Reports

1. Considering the schema devised and implemented in Part A as a starting point, what changes or evolutions would you make from a design and/or technical perspective to improve it?c

Taking into consideration the devised schema for Wombat Widgets International (WWI), it is clear that the Human Resources (HR) and Payroll system is effective in storing and manipulating data, as well as allowing for certain information to be gathered and returned which was evident in my queries in Part A. In my opinion, it is important that a database provides the ability to display key information and improve functioning characteristics. Nevertheless, there are changes and evolutions that can be made to the design and technical perspective of this relational database to improve it. Firstly, in order to boost the database design I would evaluate the Primary Key attributes to reduce referential integrity as entering data can be very repetitive and this leads the user prone to making more mistakes. Secondly, I believe naming conventions are very important. For example in the Skill Table, the attribute ‘Title’ should really be more specific eg. Skill\_Title. In a similar way in the Item Table, the attribute ‘Title’ should read ‘Item\_Title’ to provide a more accurate set of details and to reduce the chances of getting mixed up between the two attributes. Another naming convention issue worth noting is the lack of accuracy in the Skill Title. Adding a Skills\_Description entity would do numerous wonders to describing each attribute more clearly. Another change I would make if I were to improve this database would be the use of indexing appropriately. I believe more accurate indexing would help in the performance of the database. It can also be said that any attributes that have been indexed and are not used to insert, delete, update or retrieve information reduce the performance of the database. In regards to the design, I believed that the schemas could be more consistent and specific with the addition of more detail. One way of ensuring this is by adding general or specific validation to certain attributes. For example, more ‘Format Rules’ could be implemented or more constraints on the length of fields. By doing this, data inconsistency could be overcome and in turn, improve the accuracy and reliability of the data being stored.

1. The HR system needs to be totally secure and operate at high speed at a number of international company locations, how would you suggest the infrastructure is setup to run the database system to meet security, availability, and performance requirements?

After implementing the database in part A, its time to think about how I would deploy it in the real world. One way of doing so is to keep a back up of all the data which will reduce drive failure and site loss. Another way of deploying the database in the real world which will also boost the database performance is the use of replicas to provide a live real-time copy of the database.

With regards to making the system secure, authentication and authorisation together make up the security of a database. This includes knowing ‘who can do what’ and ‘who the user is’. Together these have the power to secure the system if carried out effectively and efficiently. Obviously, only the people within the HR Department will be able to gain access to the database as it contains confidential information about each of the employees, e.g. email address, payslips etc. The integrity of the database is important in terms of ensuring only the correct people have access to privileged company information . Security implementations like authentication protocols and ensuring unused accounts (like of employees that are no longer current and have left the company) are locked or deleted, further strengthen the integrity of a database and hence improve the performance. As WII use a multi access model to the database, i.e. several users use the database at one time, I would consider locking down the access with limited GRANTS. Another idea would be to use SQL Injection to create a login form. This would involve every user being given a username and password to enter at the log in stage to identify and authenticate them – hence giving them access to the database. Failure to enter the correct credentials can be tracked by the company to discover hackers.

In terms of availability, the WWI database must be up and available to use. This HR and Payroll system must be dependable in order to be functional, which requires it is up and running whenever the company is. Availability includes four unique components, which, together ensure the database performs as it should. These are: manageability, recoverability, reliability and serviceability. In order to maintain availability the system must uphold an effective setup that delivers service to others. This service must have the ability to re-establish service in the event of an error. If they do occur, these errors must be identified, their causes diagnosed and their problems repaired.