

JOB DESCRIPTION

TITLE OF POSITION: Senior Database Analyst/ Database Administrator

POSITION #: IT-127

GROUP/UNIT: IT Digital Innovation and Development

REPORTS TO: Manager, IT Digital Innovation and Development

PRIMARY PURPOSE

Through its services and products, CCOHS advances health and safety in Canadian workplaces, and the physical and mental well-being of Canadians.

The IT Digital Innovation and Development Service Unit provides computer and information technology support to CCOHS products, services and operations under an integrated Information Technology (IT) strategy, incorporating the most appropriate IT infrastructure tools and processes to support mission-critical functions. The IT Digital Innovation and Development Service Unit is responsible for the analysis, design and development of computer system products including web and mobile applications; the production and delivery of information products; the design, development and maintenance of databases; the development and management of CCOHS products and services including the CCOHS website, as well as websites and mobile apps for partner organizations; and the management and delivery of projects assigned to the unit.

The incumbent analyzes the requirements related to data, translates data requirements into functional database systems based on CCOHS data strategy and industry best practices. The incumbent will make joint decisions on data collection, data storage, data flow design, database design and database implementation. The incumbent will also work with other database administrators to review existing database and data structures, and make recommendations on database design, data processes and data integration, as appropriate. Performing daily database administration including user management, access control, data backup and recovery is another major responsibility of this position.

	<u>DUTIES</u>	<u>% OF TIME</u>
1.	<u>Data Strategy Implementation and Database Systems Design</u> 1. Research industry best practices and ensure compliance with Federal Government data strategies directives and policies to assist in the implementation of CCOHS data strategy, policies, and processes. 2. Collect and analyze information regarding data storage, process, and management in new projects and / or application development process and translate the data-related business requirements into functional database design. 3. Follow CCOHS data strategy and leverage modern tools, technologies, industry standards and best practices to build high performance databases.	35%
2.	<u>Database Administration</u> 1. Analyze existing database systems and data structures to recommend alternative solutions or improvements. 2. Conduct database administration functions which include user management, database monitoring, troubleshooting, database tuning, query optimization, database backup and recovery, as well as database systems updates, upgrades, and migration. 3. Review changes to databases made by other team members, as well as the code developed by development teams to communicate with databases and make recommendations to ensure data security, data integrity, privacy, database performance and scalability.	35%
3.	<u>Data Integration and Database Application Development</u> 1. Work with development teams to build database access application programming interfaces (APIs) or modules to integrate multiple data sources through web services. 2. Build and maintain database stored procedures, triggers, and functions as needed to support development projects and reports.	25%

4.	<u>Other</u> Participate in project teams to meet targets and deliverables assigned to the teams; document procedures and processes as required; provide training on database development best practices and data structures; perform other related duties, as required.	5%
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NATURE AND SCOPE OF POSITION

The incumbent reports to the Manager, IT Digital Innovation and Development Service Unit, and is a member of a team responsible for building or implementing Information Technology solutions, including web applications/tools and mobile apps to support CCOHS products and services, such as the CCOHS website, as well as tools and mobile apps for external clients.

The incumbent conducts research on federal government data strategy, policies, and industry best practices to help develop, implement and evolve CCOHS' data strategy and policies. The incumbent communicates with business stakeholders and the development team to ensure that the information systems architecture, data collection and data flow follow CCOHS' data strategy, privacy policy, security standards and industry best practices.

The incumbent works closely with project and development teams to analyze the requirements for data collection, storage, and reporting; and to design, build or improve high performance, scalable, and high availability database systems, leveraging tools and technologies based on user and systems requirements. The incumbent ensures that data architecture changes made to the CCOHS environment support the enterprise architecture strategy and function within an integrated CCOHS data ecosystem.

The incumbent is responsible for reviewing existing database systems and data structures across CCOHS IT infrastructure, identifies the areas that need to be retired, upgraded, updated, or redesigned, and provides recommendations on alternative solutions or directions on future improvements, as appropriate and needed, based on CCOHS data strategy and industry best practices.

The incumbent is responsible for the daily database administration on CCOHS database systems, which includes user management, database security, performance monitoring, troubleshooting, database tuning, query optimization, backup and recovery, as well as database systems updates, upgrades and migration etc. The incumbent also supports both the Development and Operations teams in building / maintaining stored procedures, triggers, functions, and APIs to enable data access and integration, as needed.

KNOW-HOW

- Requires advanced knowledge of data management and best practices regarding data governance, data integrity, data security, database operations, and data warehousing. It also requires good understanding of federal government data strategy, data privacy and security policies.

- Requires thorough comprehension of highly scalable database architecture and extensive experience in implementing database replication, database caching, as well as integrating multiple data sources into one centralized database platform or system.
- Requires an advanced understanding of the business logic and data flows of CCOHS websites, mobile apps, products and services, as well as database management system (DBMS) architecture, data modeling, database technology trends and best practices.
- Must be proficient in designing, installing, and managing relational database management systems (RDBMS) such as MySQL and MS SQL Server; extensive working experience in database administration including user management, data access management, performance monitoring and tuning; troubleshooting, database backup and recovery; database upgrade and migration; and database replication and scaling. Hands-on experience in writing and performance-tuning SQL, Stored Procedures, triggers and functions is required.
- Must have solid comprehension of database technologies, trends and best practices and broad knowledge of database systems and data solutions, such as RDBMS, NoSQL databases, Data Warehouse and Data Lake, in order to recommend solutions or directions on CCOHS data storage and data structure.
- Requires advanced knowledge in cloud computing and database solutions, such as AWS EC2 and RDS. Knowledge of Business Intelligence (BI) tools is required.
- Requires intermediate knowledge of Software Development Life Cycle and best practices, and working experience in building database access functions/modules/APIs using programming languages such as PHP, Javascript/NodeJS, C# or Python etc.
- Must have excellent analytical skills to understand business requirements involving data collection, storage and processes, as well as the overall objectives of the products or services, and translate these into practical solutions leveraging various database solutions.
- Requires excellent communication skills to communicate with internal and external clients; lead the discussions related to CCOHS data strategy to build consensus around all major decisions regarding data collection, data storage, data flow, data structures, and reports; and coordinates with development and project teams to provide guidance on data-related issues in the full SDLC cycle.
- Requires knowledge of ITIL and best practice change management.

PROBLEM-SOLVING

- Investigates and troubleshoots problems or issues with databases or database-driven applications, usually across multiple platforms and under pressure. Solving data or database systems problems usually requires excellent analytical skills and great patience.
- Considers response time, database performance, data privacy policy, data security, database scalability and ease of maintenance in designing or updating database

structures and data models. Monitors database systems and troubleshoots any issues related to databases. Failure in addressing potential problems such as data privacy, or risks such as data security, could have a huge impact on organization goals and activities.

- Reviews database related code, such as SQL queries, stored procedures, functions, and APIs, through the Software Development Life Cycle (SDLC) with all different scenarios considered usually across multiple platforms or technologies, such as on cloud platform, on-premises environment, and mobile devices, to recommend changes to address any potential security or performance issues.
- Reviews and evaluates CCOHS existing data structures, database systems and data processes, and makes recommendations based on CCOHS data strategy to improve or replace existing data structures, to address potential issues and mitigate the risks.
- Leads data-related discussions and decision-making to ensure implementation, model and structures are aligning with CCOHS data strategy and best practices; analyzes and interprets business requirements, and researches and recommends best solutions using constructive thinking in database design to ensure best practices are followed and clients' requirements are met.
- Monitors and investigates trends, technologies, and best practices in database management and development, recommends best database solutions to help ensure CCOHS is innovating and continuously improving in this area.

ACCOUNTABILITY

The position is accountable for:

- Recommending directions or solutions to assist with developing and implementing CCOHS data strategy and policies; defining data models and structures based on business requirements.
- Gathering and analyzing the data-related requirements; developing a plan and determining the best solutions or design with full authority to translate the requirements into practical solutions in designing and building databases with high performance and scalability.
- Ensuring the ongoing efficient operation of databases by providing database administration including user management, database monitoring, troubleshooting, database tuning, query optimization, database backup and recovery, database systems update, upgrade and migration etc.
- Ensuring the integration of data from multiple data sources and implementing BI solutions to produce reports and data analysis.
- Building, testing, and maintaining database SQL queries, stored procedures, triggers, and functions as needed to support development projects and reports.

- Coordinating with the development team and business stakeholders to make sure CCOHS data strategy and best practices are followed in data structure, database systems and information architecture design; reviewing and evaluating existing database infrastructure and processes and making recommendations to operations and development teams to ensure data security, privacy and database performance and scalability.
- Reviewing own work as well as work from others related to database operations and processes to ensure data security and database performance. This incumbent has full authority in making changes to databases and implementing database solutions.
- Providing technical guidance on data collection, data flow design, data security, and database systems implementation in database related projects, as one of a few senior members of the team to make significant contributions across multiple service units. Reviewing and approving major changes to existing database design, or development on new data structure or systems design.
- Completing work agreed to and assigned in project team plan following the agreed timelines.

WORKING CONDITIONS

Physical Effort:

The employee works at a computer (keyboarding and mousing to read and reply to e-mail, prepare reports, review information, etc.) for the majority of the workday. The work is interspersed with non-computer based activity, such as reading, thinking, proof-reading, photocopying, filing. The employee has some control over the workload and can get up, stretch, and walk on a regular basis. Some stooping and lifting (or handling of light material) may be required.

Physical Environment:

The employee works at a desk and/or a computer workstation with a keyboard and a mouse for the majority of the workday. The workstation and desk are ergonomically set up, with a wrist rest, mouse rest, document holder, task lamp, as required. The lighting meets standards and there are adjustable blinds on the windows as required. The building environmental controls meet general office requirements. Some risk of RMI due to intensity and duration of work unless safe work procedures outlined are followed.

Sensory Attention:

The position requires concentration to compose, enter data, proof-read, quality assure, read routine information, communicate with others via e-mail, search for information and listen to others carefully to understand and resolve issues. The work requires close concentration when programming, debugging database software programs/applications, and troubleshooting problems.

Mental Stress:

There are priorities and deadlines which need to be met on a regular basis. There are interruptions from colleagues, supervisor or telephone calls. The employee has some control over the pace of work. Work may be repetitious. The position is usually involved in multiple projects and must support multiple products and services at the same time therefore must adjust to frequently changing priorities and deadlines, and there are interruptions while concentrating on complex technical research and development work. Missing deadlines could have a huge impact on development and project teams, and errors in systems or data could result in decreased user base or financial loss for CCOHS. Database support or potential data recovery due to issues or problems in production environment such as CCOHS e-commerce database requires emergency response, which could disrupt the incumbent's lifestyle.

SPECIFICATIONS

- A university degree in Computer Science, Information Systems or Mathematics, or college diploma with concentration in computer technology or an equivalent combination of education and experience.
- 5+ years experience in MySQL database design and administration; extensive experience in MySQL user management, access control, data security, database performance monitoring and tuning, troubleshooting, database backup and recovery strategy, database upgrade and migration.
- Experience in other RDBMS such as SQL Server or FileMaker is desired, and experience in setting up and managing MySQL or other databases in AWS RDS is preferred.
- 5+ years working experience in Unix/Linux or AWS cloud environment and familiarity with Unix/Linux command lines or AWS RDS configurations.
- Hands-on experience in writing SQL queries, Stored Procedures, Functions and Triggers, as well as analyzing and optimizing queries.
- Thorough comprehension of highly scalable database architecture and experience in implementing database replication and database caching.
- Experience in Redis or AWS cloud solutions is an asset.
- Experience in developing APIs or data access modules using one of the following programming languages or frameworks: PHP, Python, NodeJS and Microsoft C#.
- Experience in integrating multiple sources into a centralized data platform or Enterprise Data Warehouse is preferred; knowledge of NoSQL databases such as MongoDB is an asset.

- Ability to work and collaborate with a cross functional team containing IT Systems Analyst, Web Developer, and business stakeholders.
- Excellent technical writing skills in documenting systems analysis, data flow, database processes and procedures.
- Excellent interpersonal and communications (verbal and writing) skills.