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RESEARCH LABS

INNOVATION. AUTOMATION. ANALYTICS

PROJECT ON

EMPLOYEE MANAGEMENT SYSTEM

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Batch: 436

About me

- **Name:** Kandela Vamshi

- **Qualification :**
  Bachelors In Data Science (2025)

- **My Profile**:
  AS A Passionate on Making “Data into Meaningful insight”

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Agenda

- Business Problem
- Objective of the Project
- ER Diagram and schema explanation
- SQL query results with screenshots or summaries
- Final business insights and recommendations
- Conclusion (Key finding overall)
- Q&A

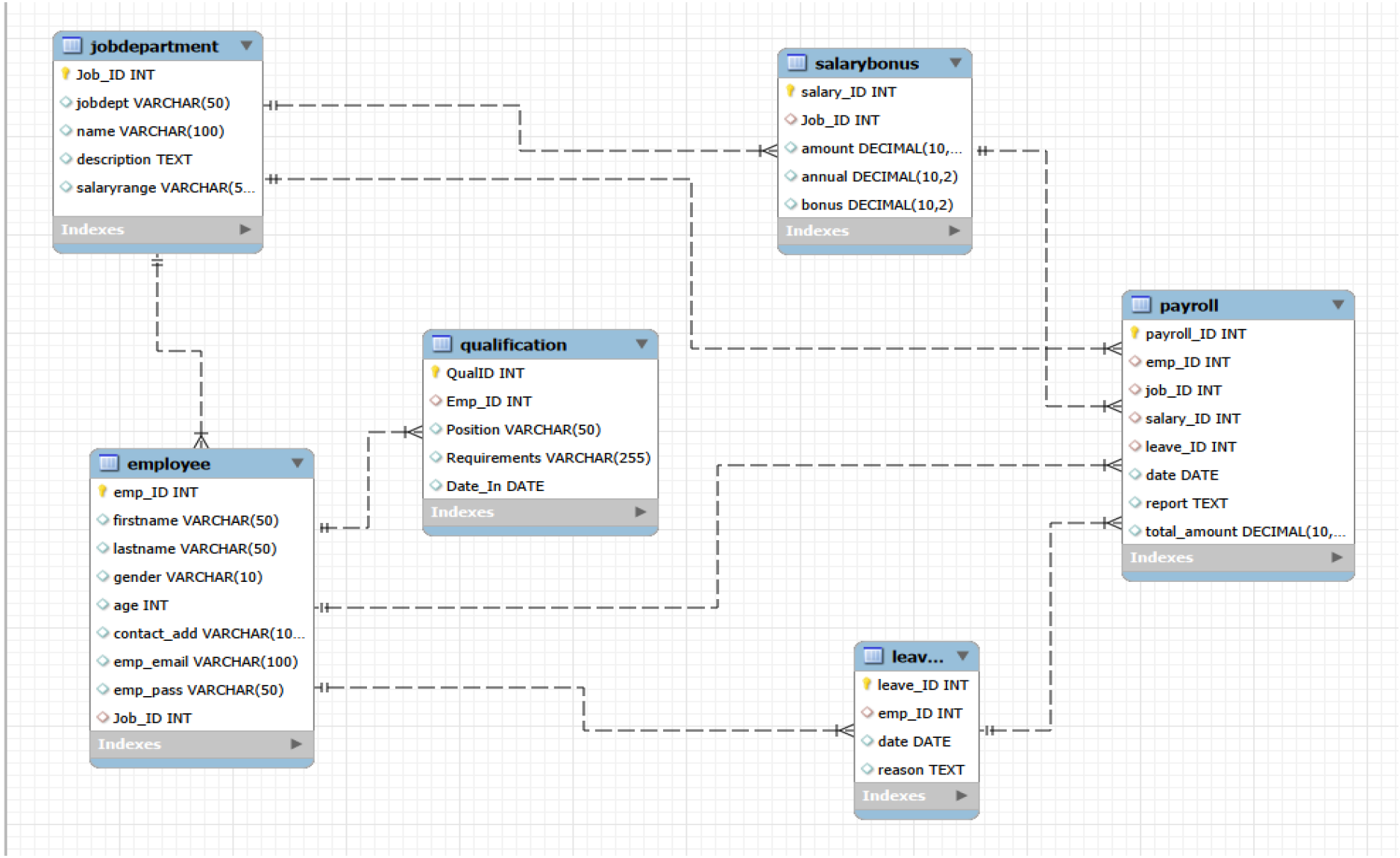
BUSINESS PROBLEM

- In MNC Companies it is difficult to manage employee details using Excel files and manual records.
- As the company grows, this approach leads to confusion, data errors, and delays in salary processing.
- Managers find it difficult to track employee attendance, roles, and performance in one place.
- Generating reports for decision-making becomes time-consuming.
- To solve this, the company needs an SQL-based Employee Management System to manage employee data efficiently.

OBJECTIVE

- To design an efficient Employee Management System that centralizes employee records and automates HR processes.
- To streamline employee data handling such as attendance, roles, and performance tracking.
- To minimize manual errors and improve operational efficiency through structured data management.
- To support data-driven decision-making by providing accurate and real-time employee insights.

ER DIAGRAM



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Employee Table

emp_ID	firstname	lastname	gender	age	contact_add	emp_email	emp_pass	Job_ID
1	John	Doe	M	30	123 Elm St, NY	john.doe@example.com	password123	1
2	Jane	Smith	F	28	456 Maple Ave, CA	jane.smith@example.com	password123	2
3	Alice	Brown	F	35	789 Oak St, TX	alice.brown@example.com	password123	3
4	Bob	Johnson	M	40	101 Pine St, FL	bob.johnson@example.com	password123	4
5	Charlie	Williams	M	33	202 Birch Rd, IL	charlie.williams@example.com	password123	5

Job Department Table

Job_ID	jobdept	name	description	salaryrange
1	Operations	Operations Engineer	Responsible for engineer duties in the operation...	$70889 - $91502
2	Finance	Finance Consultant	Responsible for consultant duties in the finance ...	$45757 - $102274
3	IT	IT Coordinator	Responsible for coordinator duties in the IT dep...	$32637 - $118326
4	Marketing	Marketing Engineer	Responsible for engineer duties in the marketin...	$48936 - $145464
5	Finance	Finance Specialist	Responsible for specialist duties in the finance d...	$67562 - $99403

Qualification Table

QualID	Emp_ID	Position	Requirements	Date_In
1	1	HR Assistant	BBA Communication Skills	2019-12-06
2	2	HR Manager	MBA 5 Yrs Exp	2018-03-20
3	3	IT Support	B.Tech (IT) Troubleshooting	2020-01-15
4	4	Software Engineer	B.Tech (CS) Java/Python	2021-04-01
5	5	Data Analyst	B.Sc Stats Excel SQL	2020-08-11

Salary Bonus Table

salary_ID	Job_ID	amount	annual	bonus
1	1	45000.00	540000.00	5000.00
2	2	55000.00	660000.00	7000.00
3	3	40000.00	480000.00	4000.00
4	4	48000.00	576000.00	6000.00
5	5	47000.00	564000.00	4500.00

Leaves Table

leave_ID	emp_ID	date	reason
1	1	2024-01-15	Medical Leave
2	2	2024-10-02	Personal Work
3	3	2024-05-03	Sick Leave
4	4	2024-01-25	Family Emergency
5	5	2024-10-03	Travel

Payroll Table

payroll_ID	emp_ID	job_ID	salary_ID	leave_ID	date	report	total_amount
1	1	1	1	1	2024-04-30	April Payroll	40500.00
2	2	2	2	2	2024-04-30	April Payroll	45500.00
3	3	3	3	3	2024-04-30	April Payroll	39500.00
4	4	4	4	4	2024-04-30	April Payroll	43500.00
5	5	5	5	5	2024-04-30	April Payroll	38500.00

SQL query results with screenshots or summaries

Who are the top 5 highest-paid employees?

Query

```
SELECT
    emp_id, firstname,lastname,amount
FROM
    employee e
        JOIN
    salarybonus s ON e.job_id = s.job_id
ORDER BY (amount) DESC
LIMIT 5;
```

Output

emp_id	firstname	lastname	amount
37	Ingrid	Adams	170000.00
38	John	Baker	160000.00
35	Grake	Moor	150000.00
36	Hank	Wilson	150000.00
39	Kelly	Cooper	140000.00

What is the average salary range per department?

Query

```
SELECT
    d.jobdept,
    MIN(amount) min_salary,
    MAX(amount) max_salary,
    ROUND(AVG(amount), 2) avg_salary
FROM
    jobdepartment d
        JOIN
    salarybonus s ON d.job_Id = s.Job_Id
GROUP BY (jobdept);
```

Output

	jobdept	min_salary	max_salary	avg_salary
▶	Operations	31000.00	135000.00	68750.00
	Finance	32000.00	170000.00	72333.33
	IT	35000.00	150000.00	70888.89
	Marketing	35000.00	150000.00	65625.00
	Engineering	42000.00	160000.00	81142.86
	Sales	33000.00	140000.00	75428.57
	HR	34000.00	120000.00	62571.43
	Legal	40000.00	130000.00	84600.00

How many different job roles exist in each department?

```
SELECT
    d.jobdept departments, COUNT(DISTINCT (d.name)) jobroles
FROM
    jobdepartment d
GROUP BY (d.jobdept);
```

departments	jobroles
Engineering	7
Finance	9
HR	7
IT	8
Legal	5
Marketing	7
Operations	8
Sales	7

Which departments have the highest total salary allocation?

```sql
SELECT
    d.jobdept department, SUM(s.amount + s.bonus) totalsalary
FROM
    salarybonus s
        JOIN
    jobdepartment d ON d.Job_ID = s.Job_ID
GROUP BY (jobdept)
ORDER BY totalsalary DESC
LIMIT 3;
```

	department	totalsalary
▶	Finance	747000.00
	IT	732000.00
	Engineering	656000.00

What is the average bonus given per department?

```
SELECT
    d.jobdept, ROUND(AVG(s.bonus), 2) avg_bonus
FROM
    jobdepartment d
        JOIN
    salarybonus s ON d.job_Id = s.job_id
GROUP BY (d.jobdept)
ORDER BY avg_bonus DESC;
```

jobdept	avg_bonus
Legal	13300.00
Engineering	12571.43
Sales	11214.29
Finance	10666.67
IT	10444.44
Operations	9687.50
Marketing	9125.00
HR	8171.43

What is the total monthly payroll processed?

```
SELECT
    MONTH(date) monthly_payroll, SUM(total_amount) total_payroll
FROM
    payroll
GROUP BY (monthly_payroll);
```

	monthly_payroll	total_payroll
▶	4	2778000.00

Which department receives the highest total bonuses?

```
SELECT
    d.jobdept department,SUM(s.bonus) totalbonus
FROM
    jobdepartment d
        JOIN
    salarybonus s on d.job_id=s.job_id
GROUP BY (jobdept)
order by totalbonus desc limit 1;
```

	department	totalbonus
▶	Finance	96000.00

Which employees have taken the most leaves?

```sql
SELECT
    e.emp_id,
    e.firstname,
    e.lastname,
    COUNT(l.leave_id) no_leave
FROM
    leaves l
        JOIN
    employee e ON e.emp_id = l.emp_id
GROUP BY e.emp_id , e.firstname
ORDER BY no_leave DESC
;
```

emp_id	firstname	lastname	no_leave
1	John	Doe	1
2	Jane	Smith	1
3	Alice	Brown	1
4	Bob	Johnson	1
5	Charlie	Williams	1
6	Dave	Miller	1
7	Eve	Davis	1
8	Frank	Wilson	1
9	Grace	Moore	1
10	Harry	Taylor	1
11	Irene	Anderson	1
12	Jack	Thomas	1
13	Karen	Jackson	1

What is the total number of leave days taken company-wide?

```sql
SELECT
    COUNT(leave_id) total_leaves
FROM
    leaves;
```

total_leaves
60

What is the total salary expenditure across the company?

```sql
SELECT
    SUM(annual + bonus) AS totalsalaryexpenditure
FROM
    salarybonus;
```

	totalsalaryexpenditure
▶	52482700.00

Final business insights

Finance, IT, and Engineering departments account for the highest salary and bonus expenditures, indicating strong investment in core business functions.

Top-paid employees are concentrated in specialized roles, reflecting market-driven compensation strategies.

Bonus allocation varies by department, with Finance leading, highlighting performance-based reward structures.

Leave utilization is controlled and evenly distributed, suggesting effective workforce management and stable employee engagement.

Recommendations

- Review high-compensation roles to ensure performance alignment.
- Balance departmental salary and bonus budgets with business outcomes.
- Strengthen fair, performance-linked incentive structures.
- Use workforce data to support smarter HR and financial planning.

Conclusion

•The Employee Management System provides clear visibility into salary, bonus, and leave patterns across departments.

•Insights show that compensation is strategically focused on high-impact roles and core business functions.

•Balanced leave usage reflects a stable and well-managed workforce.
•Overall, the system enables data-driven HR decisions, cost control, and improved workforce planning.

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