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Forget SQL for a moment: Build Your First Database with MongoDB

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ABSTRACT

The webinar and workshop "Forget SQL for a moment: Build Your First Database with MongoDB," held on January 10, 2026, aims to provide knowledge about the NoSQL database service called MongoDB, with a focus on teaching how to install MongoDB, providing examples of terminal-based queries on Mongo Shell, and visualizing documents in the database using Mongo Compass. Additionally, participants learned how to install the MongoDB database server, access the database via the Mongo Shell terminal, and use Mongo Compass as a Graphical User Interface (GUI) to easily view document visualizations in each database collection. This event successfully attracted 35 student participants from the same department across all grades. This enthusiasm was also supported by the relevance of the course and the participants' interest in learning about the MongoDB database. The results of the pre-test, which participants took before the material was discussed, had an average score of 60.21 points and a median of 90 points, while the post-test, which participants took after the material was discussed in the webinar and workshop, had an average score of 71.88 points and a median of 100 points. In addition, participants provided mostly positive feedback, expressing enthusiasm and satisfaction with the event, as well as suggestions for improvement in the future. This activity served as a means of technological education that provided insight and supported the development of science and technology.

Webinar dan Workshop "Lupakan SQL sejenak: Bangun Database Pertama dengan MongoDB", yang diselenggarakan pada tanggal 10 Januari 2026, bertujuan memberikan pengetahuan tentang layanan noSQL Database bernama MongoDB dengan fokus mengajarkan cara instalasi MongoDB, memberikan contoh penggunaan Query berbasis terminal pada Mongo Shell hingga visualisasi dokumen pada database menggunakan Mongo compass. Kemudian diajarkan juga tentang cara pemasangan server database MongoDB, mengakses database melalui terminal Mongo Shell dan menggunakan Mongo compass sebagai Graphical User Interface (GUI) yang memudahkan pengguna dalam melihat visualisasi dokumen pada collection di setiap database. Acara ini berhasil menarik 35 peserta mahasiswa dari Jurusan yang sama di semua angkatan, antusiasme ini juga didukung oleh kesesuaian mata kuliah dan peserta yang tertarik untuk belajar mengenai database Mongodb. Hasil dari Pre-test yang dimana peserta mengerjakan tes

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tersebut sebelum pembahasan materi memiliki nilai rata rata sebanyak 60,21 poin dan median 90 poin, sedangkan di Post-Test, yang dimana peserta mengerjakan tes tersebut setelah pembahasan materi pada webinar dan workshop, memiliki rata rata sebanyak 71,88 poin dan median sebanyak 100 poin. Selain peserta juga memberikan feedback yang mayoritas positif, menyatakan antusiasme dan kepuasan pada acara ini serta masukan dan saran agar lebih baik di kemudian hari. Kegiatan ini menjadi sarana edukasi teknologi yang memberikan wawasan dan juga mendukung perkembangan ilmu pengetahuan dan teknologi.

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A. INTRODUCTION

The rapid advancement of information and communication technology has significantly improved the way people access information. Previously, obtaining information was often difficult and time-consuming; however, it has now become faster and more efficient with the support of various systems and technologies. Technological innovations have also enabled the development of systems in which data can be created, stored, managed, and deleted efficiently. One of the fundamental systems supporting this process is a database, which is a structured collection of interconnected data stored in a specific medium to facilitate efficient data management and retrieval (Syahputri & Nasution, 2023).

Databases can generally be categorized into SQL, commonly known as Relational Database Management Systems (RDBMS), and NoSQL databases. SQL databases use structured tables and predefined schemas, while NoSQL databases offer more flexible data models and do not rely on tabular structures. Examples of SQL databases include MySQL, whereas MongoDB is a widely used NoSQL database, each offering distinct advantages. SQL databases provide robust security features, such as role-based access control, encryption, and user activity logging (Muzaffar ugli, 2025). These features make SQL an ideal choice for applications handling sensitive data. In terms of performance, according to research by (Saputra et al., 2025), which compared the performance of MySQL and MongoDB by testing large-scale data using CRUD (Create, Read, Update, Delete), it was concluded that both databases experienced an increase in execution time, but MongoDB still had the lowest execution time (Muhamad et al., 2025).

Several studies have emphasized that NoSQL databases emerged as an alternative to relational databases to address challenges related to scalability, schema flexibility, and the management of unstructured data. (Al Maamar & Nasar, 2025) explain that NoSQL supports flexible data modeling to handle dynamic and evolving data structures. This allows organizations to adapt to changes in data models and extract value from diverse data sources, which aligns with the need for horizontal scalability and high throughput in modern applications. Furthermore, (Ying et al., 2025) assert that SQL excels in data integrity and complex queries, while NoSQL is better in scalability and flexibility. The results of scenario

analysis in the study confirm the contextual suitability of each model, so the type of database should be selected according to the context and application requirements.

MongoDB is a document-based NoSQL database that stores data in JSON (JavaScript Object Notation) format (Syahwali & Sutabri, 2025). As mentioned earlier, NoSQL databases do not use tables. Database services such as MongoDB store data in JSON document format. The terms used are also different, such as tables in MongoDB being referred to as collections, which store data in the form of JavaScript-based documents. This document-based database is also known for its flexibility; users do not need to write functions like SQL to create a new database. Users only need to use the "use" command followed by the name of the database to be created. The database will be recorded when the user creates a collection. If a collection contains a document with data in it and the user wants to add data with new attributes, the user does not need to define a table name as in an SQL database. Users can create documents with attributes that differ from other documents, although it is generally recommended to standardize all attributes with existing data.

The role of databases in industrial needs, especially in the IT field, is crucial, particularly in data management within applications and companies. Considering that databases are a competency that students must possess to pursue a career in technology, especially in information systems, databases are often closely associated with SQL (Rouf & Marasabessy, 2024). Educational initiatives such as webinars and workshops are conducted to introduce new concepts of NoSQL document-based databases. One example is the program "Forget SQL for a Moment: Build Your First Database with MongoDB," held on January 10, 2026. The event included a webinar attended by 35 participants, which discussed database fundamentals, an introduction to MongoDB, its key characteristics, examples of embedded documents, basic MongoDB operators, comparisons with SQL, MongoDB limitations, and appropriate use cases. The workshop session covered practical steps such as running the MongoDB server, activating the Mongo Shell, using MongoDB Compass as a graphical user interface, creating databases and collections, inserting documents, and executing queries. By integrating theory and practice, this program aims to provide a foundational understanding for students on how to use MongoDB effectively in application development within the field of information systems in the digital technology era.

B. METHODS

This study applied a quantitative descriptive approach to evaluate the effectiveness of the community service program. The implementation was conducted through several systematic stages, including socialization, material preparation, training implementation, and evaluation. The socialization stage aimed to disseminate information and recruit participants through online platforms, while the preparation stage focused on developing instructional materials in the form of presentation slides and practical guidelines to support the learning process.

Data collection was carried out using a pre-test administered prior to the training to measure participants' initial understanding of database concepts. The intervention phase consisted of a webinar session that introduced fundamental database concepts and MongoDB, followed by a hands-on workshop designed to provide practical experience. During the workshop, participants were guided through activities such as installing MongoDB, using the Mongo shell, accessing MongoDB Compass, and executing basic commands and queries.

After the training sessions, a post-test and feedback questionnaire were administered to evaluate participants' understanding and satisfaction. The pre-test and post-test results were analyzed using descriptive statistical methods to determine the level of knowledge

improvement, while the feedback responses were used to assess the overall effectiveness of the program and provide recommendations for future improvements.

C. RESULTS AND DISCUSSION

This event was held on Saturday, January 10, 2026, from 8:00 a.m. to 11:20 a.m. Western Indonesian Time, with the aim of providing knowledge and insight into the NoSQL database MongoDB. The activity was conducted online via Zoom Meeting and implemented in a structured and sequential manner to ensure smooth execution. The event began with a preparation session involving all committee members, followed by the opening session and welcoming remarks from the organizing committee. This was continued by the national anthem, after which participants completed a pre-test to assess their initial understanding of database concepts.

The main webinar session was then delivered, focusing on database fundamentals and an introduction to MongoDB, followed by a short break. Subsequently, a workshop session was conducted, during which participants engaged in hands-on practice, including MongoDB installation, basic commands, database and collection creation, document insertion, and query execution. The activity concluded with a post-test session to evaluate participants' learning outcomes, followed by the official closing of the event.

1.1.1. Stage 1 (Activity socialization)

In this stage, the author and the team conducted socialization activities to the community through social media to attract potential participants by distributing posters that had been made, as shown in Figure 1 below.

Figure 1. Flyer activity

1.1.2 Stage 2 (Preparation of Activity Material)

At this stage, the webinar presenter prepares the material to be delivered. The webinar presenter will use PPT to facilitate the presentation. The material presented is an introduction

to databases in general and NoSQL MongoDB databases in theory. The material covers several points, including:

a. Introduction to databases in general
b. Introduction to the MongoDB database
c. Key characteristics of MongoDB
d. Examples of embedding in documents in the MongoDB database
e. Comparison with SQL commands
f. Basic MongoDB operators
g. Disadvantages of MongoDB
h. When to use MongoDB

The material is organized so that at the beginning of the activity, the audience can gain a general understanding of databases and also get an overview of what MongoDB is before the workshop begins.

1.1.3 Stage 3 (Pre-Test session)

Before the webinar begins, participants are asked to complete a short pre-test quiz to gauge their general understanding of databases so far.

Table 2 Percentage of the Pre-Test right choice

No	Question	Answer	Correct Answer Precentage
1	In simple terms, what is meant by "Database"?	B. A place to store data/information organized on a computer	97.10%
2	Which of the following is an example of a "Database" in everyday life?	A. Your phone's contact list	88.60%
3	If we store data in a database, what is the main advantage compared to writing on paper?	A. Data is easier to search, edit, and store in large quantities	100%
4	In a database, one piece of information (e.g., Name: Budi, Age: 20) is usually called...	B. Data (or Document)	94,30%
5	In MongoDB, one piece of data (e.g., data for one user) is stored in the form of...	B. Document (like a note file)	80%
6	What is the main reason someone uses a computer database instead of noting on paper?	B. So data can be searched in seconds even if there are thousands of entries	88,20%
7	In a digital database, one complete information package (e.g., Name, Address, and Phone Number for one person) is called a...	A. Document or Record	100%

8	The place to collect many similar data (e.g., all student data in one school) is called...	C. Collection or Table	62,90%
9	Relational databases usually store data in the form of…	C. Table	60%
10	In MongoDB, data is stored in the form of…	C. Document (JSON/BSON)	74,30%

The data table above shows that participants had sufficient knowledge prior to attending the webinar, with an average score of approximately 84.29%. Based on the average percentage of correct answers, approximately 15.7% of participants answered incorrectly. The distribution of points for each participant is shown in the following figure:

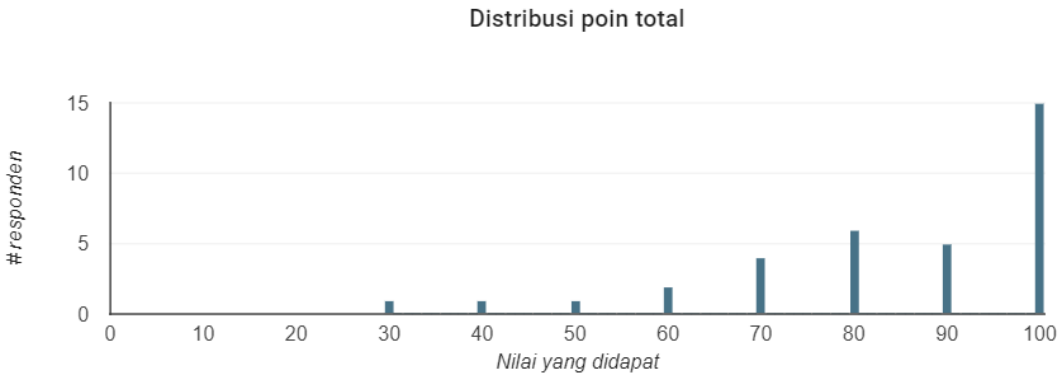

Figure 2 Pre-Test distributional point

In the Figure 2 above, it can be seen that 15 out of 35 respondents were able to answer the Pre-Test quiz correctly, and only 1 person had the lowest score out of all respondents who took the test.

1.1.4 Stage 4 (Webinar session)

This webinar began with an introduction to the basic concept of a database as a collection of interrelated data stored on hardware and manipulated with software. The presenter emphasized the importance of databases in information systems as providers of information for users (Riawati et al., 2022). After that, the material continued with an introduction to MongoDB as an open source document-based database with BSON format. MongoDB is classified as a NoSQL database because it is able to overcome the limitations of relational systems in handling large-scale and distributed data (Haerullah, 2025). Its main characteristics include schema flexibility, horizontal scalability, high performance, and high availability support through the sharding feature (Sowandi et al., 2023). Next, the presenter explained an example of embedding, which allows documents to store other documents along with additional attributes so that data access is faster without query joins. A comparison of CRUD commands between SQL and MongoDB was also presented to clarify the differences in syntax. Basic MongoDB operators that use the $ prefix were demonstrated with several

practical implementations. In addition to discussing the advantages, the presenter also outlined the disadvantages of MongoDB so that participants could understand its limitations. The webinar concluded with an explanation of the context of MongoDB usage, namely in applications that require schema flexibility, high scalability, and fast performance in managing large and distributed data.

1.1. 5 Stage 5 (Workshop session)

During the workshop session, the presenter provided a GitHub link containing step-by-step instructions for participants to follow, ranging from installing MongoDB, introducing basic functions, creating documents, to using queries. Participants were instructed to install MongoDB locally, run the server through the terminal, and install Mongo Shell as a command line interface. To facilitate visualization, participants were also introduced to Mongo Compass as a GUI, which was then used to connect to the server and display the database graphically. After that, the instructor explains basic commands such as show databases and use to create or switch databases. The next step is an introduction to basic MongoDB functions through database methods, collection methods, and document methods. Participants are invited to create collections such as customers, menu_makan, and orders, then fill in documents with the insertOne and insertMany commands. The instructor also demonstrates embedding data in a single document to show the flexibility of MongoDB. After that, participants learned basic queries such as find() for data search, the use of comparison operators, logic, and elements, as well as data manipulation queries such as updateOne, updateMany, replaceOne, deleteOne, and deleteMany. With this hands-on practice, participants not only understood the theory but were also able to operate MongoDB in real life for data management needs.

1.1.6 Stage 6 (Post-Test session)

After the workshop session, participants were asked to complete a post-test quiz as part of the requirements for obtaining a certificate and to measure their understanding of the workshop material presented. They were also asked to provide feedback for the evaluation of the committee members who had carried out this activity.

Table 3 Percentage of the Post-Test right choice

No	Question	Answer	Correct Answer Percentage
1	What type of database is MongoDB?	C. NoSQL Database	71,40%
2	The main data storage format in MongoDB is…	C. JSON / BSON	85,70%
3	The term MongoDB uses instead of "table" is…	C. Collection	69%
4	The command to display all data in a collection is…	C. db.collection.find()	54,30%
5	The command to add one data entry to a collection is…	B. db.collection.insertOne()	74%

6	The _id field in MongoDB serves to…	C. Identify unique data	80,00%
7	MongoDB is suitable for applications that…	B. Require data structur flexibility	80%
8	How to create a new collection in MongoDB?	C. db.createCollection("nama collection")	82,90%
9	Which statement about MongoDB is correct?	D. Data is stored in document form	74%
10	MongoDB uses commands based on…	C. JavaScript Object	71,40%

Based on the data table above, it shows that the average percentage of post-test results from 35 participants who attended the workshop session was 74.29%. Judging from the average percentage of correct answers, there were around 25.71% of participants who answered incorrectly. The distribution of points for each participant is shown in the following figure:

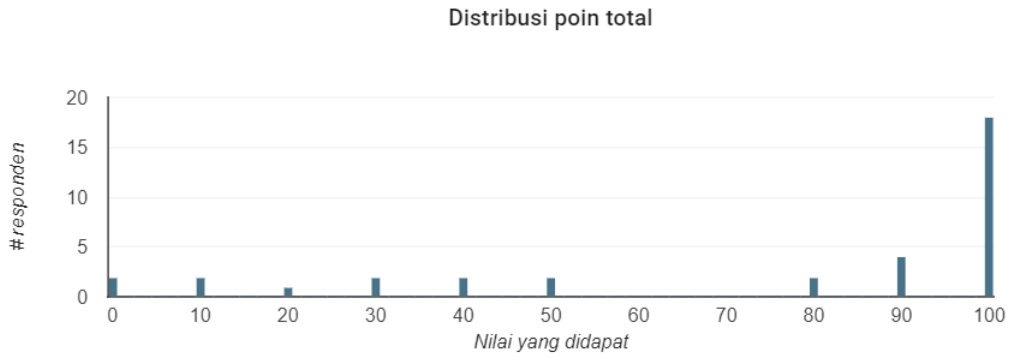

Figure 3. Post-Test total distributional point

Based on Figure 3, the distribution of points obtained by participants after attending the workshop session increased beyond the pre-test, which was only 15 people. Although the average pre-test results were superior to the post-test, the distribution of points showed that the post-test exceeded the pre-test. This was also because the questions given in the post-test were more difficult than the pre-test, which only contained general questions about databases.

Before the event ended, participants were asked to fill out a feedback form for the webinar and workshop organizing committee to evaluate. Respondents' satisfaction was measured on a scale of 1 to 5 with the following questions:

1) How beneficial was the learning material presented?
2) Is the material delivered in this webinar and workshop suitable for your needs as a beginner learning your first database development?
3) How easy was it to understand the learning material?

4) Did the presenter explain the material well and answer questions effectively?
5) How satisfied are you overall with the webinar & workshop session?
6) How was the access to information (registration, form filling, audio, network connection, and feedback)?

Table 4 Percentage of satisfaction feedback

Satisfaction Rating	umber of Respondents	Persentase	Interpretasi
5 Stars (Very Satisfied)	21	60.00%	Majority felt very satisfied.
4 Stars (Satisfied)	13	37.14%	One-third felt satisfied with the material.
3 Stars (Adequate)	1	2.86%	Only a small portion felt neutral.
2 & 1 Stars	0	0%	No respondents felt dissatisfied.

Looking at the data in Table 4, the percentage of respondent feedback based on the data is quite good, reaching 60% of the 21 participants who said they were very satisfied. Overall, this webinar and workshop received positive responses and enthusiasm from the participants. However, there are several important evaluation points based on the suggestions given by the participants. Examples of some of these suggestions are:
-The provision of a tutorial on setting up MongoDB before the activity
-Increasing the volume and audio of the speakers
-The content and material could be explored in greater depth

These points will be used as evaluation material by the committee in organizing academic events such as webinars and workshops like this one.

D. CONCLUSION

The results of the Webinar and Workshop "Forget SQL for a moment: Build Your First Database with MongoDB," held on January 10, 2026, via Zoom Meeting (08:00 - 11:20 WIB), can be concluded that the event achieved its objectives and ran smoothly. The event successfully attracted approximately 35 participants from various institutions involved in learning about the NoSQL MongoDB database. A comparison of Pre-Test and Post-Test scores showed a significant difference. The Pre-Test had an average of 84.29% (median: 90) and the Post-Test had an average of 74.29% (median: 100), but the distribution of points on the Post-Test increased compared to the Pre-Test. This was also used as evaluation material because the Pre-Test had different questions from the Post-Test. Participant feedback also expressed enthusiasm, with the majority feeling very satisfied with the benefits, delivery, and information provided by the presenter. Overall, these results confirm the effectiveness of the webinar-workshop in enhancing participants' knowledge and engagement.

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F. AUTHOR CONTRIBUTIONS

Activity implementation: DSR, KRA, MFDS, NGYN, NSADA; Preparation of materials & coordination: DSR, KRA; Participant registration & technical preparation: MFDS; Article preparation: KRA; Presentation of results: DSR, KRA; Supervising lecturer: PM, Article revision: RM; Other contributions (Facilitator): RM, YA.

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