DATABASE ADMINISTRATOR (DBA) ROLES & RESPONSIBILITIES IN THE BIG DATA AGE

Back in 2017 when [The Economist](#) famously declared "Data is the new oil!", they were simply stating the obvious that today's most valuable companies are the ones that make the most of the data in their possession—whether willingly given or not.

Data is the lifeblood of any organization, and the [management of data](#) in IT systems remains a critical exercise, particularly in a time where data privacy regulation is a hot topic.

In this context, the role of the Database Administrator (DBA) has likely evolved over time, given the [evolution of data sources](#), types, and storage options. Let's review the current status and see what the future holds for DBAs.

What is a DBA?

Short for database administrator, a DBA designs, implements, administers, and monitors data management systems and ensures design, consistency, quality, and security.

According to SFIA 8, database administration involves the installing, configuring, monitoring, maintaining, and improving the performance of databases and data stores. While design of databases would be part of solution architecture, the implementation and maintenance of development and production database environments would be the work of the DBA.

(Read our data architecture explainer.)

What does a DBA do?

The day-to-day activities that a DBA performs as outlined in ITIL® Service Operation include:

- Creating and maintaining database standards and policies
- Supporting database design, creation, and testing activities
- Managing the database availability and performance, including incident and problem management
- Administering database objects to achieve optimum utilization
- Defining and implementing event triggers that will alert on potential database performance or integrity issues
- Performing database housekeeping, such as tuning, indexing, etc.
- Monitoring usage, transaction volumes, response times, concurrency levels, etc.
- Identifying reporting, and managing database security issues, audit trails, and forensics
- Designing database backup, archiving, and storage strategy

What competencies does a DBA require?

At a bare minimum, the DBA will:

- Have an IT, computer science, or engineering educational background
- Need to be conversant with structured query language (SQL) and relevant database technologies (whether proprietary or open source)
- Understand coding and service management (to some degree)

Relevant database technologies include SQL Server, MySQL, Oracle, IBM Db2, and MongoDB, among others. Now, this doesn't mean you have to be certified in all of them, but a working knowledge of a few of them is required.

The European e-Competence framework (e-CF) outlines five associated competencies that the DBA should have. These competences are all proficiency level 3 (on a scale of 1 to 5):

e-CF Area	e-CF Competence	Level 3
Build	Application Development	Acts creatively to develop applications and to select appropriate technical options. Accounts for others development activities. Optimizes application development, maintenance and performance by employing design patterns and by reusing proved solutions.
	Component integration	Accounts for own and others' actions in the integration process. Complies with appropriate standards and change control procedures to maintain integrity of the overall system functionality and reliability.
Run	Change Support	Ensures the integrity of the system by controlling the application of functional updates, software or hardware additions and maintenance activities. Complies with budget requirements.
	Information and Knowledge Management	Analyses business processes and associated information requirements and provides the most appropriate information structure.

Manage	Information Security Management	Evaluates security management measures and indicators and decides if compliant to information security policy. Investigates and instigates remedial measures to address any security breaches.

A cursory search across popular talent recruiting websites indicates additional soft skills needed by DBAs include:

- Business awareness and understanding of business requirements of IT
- Excellent problem-solving and analytical skills
- Good communication, teamwork, and negotiation skills
- Good organizational skills
- Flexibility and adaptability
- Excellent business relationship and user support skills

DBA career development

SFIA 8 defines four levels of responsibility for the DBA which you can map to your career development roadmap:

Level 2 (Assist)

- Assists in database support activities

Level 3 (Apply)

- Performs standard database maintenance and administration tasks
- Uses database management system software and tools to collect performance statistics

Level 4 (Enable)

- Develops and configures tools to enable automation of database administration tasks
- Monitors performance statistics and create reports
- Identifies and investigates complex problems and issues and recommends corrective actions
- Performs routine configuration, installation, and reconfiguration of database and related products

Level 5 (Ensure, Advise)

- Identifies, evaluates, and manages the adoption of database administration tools and processes, including automation
- Develops and maintains procedures and documentation for databases. Contributes to the setting of standards for definition, security, and integrity of database objects and ensures conformance to these standards
- Manages database configuration including installing and upgrading software and maintaining relevant documentation
- Monitors database activity and resource usage. Optimizes database performance and plans for

forecast resource needs

Outlook for DBAs

The DBA role is here to stay when it comes to data administration, but it is clear that the name might need some tweaking.

The digital age has resulted in the huge growth in unstructured data such as text, images, sensor information, audio, and videos, on account of e-commerce, IoT, AI and social media. As a result, the job title 'database administrator' seems to be giving way to 'data administrator', to cater for management of both [structured (database) and unstructured (big data) data sets](#).

Since most digital organizations are no longer restricted to transactional data only, the modern day DBA must be conversant with file, block and object storage solutions.

And because of the sheer volume of data, as well as the ability to access [AI/machine learning solutions](#) to digest such data, the preferred data storage mode for most digital organizations is cloud based. Therefore, the modern DBA must become fully conversant with [cloud architectures](#) and technologies, including data lakes and big data solutions like [Hadoop](#).

The rise of DevOps as the preferred model for end-to-end product management means that the

DBA must become a comb-shaped specialist, working in an [autonomous environment](#) with platform engineers to develop automated self-service tools that software developers can utilize to create the data solutions they require for their applications.

This means the DBA will need to build software engineering capabilities as part of their repertoire.

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DBAs must acknowledge data privacy

Data protection regulation has become a key focus area for enterprises around the world. The stringent requirements and hefty fines have resulted in scrutiny of data management becoming a critical corporate governance imperative.

The DBA must become conversant with data protection regulation such as [GDPR](#), and how to implement the relevant security controls to ensure [user/customer privacy rights](#) are respected in business operations.

Related reading

- [BMC Machine Learning & Big Data Blog](#)
- [Top DBA Shell Scripts for Monitoring the Database](#)
- [What Is a Database Reliability Engineer (DBRE)?](#)
- [DataOps Explained: Understand how DataOps leverages analytics to drive actionable business insights](#)
- [Are IBM® z/OS® Db2® DBAs Vanishing?](#)
- [Today's Best IT/Tech Certifications: A Complete Guide](#)