General Project Requirements

Please submit one (1) and only one Microsoft Word Document for the entire team. Only one team member is required to submit the document to avoid confusion.

Main headings should exist for each major section. The first and last name must precede the heading of the person that completed it. For example, Amy Smith's Introduction. Amy Smith's Screenshots. Etc. Do NOT include more than one person per heading or the work cannot be properly identified. Use sub-headings instead where additional attribution is needed with one person per sub-heading.

The word document must include an honesty statement compliant with these instructions. The word document must have well supported answers to each problem and progressive, step-by-step screenshots that validate authenticity. Screenshots must identify the student uniquely for credit. Screenshots must include actions in the tool they were developed. For example, code needs to be in the IDE that it is compiled. Performance improvements must include the operating system (OS) command line interface (CLI) of the VM and OS of the computer the VM is running on.

Please explain answers with your own understanding and words rather than using prior written work. Only original and/or student authored answers, code, scripts, and/or configurations will be considered for credit.

Note, learning often requires us to experience challenges, problems, and errors. If you run into issues, troubleshoot the errors thoroughly and do your best to solve the associated problems. It is better to submit incomplete work than no work or late work, which will not be granted credit.

Project Background

<Your Group Name> company operates in the US. <Your Group Name> is expanding into the digital marketing business. In this aspect of its business, <Your Group Name> is helping organizations sell their products more effectively on the Internet.

Due to its success, <Your Group Name> is expanding throughout the world. It must implement its own private cloud architecture to accomplish this goal. Its initial data centers will be designed by the project team and implemented in the major cities of Los Angeles US, Tokyo Japan, and Buenos Aires Argentina. Variations in policies in these three (3) different countries will be considered in successful projects.

A distributed database management system (DDBMS) is necessary to manage its data. A distributed database design is necessary that meets the needs of a new private cloud-based application that is globally accessible. Your goal will be to design the IT architecture that supports the distributed database(s). Additionally, you will design and implement the physical distributed database as a prototype using enterprise Linux Server Virtual Machines (VMs). Once the new database is created and the tables are populated, you will write supporting data reports via SQL and optimize these using explain plans. Finally, your group will give professional presentations on your team's solution and respond to feedback for improvement.

<Your Group Name> currently employs 2,000 personnel who serve as accountants, human resource experts, systems analysts, developers, managers, testers, maintenance engineers, lawyers, chefs, and marketing experts. Records for each individual are essential, from an associated supervisor to departmental roles. As the company expands, these employees will be co-located in the major cities where the company resides.

Digital marketing clients are recognized by various names, have different organizational structures, and tailor to different products. For example, one company may sell jewelry in Japan only while another may sell jewelry on the Internet and ship worldwide. The sales department refers to digital marketing clients by typical names, the legal department uses legal names, and the international marketing department uses IDs.

<Your Group Name>'s sales representatives must know a prospective client's billing, sales, and contact information. Prospective companies can have one or more contracts with <Your Group Name>. Some clients have pre-exchanged contracts for which that are billed, these are often referred to as "fixed price." Alternatively, hourly contracts exist that require labor rates/hours to calculate billing details. <Your Group Name> managers must guarantee that when maximum (cap) contact hours are past what the client agreed to, that the prospective companies are not billed for such additional hours. Rate per hour for the digital marketing organization must be researched in the major cities of operation as estimations for different levels of managers, sales

force, and network marketers to help promote the prospective company products in their regions of operation.

<Your Group Name> employees must use timecards for all hours worked. These must associate with specific prospective companies that you will perform digital marketing.

The number of hours worked for the workforce is a daily task. An example time card looks like this:

Employee Name: John Doe
Supervisor Name: Jim Smith

Month: September	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Totals
Project(s)																															
BT	5	8	8	8						4	4			8	8	8	8	8												4	81
IBM	3							8	8	4	4										8	8	8	8	8			8	8	4	87
Totals	8	8	8	8	0	0	0	8	8	8	8	0	0	8	8	8	8	8	0	0	8	8	8	8	8	0	0	8	8	8	168

Personnel can be assigned to many digital marketing projects. Projects can span across multiple prospective marketing organizations. Similarly, a marketing analyst can be promoted from the US region to other locations such as Japan. An example problem that this creates is variations in the maximum hours worked in a week and over time calculations per country. Certain countries have maximum hours per week that an employee can work and therefore this needs to be recorded and monitored by supervisors. Therefore, the DDBMS must have a carefully planned out Human Resources portal that can manage all types of employees throughout the global company, considering variations in policies in at least three (3) different countries.

In addition to HR functionality, a Project Manager is assigned to every prospective company. The project manager is responsible for all projects associated with prospective clients. For example, there may be a project to update the social media advertising algorithm. There may be a project that helps create new data analytics reports to help the prospective company grow its sales.

Finally, contracts exist with the prospective companies and <Your Group Name>. These contracts help the prospective companies keep track of investments into digital marketing and its effectiveness on generating revenue, customer satisfaction, and other key variables in three different countries and cultures. Contracts can consist of multiple projects. Contracts should have an investment amount and maximum labor hours per country to implement the new digital marketing strategies. If a contract specifies a maximum number of hours of labor the company is willing to invest into digital marketing, the project managers of each project should agree how to split up the max cap amounts between the two projects and maintain appropriate reporting on

hours. Hours are important in the database, including contract, project, and personnel hours. Billing and invoice management systems will also need access to these hours.

These are some of the minimum requirements that the team must include when designing, developing, and implementing the optimal DDBMS solution for the company. The group should decide on any additional tables necessary to support this new business venture. It must also consider the physical IT infrastructure design and associated changes. For example, the architecture of the distributed database should consider physical database locations in the primary cities to best serve prospective clients. Below are the project deliverables followed by the grading rubrics. Review these closely to ensure your group meets the final project requirements.

Phase 2 Project Requirements

- Refer to the project grading rubric for assessment details.
- EACH team member must show contributions to each row of the grading rubric to receive points for that section of the rubric.
- Place one (1) name next to each heading the student completed. For example, "Amy Smith Heading 1". Do not combine names with headings, one name per heading only.
- If your name is not associated with the writing and/or screenshots in the Microsoft Word document, no points will be granted for the associated section where you are not identified as contributing work.
- An APA formatted paper that includes all project deliverables.
    - **One** APA formatted Microsoft Word document *per team* is required that includes the diagrams, screenshots, and configurations of the final solution.
    - Have the project manager submit the single Word document to D2L for the team.
    - Introduction that explains introduces the methods used to solve the problems.
    - The results report supports the final solutions. For example, it should describe the methods used to optimize the relevant hardware, software, and DDBMS with granular detail and accuracy.
    - Results report:
        - Is supported with industry best practices
        - Justifies the final design and database solutions
    - Develop a strong conclusion to the project.
    - Include all screenshots, diagrams, query results, stored procedures, explain plans, and SQL adjustment differences per the optimization plans in the appendices of the report.
    - Include the presentation/slides in an appendix.
- Optimize and implement the designed distributed database management system (DDBMS) on enterprise Linux Server VMs.
    - Describe all optimizations made, from the hardware to the software that supports a global DDBMS.
    - For example, were kernel, disk (e.g. RAID), or memory allocation customizations made?
    - Show replication and clustering of multiple distributed database nodes via Screenshots and the location of the individual VMs.
- Populate the distributed database tables with at least 20 relevant and practical records each.
    - Each student is required to create and populate a minimum of 5 tables.
    - Each student should share their scripts at least 7 days in advance of the deadline with the team so all databases are the same on each student's computer.

- Develop and implement effective SQL reports that assist the company's managers
    - SQL reports must correlate with the tables the student designed and scripted. This means all team members will be using different tables.
    - Each student is required to create a minimum of three (3) unique SQL reports that allow management to track the effectiveness of varying types of digital marketing campaigns (e.g. social media, content marketing, pay-per-click).
        - For example, create a SQL report that tracks overtime hours of all employees by country and identifies if/when overtime occurs given the associated government's maximum allowable hours per week (research labor laws to complete).
    - Each student is required to create a minimum of one stored procedure that helps maintain or optimize the DDBMS. It must contain at least three valuable functions and use three (3) or more tables during implementation that help the customers.
    - Students must present their populated tables in a DDBMS and stored procedures during the in class presentation live on their computer for verification.
    - Students that cannot show a working DDBMS in class presentations will be given deductions.