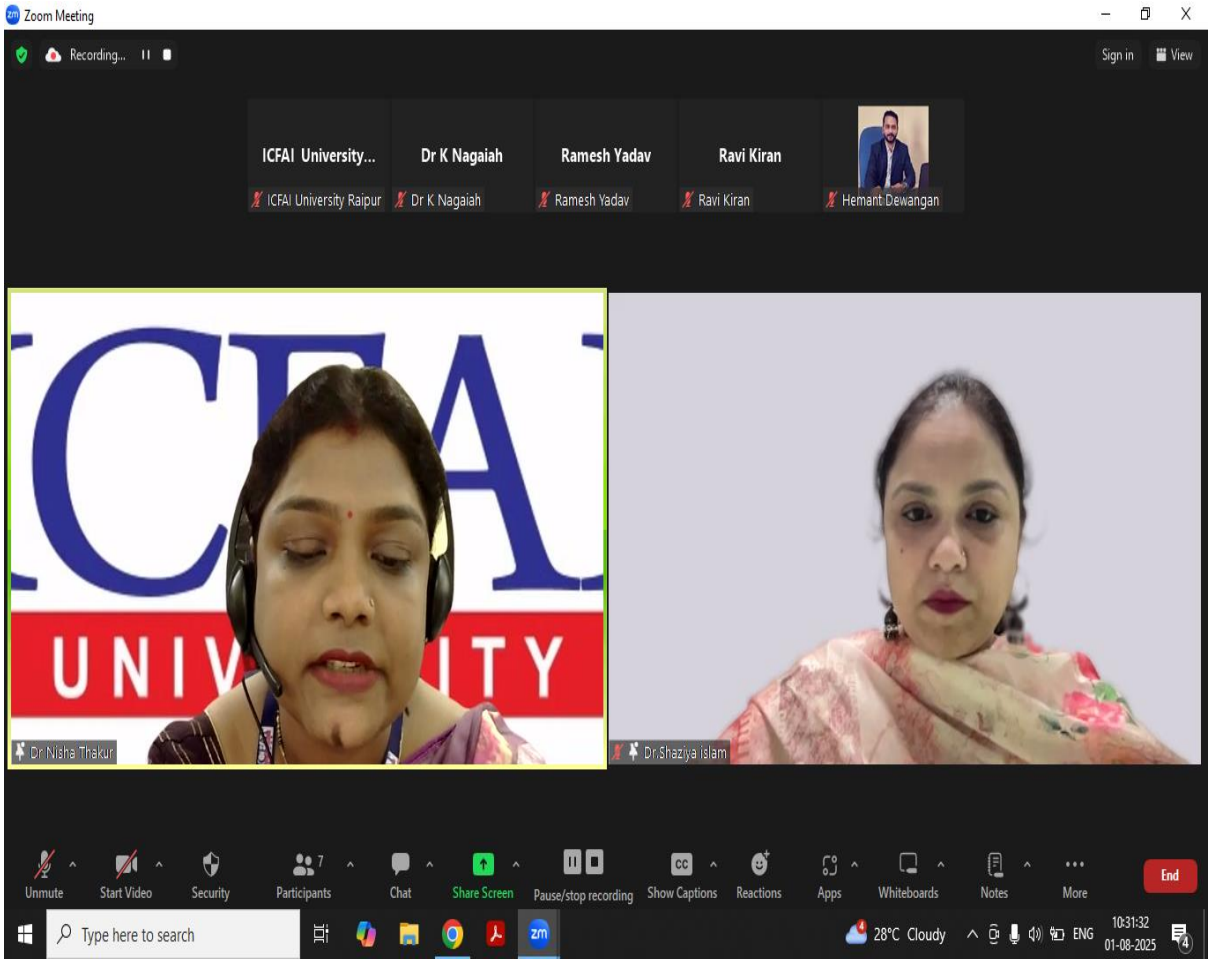
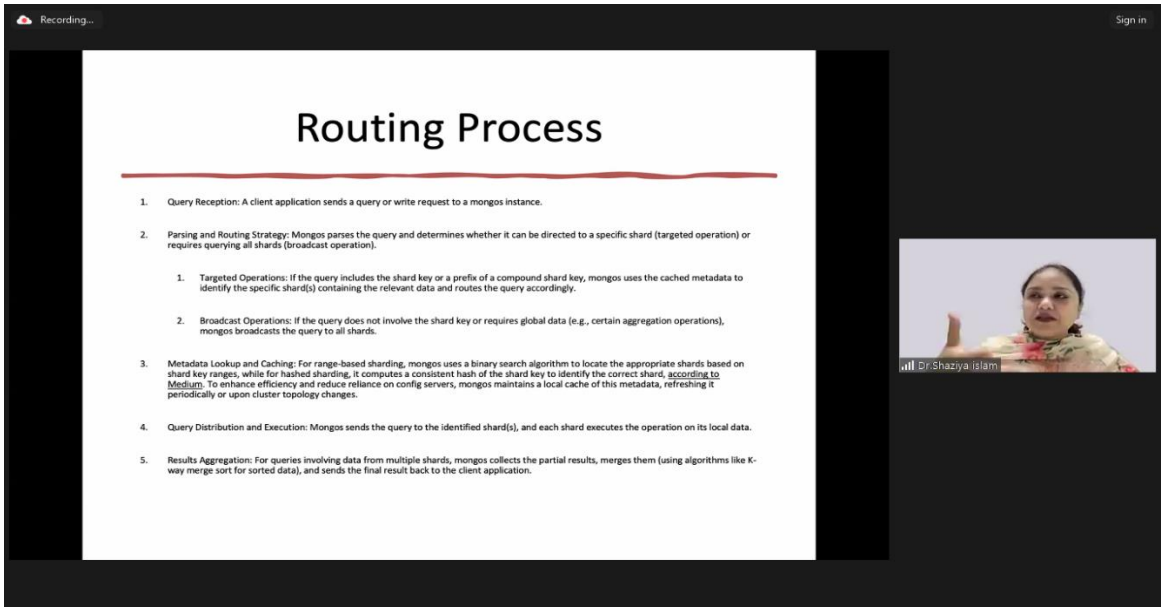
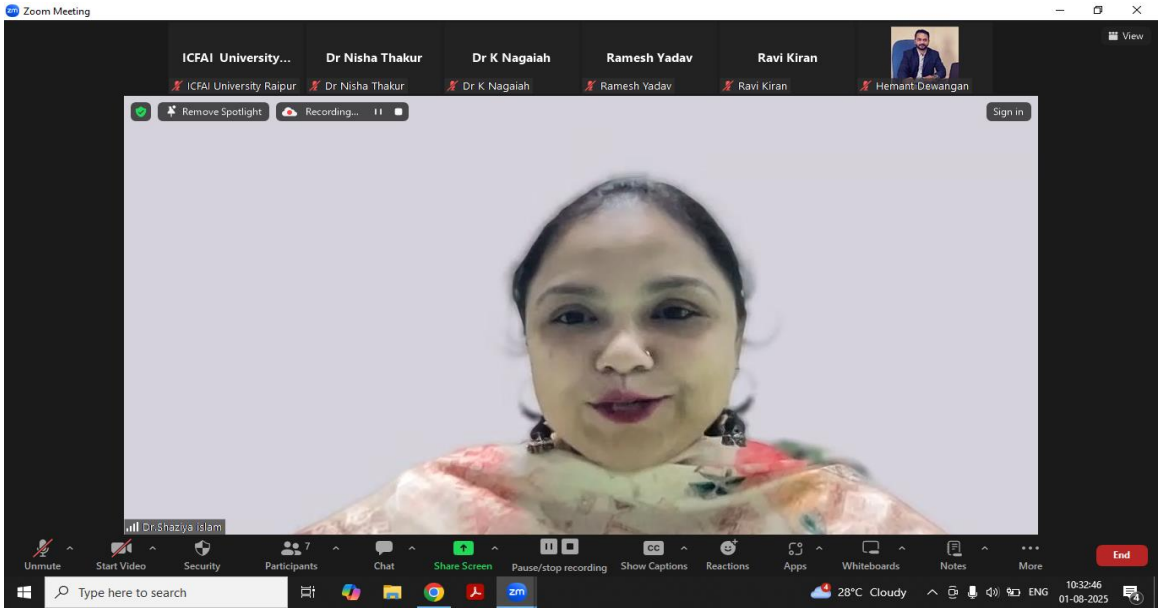
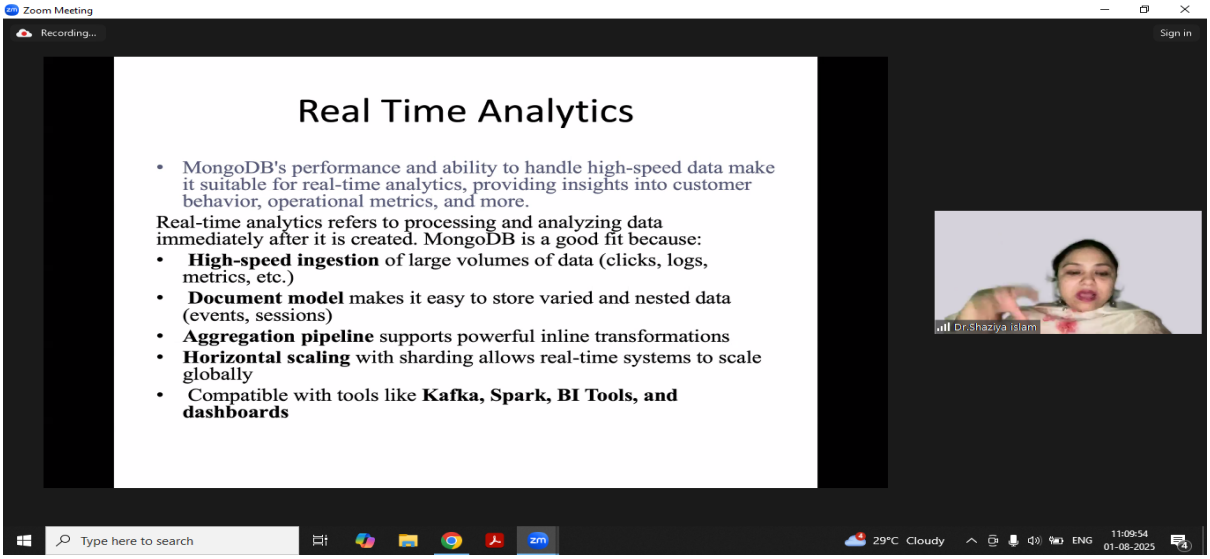
Report on: Day 2 Highlights – FDP Session on "Industrial Integration with MongoDB" by Dr. Shaziya Islam!!

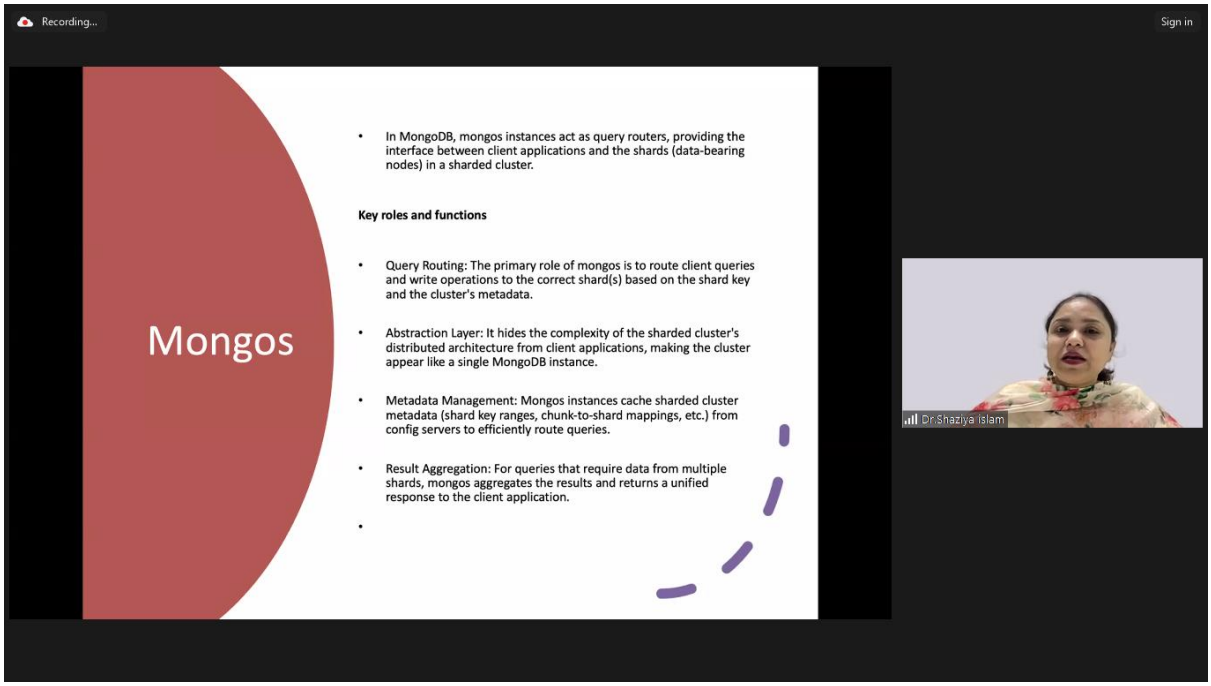
The Faculty Development Program held on August 1, 2025, featured an enlightening session on **"Industrial Integration with MongoDB" by Dr. Shaziya Islam,** Associate Professor, Dept. of CSE, Rungta International Skill University, Durg. Dr. Islam introduced MongoDB as a primary NoSQL database, emphasizing its core functions such as flexible document storage, horizontal scalability through sharding, high availability via replication, and efficient query processing. She explained how MongoDB serves as a powerful alternative to traditional relational databases, particularly in handling unstructured or semi-structured data. The session also highlighted MongoDB's integration across various domains including e-commerce platforms, gaming applications, and healthcare systems—demonstrating how it supports real-time analytics, dynamic content delivery, and user-centric data management. Dr. Islam's talk provided practical insights into real-world implementations, making it highly relevant for faculty members aiming to align academic knowledge with current industry demands.

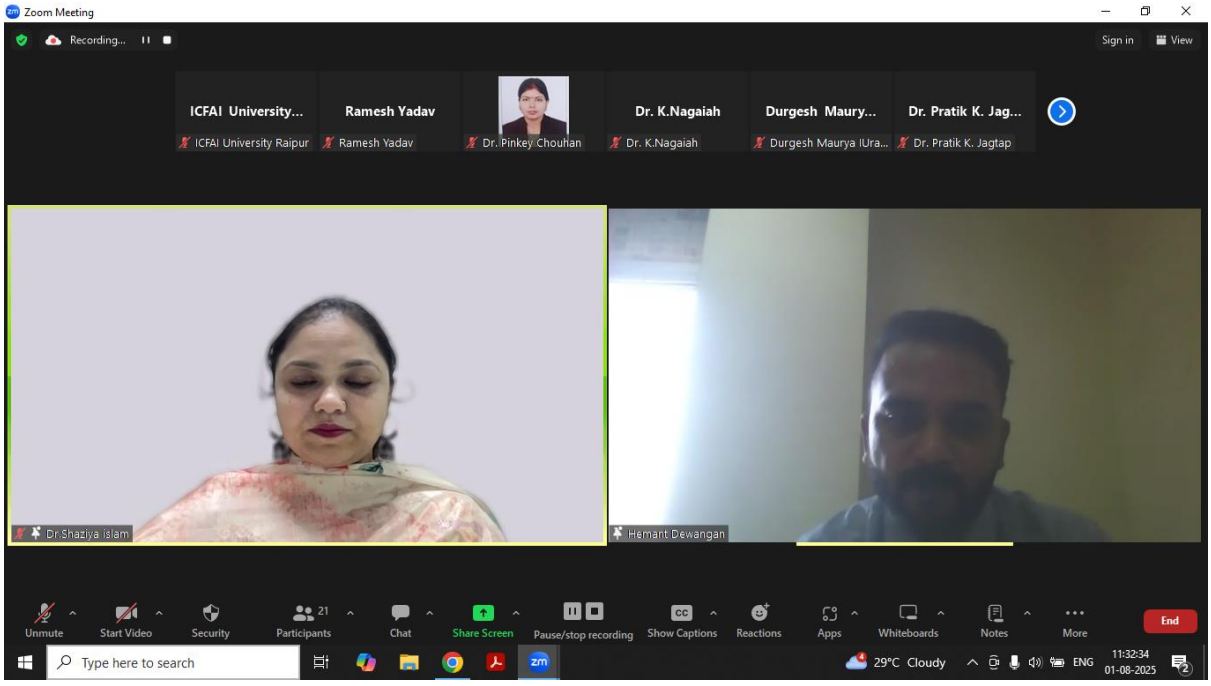



Recording...
Sign in
Routing Process
1. Query Reception: A client application sends a query or write request to a mongos instance.
2. Parsing and Routing Strategy: Mongos parses the query and determines whether it can be directed to a specific shard (targeted operation) or requires querying all shards (broadcast operation).
1. Targeted Operations: If the query includes the shard key or a prefix of a compound shard key, mongos uses the cached metadata to identify the specific shard(s) containing the relevant data and routes the query accordingly.
2. Broadcast Operations: If the query does not involve the shard key or requires global data (e.g., certain aggregation operations), mongos broadcasts the query to all shards.
3. Metadata Lookup and Caching: For range-based sharding, mongos uses a binary search algorithm to locate the appropriate shards based on shard key ranges, while for hashed sharding, it computes a consistent hash of the shard key to identify the correct shard, according to Medium. To enhance efficiency and reduce reliance on config servers, mongos maintains a local cache of this metadata, refreshing it periodically or upon cluster topology changes.
4. Query Distribution and Execution: Mongos sends the query to the identified shard(s), and each shard executes the operation on its local data.
5. Results Aggregation: For queries involving data from multiple shards, mongos collects the partial results, merges them (using algorithms like K-way merge sort for sorted data), and sends the final result back to the client application.
Dr.Shaziya Islam


Zoom Meeting
View
ICFAI University...
Dr Nisha Thakur
Dr K Nagaiah
Ramesh Yadav
Ravi Kiran
ICFAI University Raipur
Dr Nisha Thakur
Dr K Nagaiah
Ramesh Yadav
Ravi Kiran
Hemant Dewangan
Remove Spotlight
Recording...
Sign in
Dr.Shaziya Islam
Unmute
Start Video
Security
Participants
Chat
Share Screen
Pause/stop recording
Show Captions
Reactions
Apps
Whiteboards
Notes
More
End
Type here to search
28°C Cloudy
ENG
10:32:46
01-08-2025


Zoom Meeting
Recording...
Sign in
Real Time Analytics
• MongoDB's performance and ability to handle high-speed data make it suitable for real-time analytics, providing insights into customer behavior, operational metrics, and more.
Real-time analytics refers to processing and analyzing data immediately after it is created. MongoDB is a good fit because:
• High-speed ingestion of large volumes of data (clicks, logs, metrics, etc.)
• Document model makes it easy to store varied and nested data (events, sessions)
• Aggregation pipeline supports powerful inline transformations
• Horizontal scaling with sharding allows real-time systems to scale globally
• Compatible with tools like Kafka, Spark, BI Tools, and dashboards
Dr.Shaziya Islam
Type here to search
29°C Cloudy
ENG
11:09:54
01-08-2025


Recording...
Sign in
Mongos
In MongoDB, mongos instances act as query routers, providing the interface between client applications and the shards (data-bearing nodes) in a sharded cluster.
Key roles and functions
Query Routing: The primary role of mongos is to route client queries and write operations to the correct shard(s) based on the shard key and the cluster's metadata.
Abstraction Layer: It hides the complexity of the sharded cluster's distributed architecture from client applications, making the cluster appear like a single MongoDB instance.
Metadata Management: Mongos instances cache sharded cluster metadata (shard key ranges, chunk-to-shard mappings, etc.) from config servers to efficiently route queries.
Result Aggregation: For queries that require data from multiple shards, mongos aggregates the results and returns a unified response to the client application.
Dr.Shaziya Islam


Zoom Meeting
Recording...
Sign in
View
ICFAI University...
Ramesh Yadav
Dr. K.Nagaiah
Durgesh Maury...
Dr. Pratik K. Jag...
ICFAI University Raipur
Ramesh Yadav
Dr. Pinkey Chouhan
Dr. K.Nagaiah
Durgesh Maurya (Ura...
Dr. Pratik K. Jagtap
Dr.Shaziya Islam
Hemant Dewangan
Unmute
Start Video
Security
Participants
Chat
Share Screen
Pause/stop recording
Show Captions
Reactions
Apps
Whiteboards
Notes
More
End
Type here to search
29°C Cloudy
ENG
11:32:34
01-08-2025