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| **Template 1** |
| **Devon database design report** |
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| **Business overview**  Devon Technical College is a school with 450 students in Melbourne's west. It covers many subject areas, including business, community services, education, information technology, health, hospitality, etc. Students can undertake self-directed or trainer-led learning and be assessed. With self-guided courses, the trainer/evaluator is always available to deal with student queries, while other courses are led by the trainer.  The company has a sound procurement procedures and organizational policies and standards. |
| **Overview of the database design and security plan.**   D**atabase design：**  **Use and overview of the database：**  MySQL has been used for database design and development and will be used for data warehouse implementation as well.   The system is an integrated Web application for handling various academic and non-academic activities of the university and the system is a simple and powerful joint integration platform that connects all the various departments of the institution, such as management, attendance, staff details and many other professional modules.   |  |  | | --- | --- | | System Overview | Details | | System name | DTC 1 | | System type | Web Application | | Operational status | In development | | Database Name | PLC Database |   System architecture  The DTC1 system has been developed as a Web application. The clients are written in JavaScript and HTML5, which are generated using Java Server Page technology. The client-side part runs in a Web browser and communicates with server-side software, which consists of a set of Java servlets that communicate with the database.    **security plan：**   2 potential risk factors   • "PARKING LOT" ATTACK  The wireless signal access point transmits radio signals in circular mode. However, due to the reason of buildings, the signals are almost always blocked by buildings, resulting in poor reception of wireless signals. Therefore, some attackers will use "parking lot" attacks and attempt to access internal hosts over a wireless network.   • SHARED KEY AUTHENTICATION FLAW  An attacker can easily exploit shared key authentication through passive attack by eavesdropping on challenges and responses between access points and authenticating clients.  2 methods to improve database security：   1.WPA is a security protocol designed to create secure wireless (Wi-Fi) networks.  For encrypted data transmission to work properly, WPA uses the Temporary Key Integrity Protocol (TKIP), which dynamically changes the key used by the system. This prevents intruders from creating their own encryption passwords to match those used by secure networks.  WPA also implements the extensible Authentication Protocol (EAP) for authorizing users. WPA can use several other methods to verify the identity of each computer, making it difficult for unauthorized systems to access wireless networks     2. Wi-fi Protected Access 2 (WPA2) is a new wireless security protocol based on IEEE 802.11i. Only users authorized by the administrator can access this wireless device. WPA2 has stronger encryption (such as advanced Encryption Standard or AES) than WPA. Stronger authentication controls (such as extensible authentication protocols or EAP), its management of keys, and greater protection against network attacks and data integrity. |
| **Research big data applications and write any two applications that relevant to the organisation.**   LearnWords：  1. Very easy to set up and create courses  No technical skills are required to use it  Since what we need is an efficient learning tool, we need to avoid complex steps. LearnWords is very easy to set up and create courses and doesn't require any technical skills to use, which greatly improves our productivity.  2. Since we purchase in large quantities, the annual pricing will be cheaper, reducing the pressure on RTO to bear the cost.  3. Provide a fully customizable, code-free mobile application generator for iOS and Android.  4. Includes various learning tools and assessment engines  5. Teachers and schools can keep track of students' progress in real time.  6. Provide a strong prerequisite system   CMS Hub (CMS):  1. The key points :  Integration with HubSpot's marketing, sales, service, and CRM tools  CMS applications and templates available in HubSpot Marketplace  Globally hosted CDN, round-the-clock threat monitoring, and built-in WAF ensure site security  Two advanced programs are offered  2. Ease of use  CMS Hub is a powerful platform for users with little technical knowledge to instantly build custom websites. With the CMS Hub, you can manage, optimize, and track the performance of your content using the same platform used to create it.  3. customizability  It can be formulated according to the current situation of the RTO.  4. security  Another advantage of HubSpot's application ecosystem is that it provides an additional layer of security for your website. Unlike the open source CMS platform, HubSpot works selectively with third-party vendors and applications that can integrate with existing portals. This means you don't have to master plug-in compatibility or maintenance to keep RTO's site secure.  RTO also doesn't have to worry about installing plug-ins like Duo to protect RTO sites from threats. Instead, RTO can rely on CMS Hub's built-in security features (including global CDN and Web application firewall) and a dedicated security team to protect RTO's site from DDoS attacks, hackers, and other anomalies.   5. The pricing is relatively moderate, and the pricing negotiation can be customized according to the order quantity, which alleviates the economic pressure of RTO. |
| **Compare database design document including database access and security design with the Devon security plan for current and future need of the organisation.**  **Include database table, relationship and database report requirements.**   Database related entities:  Course  Schedule  Section  Instructor   identify table relationships   Make sure the Section table is the main page,  The Schedule ID in Section can be connected to the Schedule table. You can connect to the Course table with the Course ID in Section.  The Instructor ID in Section can be connected to the Instructor table    **database report requirements**   Course   Sets the size of rows, columns, and text.  Add course ID, course name, etc  Schedule   Sets the size of rows, columns, and text.  Add Schedule ID, start time, end time, etc  Section  Sets the size of rows, columns, and text.  Instructor   Sets the size of rows, columns, and text. |
| **Identify the database security requirements based on security plan.**   Safety requirements and improvement  The school needs to back up the original database, import it to the new database, and ensure the backup, rewrite and describe the new database.  Ensure that schools add various security protocols such as WPA and WPA2 to protect the security of the system.  Setting up a firewall:  • Firewall must be placed between router and ISP  • Block all the porn sites and harmful content websites for the students and staff  • Block all the websites without valid digital certificate  • Scan all the new website and content first        **Database technical specifications**  1. Database application name: SQLServer2022  2. Hosting platform: dedicated  3. Installation cost: none, can be downloaded from Microsoft official website.  SQLServer2022  Advantages:  1. Use Azure to implement business continuity  Fully managed disaster recovery in the cloud with linking capabilities in Azure SQL managed instances to ensure uptime. Continuously copy data to or from the cloud.  2. Seamless analysis of local operation data  By bridging the gap between operational storage and analytical storage, driving insights in near real time, you can analyze all your data in the cloud using Spark and SQL runtimes with Azure Synapse Link.  3. Visibility to the entire data asset  Manage and govern the entire data asset to overcome data silos through SQL Server integration with Azure Purview.    4.Industry leading performance and availability  Leverage performance and availability improvements to speed up queries and ensure business continuity. Speed up query performance and tuning without code changes. Keep the multi-write environment running smoothly when your users are in more than one location.  Potential problems:  1.Reports may be generated very slowly due to increased usage time.  2. There is a compatibility problem with the version and it may be unavailable after subsequent updates.  Hardware  Microsoft SQL server  Advantages  1. Improve data security  One of the main purposes of Microsoft SQL Server is to ensure database security, especially with Microsoft SQL Server database management services. The software allows you to use a table structure of join functions and data elements, which helps protect the data you own. Database security and integrity are a must for databases with client information and other sensitive data.  2. Easy to configure  Unlike other database management software, Microsoft SQL Server is easier to install and configure. You don't need a specific toolkit to install the software, and updates are completely automatic. You can also install other components to modify the business software without any complex processes. Therefore, if you are looking for a convenient database management software, Then Microsoft SQL Server is your best choice.  3. Optimize data storage  With Microsoft SQL Server, if you are using another device, you do not have to store another data from the same database. This allows you to easily and efficiently manage data with minimal troubleshooting and maintenance. As a result, you can save time and work on other important aspects of your business.  4. Data recovery  In the event of a power outage or server shutdown, data can be corrupted, a major problem for businesses with little backup storage. Microsoft SQL Server eliminates the risk of data loss by providing data recovery and restoration functions. So no matter what happens to the server, you can be more secure in knowing that your data is protected with caches, log files, and frequent backups.  Potential problems   1. Limited compatibility 2. Hardware limitations   Newer versions of Microsoft SQL Server require advanced technology to run. Therefore, if the RTO's hardware consists primarily of older hardware, you may need to invest in a newer machine to use Microsoft SQL Server. |
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