The Accenture Workforce Analysis

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Introduction

This project is a complete **Employee Management System** built using a MySQL database. Its main purpose is to store and manage all the important information for a company, like employee details, their salaries, which departments they work in, the projects they are assigned to, and their performance reviews. By analyzing this organized data, we can find useful patterns and answers to important business questions, such as how to better use the workforce, manage budgets, and reward top performers. This report will explore these insights to provide clear and practical recommendations for improving how the company operates.

Overview of the Schema

The database is made up of six main tables that are all connected, like a web of information. Here's what each table stores:

1. **employees:** The main list of all workers. It has their basic info like name, job title, salary, and which department they belong to.
2. **departments:** A list of all the different company divisions (like IT, Finance, HR), their location, and their budget.
3. **projects:** Details about every project the company is working on, including its start/end dates, budget, and current status.
4. **employee_projects:** This table connects employees to projects. It shows who is working on what and how many hours they are assigned.
5. **salary_history:** A history of every raise or salary change an employee has ever received, with the date and reason for the change.
6. **performance_reviews:** Records of all employee performance evaluations, including their rating, feedback, and who their manager is.

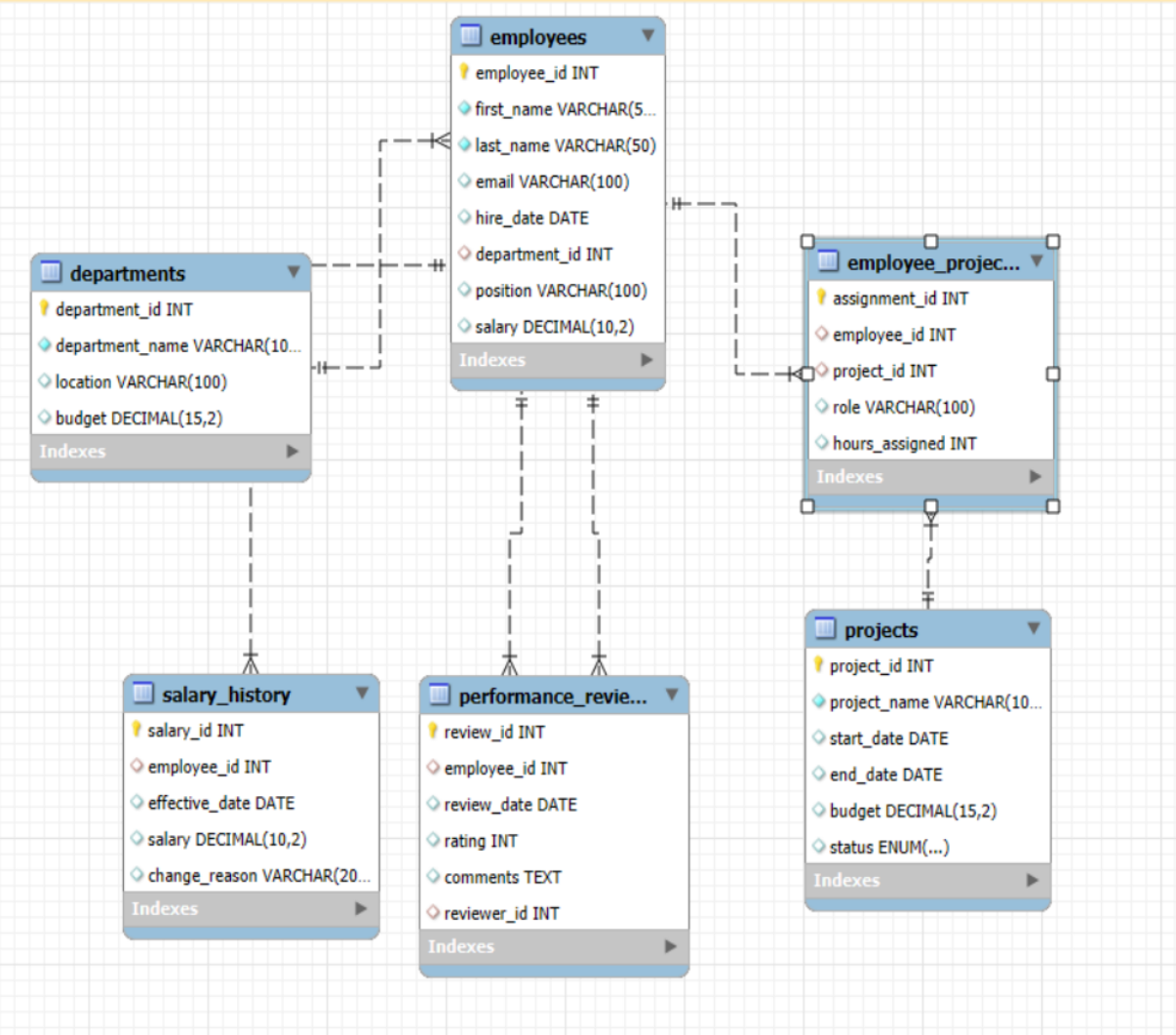
This connected structure allows us to ask complex questions about the company's data by joining these tables together in our queries.

Background

Traditionally, this data might be scattered across different spreadsheets and files, making it difficult to get a complete picture. This project addresses that challenge by implementing a centralized **Employee Management System** using a relational database (MySQL).

This system integrates all critical human resource and operational data into one organized structure. By bringing this information together, the company can move from simply storing data to actively analyzing it. This allows leadership to generate valuable insights, identify trends, and make informed, evidence-based decisions to support the company's growth and efficiency.

Entity Relationship Diagram [ERD]



Analysis 1: Departmental Overview & Financial Efficiency

Objective: To understand the structure, resource allocation, and financial health of each department.

1.1 Departmental Headcount and Budget Allocation

Purpose: This query shows which departments have the most employees and how the budget is allocated per person, highlighting potential over or under-funding.

Query:

```
SELECT
    d.department_name,
    COUNT(e.employee_id) AS number_of_employees,
    d.budget AS total_budget,
    ROUND(d.budget / COUNT(e.employee_id), 2) AS
budget_per_employee
FROM departments d
JOIN employees e ON d.department_id = e.department_id
GROUP BY d.department_id
ORDER BY number_of_employees DESC;
```

Output:

department_name	number_of_employees	total_budget	budget_per_employee
IT Services	18	50000000.00	2777777.78
Consulting	18	75000000.00	4166666.67
Human Resources	16	15000000.00	937500.00
Finance	16	20000000.00	1250000.00
Marketing	16	18000000.00	1125000.00
Data & AI	16	60000000.00	3750000.00

1.2 Total Salary Expenditure vs. Departmental Budget

Purpose: This reveals what percentage of a department's total budget is spent on salaries. A very high percentage may indicate limited funds for other operational expenses.

Query:

```
SELECT
    d.department_name,
    d.budget AS total_department_budget,
    SUM(e.salary) AS total_salary_expenditure,
    ROUND((SUM(e.salary) / d.budget) * 100, 2) AS
salary_budget_percentage
FROM departments d
JOIN employees e ON d.department_id = e.department_id
```

```
GROUP BY d.department_id
ORDER BY salary_budget_percentage DESC;
```

Output:

department_name	total_department_budget	total_salary_expenditure	salary_budget_percentage
Human Resources	15000000.00	1960000.00	13.07
Finance	20000000.00	2453000.00	12.27
Marketing	18000000.00	2103000.00	11.68
IT Services	50000000.00	3035000.00	6.07
Data & AI	60000000.00	2830000.00	4.72
Consulting	75000000.00	3090000.00	4.12

1.3 Average Salary and Tenure by Department

Purpose: This identifies departments with the most experienced (longest-tenured) and highest-paid employees, which can indicate centers of expertise or seniority.

Query:

```
SELECT
    d.department_name,
    ROUND(AVG(e.salary), 2) AS average_salary,
    ROUND(AVG(DATEDIFF(CURDATE(), e.hire_date) / 365), 1) AS
average_tenure_years
FROM departments d
JOIN employees e ON d.department_id = e.department_id
GROUP BY d.department_name
ORDER BY average_salary DESC;
```

Output:

department_name	average_salary	average_tenure_years
Data & AI	176875.00	24.9
Consulting	171666.67	24.1
IT Services	168611.11	23.6
Finance	153312.50	23.6
Marketing	131437.50	24.4
Human Resources	122500.00	23.5

Analysis 2: Workforce Performance & Compensation

Objective: To evaluate employee performance and its correlation with compensation and growth.

2.1 Distribution of Performance Ratings

Purpose: This shows the spread of performance scores. A healthy distribution is often bell-shaped; too many high scores might indicate rating inflation.

Query:

```
SELECT
    rating,
    COUNT(*) AS number_of_reviews
FROM performance_reviews
GROUP BY rating
ORDER BY rating;
```

Output:

rating	number_of_reviews
3	24
4	51
5	25

2.2 Average Salary for Each Performance Rating

Purpose: This is a simple and powerful query. It checks if higher performance ratings are actually linked to higher average pay. If a rating of 5 has a much higher average salary than a rating of 3, it shows the company rewards performance. If the averages are similar, it indicates a problem.

Query:

```
SELECT
    pr.rating,
    ROUND(AVG(e.salary), 2) AS average_salary
FROM performance_reviews pr
JOIN employees e ON pr.employee_id = e.employee_id
GROUP BY pr.rating
ORDER BY pr.rating;
```

Output :

	rating	average_salary
▶	3	75041.67
	4	127745.10
	5	286200.00

2.3 Correlation between Latest Performance Rating and Current Salary

Purpose: This lists employees alongside their latest performance rating and current salary, making it easy to spot high performers with low salaries or vice versa.

Query:

```
WITH LatestReviews AS (
    SELECT
        employee_id,
        rating,
        review_date,
        ROW_NUMBER() OVER (PARTITION BY employee_id ORDER BY
review_date DESC) as latest_rev
    FROM performance_reviews
)
SELECT
    e.employee_id,
    e.first_name,
    e.last_name,
    e.position,
    e.salary,
    lr.rating as latest_performance_rating
FROM employees e
JOIN LatestReviews lr ON e.employee_id = lr.employee_id AND
lr.latest_rev = 1
ORDER BY lr.rating DESC, e.salary DESC;
```

Output :

employee_id	first_name	last_name	position	salary	latest_performance_rating
21	Sachin	Tendulkar	Chief Technology Officer	500000.00	5
24	MS	Dhoni	Chief Financial Officer	475000.00	5
22	Sania	Mirza	Head of Consulting	450000.00	5
25	Saina	Nehwal	Head of Marketing	420000.00	5
23	Virat	Kohli	Chief HR Officer	400000.00	5
26	Abhishek	Bachchan	Head of Data Science	380000.00	5
60	Madhubala	Meena	Finance Director	370000.00	5
62	Nargis	Dutt	Data & AI Director	360000.00	5
58	Raj	Kapoor	Director	350000.00	5
61	Dev	Anand	Marketing Director	330000.00	5
59	Dilip	Kumar	HR Director	320000.00	5
57	Randhir	Kapoor	Principal Architect	300000.00	5
4	Amit	Kumar	Principal Consultant	250000.00	5
54	Hema	Malini	Financial Controller	230000.00	5
52	Neetu	Singh	Senior Manager	220000.00	5
93	KK	Krishnaku...	Software Architect	210000.00	5
56	Shashi	Kapoor	Analytics Lead	210000.00	5
14	Saurabh	Rao	Senior Data Scientist	200000.00	5
75	Kishore	Kumar	Lead Developer	190000.00	5
44	Vidya	Balan	ML Scientist	185000.00	5
2	Rahul	Singh	Team Lead	180000.00	5
50	Parineeti	Chopra	NLP Engineer	175000.00	5
8	Vikram	Yadav	Data Scientist	160000.00	5
9	Aisha	Khan	Software Engineer	95000.00	4
11	Shruti	Shah	HR Business Partner	95000.00	4
95	Kumar	Sanu	HR Business Partner	95000.00	4
68	Sharmila	Tagore	BI Analyst	95000.00	4
31	Katrina	Kaif	Digital Marketer	95000.00	4
6	Sanjay	Gupta	Financial Analyst	90000.00	4
43	Shahid	Kapoor	Content Strategist	90000.00	4
7	Deepika	Jain	Marketing Specialist	85000.00	4
20	Divya	Shinde	Data Analyst	85000.00	4
37	Kareena	Kapoor	Social Media Manager	70000.00	4
88	Loy	Mendonca	Consultant	105000.00	3
48	Varun	Dhawan	Budget Analyst	98000.00	3
49	Arjun	Kapoor	Market Research Analyst	88000.00	3
41	Hrithik	Roshan	HR Generalist	85000.00	3
65	Geeta	Bali	Recruiter	85000.00	3
73	Gulzar	Kumar	Content Creator	80000.00	3
89	Sonu	Nigam	Recruiter	80000.00	3
17	Rajesh	Chandra	Recruiter	80000.00	3
33	Ranbir	Kapoor	Software Developer	80000.00	3
10	Arjun	Reddy	Associate Consultant	75000.00	3
71	Madhuri	Dixit	HR Analyst	75000.00	3
87	Ehsaan	Noorani	IT Analyst	75000.00	3
66	Guru	Dutt	Accountant	75000.00	3

Analysis 3: Project Management & Resource Utilization

Objective: To evaluate the efficiency of project execution and resource planning.

3.1 Project Status and Budget Overview

Purpose: Provides a high-level overview of all projects, their financial scale, timeline, and current status, which is essential for portfolio management.

Query:

```
SELECT
    project_name,
    budget,
    status,
    start_date,
    end_date,
    DATEDIFF(end_date, start_date) AS duration_days
FROM projects
ORDER BY status, budget DESC;
```

Output:

project_name	budget	status	start_date	end_date	duration_days
Starlight System	1800000.00	Planning	2024-01-05	2025-05-15	496
Zeus Cloud	1700000.00	Planning	2024-03-01	2025-09-01	549
Orion Initiative	1100000.00	Planning	2023-04-15	2024-08-20	493
Epsilon Program	1450000.00	Active	2024-02-20	2025-07-30	526
Project Chimera	1300000.00	Active	2023-07-01	2025-01-01	550
Project Voyager	1200000.00	Active	2023-01-10	2024-06-30	537
Project Atlas	1000000.00	Active	2023-08-25	2024-05-20	269
Quantum Leap	850000.00	Active	2023-05-20	2024-12-15	575
Project Echo	650000.00	Active	2023-06-01	2024-04-15	319
Aurora Web App	500000.00	Active	2023-09-01	2024-02-28	180
Titan Migration	2100000.00	Comple...	2022-11-15	2023-08-10	268
Phoenix Platform	1500000.00	Comple...	2022-08-01	2023-11-30	486
Innovate 2.0	950000.00	Comple...	2023-03-10	2024-01-20	316
Nexus CRM	750000.00	Comple...	2022-10-01	2023-09-30	364
Fusion Analytics	900000.00	On Hold	2023-02-01	2024-03-30	423

3.2 Employee Workload Analysis (Hours Assigned)

Purpose: Identifies employees who are over-utilized (burnout risk) and those who are under-utilized, which is crucial for workload balancing and capacity planning.

Query:

```
SELECT
    e.employee_id,
    CONCAT(e.first_name, ' ', e.last_name) AS employee_name,
    e.position,
    SUM(ep.hours_assigned) AS total_hours_assigned
FROM employees e
JOIN employee_projects ep ON e.employee_id = ep.employee_id
GROUP BY e.employee_id
ORDER BY total_hours_assigned DESC;
```

Output:

employee_id	employee_name	position	total_hours_assigned
1	Priya Sharma	Senior Software Engineer	40
44	Vidya Balan	ML Scientist	40
75	Kishore Kumar	Lead Developer	40
50	Parineeti Chopra	NLP Engineer	40
32	Priyanka Chopra	Machine Learning Engineer	40
14	Saurabh Rao	Senior Data Scientist	40
27	Anil Kapoor	IT Architect	40
8	Vikram Yadav	Data Scientist	40
93	KK Krishnakumar	Software Architect	40
99	Bappi Lahiri	Senior DevOps Engineer	35
28	Akshay Kumar	Management Consultant	35
4	Amit Kumar	Principal Consultant	35
39	John Abraham	DevOps Engineer	35
92	Mohit Chauhan	AI Engineer	35
76	Lata Mangeshkar	Senior Consultant	35
9	Aisha Khan	Software Engineer	35
86	Shankar Mahad...	Data Scientist	35
16	Aditya Joshi	Consultant	35
45	Sonam Kapoor	Cybersecurity Analyst	35
20	Divya Shinde	Data Analyst	35
74	R D Burman	Data Engineer	35
80	Jagjit Singh	Data Engineer	30
3	Ananya Patel	Senior Consultant	30
12	Rohit Mishra	Senior Financial Analyst	30
94	Udit Narayan	Senior Consultant	30
84	Vishal Dadlani	Senior Finance Analyst	30
81	Salim Merchant	Software Engineer	30
2	Rahul Singh	Team Lead	25
72	Javed Akhtar	Financial Planner	25
79	Mohammed Rafi	Marketing Analyst	25
7	Deepika Jain	Marketing Specialist	25
82	Sulaiman Merch...	Project Manager	25
87	Ehsaan Noorani	IT Analyst	25
100	Mika Singh	Senior Business Analyst	25
19	Vinay Kumar	Brand Manager	25
90	Shaan Mukherjee	Financial Advisor	25
96	Alka Yagnik	Financial Planner	25
34	Alia Bhatt	Junior Analyst	25
42	Aamir Khan	Senior Financial Advisor	25
48	Varun Dhawan	Budget Analyst	25
63	Sunil Dutt	Senior Developer	25
69	Jeetendra Kapoor	System Analyst	25
78	Mukesh Chandra	Accountant	20
6	Sanjay Gupta	Financial Analyst	20
10	Arjun Reddy	Associate Consultant	20
73	Gulzar Kumar	Content Creator	20

3.3 Cross-Departmental Collaboration on Projects

Purpose: Highlights the most collaborative projects (involving multiple departments) and those that are siloed, reflecting on the company's culture of teamwork.

Query:

```
SELECT
    p.project_id,
    p.project_name,
    COUNT(DISTINCT e.department_id) AS
number_of_departments_involved,
    GROUP_CONCAT(DISTINCT d.department_name) AS departments
FROM projects p
JOIN employee_projects ep ON p.project_id = ep.project_id
JOIN employees e ON ep.employee_id = e.employee_id
JOIN departments d ON e.department_id = d.department_id
GROUP BY p.project_id
ORDER BY number_of_departments_involved DESC;
```

Output:

project_id	project_name	number_of_departments_involved	departments
3	Phoenix Platform	3	Consulting,Data & AI,Human Resources
4	Fusion Analytics	3	Finance,Human Resources,IT Services
5	Orion Initiative	3	Consulting,Finance,Marketing
6	Nexus CRM	3	Data & AI,Human Resources,Marketing
7	Project Chimera	3	Data & AI,Finance,IT Services
8	Aurora Web App	3	Consulting,IT Services,Marketing
9	Starlight System	3	Consulting,Data & AI,Human Resources
10	Innovate 2.0	3	Finance,Human Resources,IT Services
11	Epsilon Program	3	Consulting,Finance,Marketing
12	Project Echo	3	Data & AI,Human Resources,Marketing
13	Titan Migration	3	Data & AI,Finance,IT Services
1	Project Voyager	2	Finance,IT Services
2	Quantum Leap	2	Consulting,Marketing
14	Zeus Cloud	2	Consulting,Marketing
15	Project Atlas	2	Data & AI,Human Resources

Analysis 4: Historical Trends & Tenure Analysis

Objective: To understand company growth, hiring trends, and the composition of the workforce over time.

4.1 Hiring Trends Over the Years

Purpose: Shows how the company's hiring rate has changed year-over-year, indicating periods of growth or stagnation.

Query:

```
SELECT
    YEAR(hire_date) AS hire_year,
    COUNT(employee_id) AS employees_hired
FROM employees
GROUP BY YEAR(hire_date)
ORDER BY hire_year;
```

Output:

hire_year	employees_hired
2000	1
2001	1
2002	1
2003	1
2004	1
2005	1
2006	1
2007	1
2008	1
2009	1
2010	2
2011	2
2012	2
2013	2
2014	2
2015	2
2016	3
2017	4
2018	5
2019	6
2020	6
2021	6
2022	8

4.2 Count of Employees by Tenure Group

Purpose: Query that counts how many employees fall into each tenure bucket. This shows if the company has more new or experienced staff.

Query:

```
SELECT
    CASE
        WHEN DATEDIFF(CURDATE(), hire_date) / 365 < 2 THEN
'New Hire (0-2 years)'
        WHEN DATEDIFF(CURDATE(), hire_date) / 365 BETWEEN 2
AND 5 THEN 'Mid-Tenure (2-5 years)'
        WHEN DATEDIFF(CURDATE(), hire_date) / 365 > 5 THEN
'Experienced (5+ years)'
    END AS tenure_group,
    COUNT(*) AS number_of_employees
FROM employees
GROUP BY tenure_group
ORDER BY number_of_employees DESC;
```

Output :

tenure_group	number_of_employees
Experienced (5+ years)	84
Mid-Tenure (2-5 years)	16

4.3 Department with the Most Experienced Employees (Highest Average Tenure)

Purpose: This query reveals which department has the most long-serving, experienced employees on average. A high average tenure suggests stability and institutional knowledge.

Query:

```
SELECT
    d.department_name,
    ROUND(AVG(DATEDIFF(CURDATE(), e.hire_date) / 365), 1) AS
average_tenure_years
FROM employees e
JOIN departments d ON e.department_id = d.department_id
GROUP BY d.department_name
ORDER BY average_tenure_years DESC;
```

Output:

department_name	average_tenure_years
Data & AI	24.9
Marketing	24.4
Consulting	24.1
IT Services	23.6
Finance	23.6
Human Resources	23.5

Conclusion

This comprehensive analysis of the Employee Management System provides a clear, data-driven snapshot of the organization's operational health. The insights derived from the four key areas—Departmental Efficiency, Workforce Performance, Project Management, and Historical Trends—collectively highlight both strengths and critical areas for improvement.

The data confirms that the company has a solid foundation with experienced staff in key departments and successful project completions. However, it also reveals significant risks that require immediate attention, such as potential employee burnout due to uneven workload distribution, the high risk of losing top talent who are underpaid, and concerning imbalances in departmental budget allocation.

The power of this analysis lies in its ability to transform raw data into actionable strategy. It moves beyond simple observation to provide a roadmap for leadership. By implementing the targeted recommendations outlined in this report, the organization can proactively address these risks, foster a more equitable and rewarding work environment, and ultimately build a more resilient, efficient, and successful operation for the future.

This project underscores the critical importance of a centralized data system for making informed, strategic decisions that drive growth and stability.