Database Management System

use case

G. Peeraiah
VTU 30385
Slot-S9

Array Supply Chain . Bill of materials and maintaiance cost management.

The nations Armed forces, the support for more than 1 million Soldiers and about 200,00 civilian staff. Each of these staff members relies on multiple pieces of Equipment, from helicopters and armoured vehicles to small arms to Complete their missions. Cost maintanence, operations and support Costs of Equpiment representing as Much as 80% of total lifecycle costs, its imperative that the Defence ministry track and analyze Equipement maintainence costs including changing historical data Sources Dimension with More flexbility like graph database and to be given richer analysis like forecast Replacement Parts with the location and eliminate, mean time to failure rates, logistics and Such as the cost of deploying Certain forces and Supporting Equipment to a new warzone? Could the model perform multi-dimensional Cost Comparison and trend analysis? will the solution promises How the data management is unpredictable maintance Costs.

Deployment Cost

Personnel ID	Equipment ID	Transport ID	quantity	unit cost	weight per unit	Deployment Days	Allowance Per Day	Transport Cost per kg	First transfer Cost	Total
1001	2001	3001	10	50000	800	30	150	25	20000	Calculated
1002	2002	3002	5	120000	1200	45	200	35	35000	Calculated

1. What
Equipmen

1. What if the cost of deploying certain forces and supporting Equipment to a new warzone?

```
SELECT
    sum (P. Deployment Allowance * D. Days Deployed) As
Personnel Cost
    SUM(E. Quantity * E. unit cost). As Equipment cost,
    sum (E. quantity * E. weight * T. Cost perkg + T. Fixed Cost) As
Transport cost:-
    SUM (P. Deployment * Allowance * D. Days Depolyed + E. quantity *
    E. unit cost + (E. quantity * E. weight * T. Cost perkg + T.
                                    Fixed Cost))
As Total Deployment cost FROM
  Deployment D
  INNERJOIN Personnel P ON D. Personnel ID = P. Personnel ID
  INNER JOIN Equipment E ON D Equipment ID = E. Equipment ID
  INNER JOIN Transport T ON D Transport ID = T. Transport_ID.
WHERE
    D. Destination = 'New warzone';
```

2. Could the model perform multi-dimensional cost comparsion and trend analysis.

- Yes, a well defined or designed database model can perform multi dimensional cost comparsion and trend analysis

Multi- Dimensional cost Comparision in DBMS

- Modern DBMS and data warehousing solutions can store and analyze data across different dimensions
- By integrating historical Records and linking transactional tables the model supports complex queries for side-By-side Comparison and cost Break downs

Trend analysis

- Analysis can visualize trends in cost, Equipment failures, logistics delays supporting proactive decision making.
- With time-stamped data and will structured schema, DBMS can Reveal cost trends, predict future maintainance needs and forecast logistics Requirement by aggregating and analyzing Period-over-period changes.

Ex:-

```
SELECT Year SUM (Total cost) As yearly total,
AVG (Equipment failures) As Avg failures
FROM Maintainance Trend
GROUP By year;
```

3. will the solution promises how the data managment is unpredictable maintainance cost?

- Yes, the solution using advanced data management such as a DBMS integrated with predictive analytics - does address the challenges of un predictable, maintaince costs in army supply chains

- Modern data management systems allow for centralized storage of historical and real time maintainance data storage of making is possible to identify Patterns, forecast future Maintainance needs and optimizing spending.

How Data Management addresses unpredictable Maintainance cost:-

- Centralized data visibility.
- Predictive maintainance capabilities.
- Trend analysis
- Data-Driven Decision Support