Documentazione Progetto

Table of Contents

Requirements

Requirements Analysis

Choose the right level of abstraction

Customer information:
Contact details:
Order history:
Specialized personnel: employee
Number of members: employee

Operations: orders

Linearize phrases and break down those articulated

Glossary of terms (sinonimi in tabella)

Term	Description	Synonyms	Connections
Operational Center			Team
Order			Customer, Business Account, Team
Business Account			Customer, Order
Team			Operational Center, Order, Employee
Customer			Order, Business Account
Employee			Team

Reorganize sentences for specific concepts

General Phrases

We want to create a database that manages decentralized logistics operations through several operational centers, storing information about orders, teams and customers. The company offers customized warehouse management services, including long-term storage and expedited shipping.

Phrases related to operational centers

Operational centers are distributed across regions, each responsible for handling local storage and shipments.
For each operational center we will hold name, address, city/province, and number of employees.
Operational centers have management teams.

Phrases related to orders

Orders can be placed by customers via phone, email, or directly through the company's online platform.
For each order we will hold type, date, cost, and customer information.
Every order is associated with a single business account.
Orders can be of three types: regular, urgent, or bulk (large quantities).

Phrases related to business account

Each business account will be identified by a unique code.
Each customer may have one or more business accounts.
Every order is associated with a single business account.

Phrases related to teams

For each team we will identify them via unique code, and we will hold name and number of operations handled.
Teams consist of specialized personnel, and the number of members may vary depending on the required workload.
The company maintains a performance evaluation system that assigns a score to each team based on delivery times and customer feedback.

Phrases related to customers

Each customer may have one or more business accounts.
Customers can be classified as individual or business, each identified by a unique alphanumeric code, with contact details and order history.

Phrases related to employees

Teams consist of specialized personnel, and the number of members may vary depending on the required workload.

Skeleton Schema

ALLEGARE SKELETON SCHEMA

Restructured Schema

ALLEGARE SCHEMA RISTRUTTURATO

Business Rules

- Employees linked to an order must be in the same team and the team must be the team related to the same order.
- Number of employees...
- Number of operations...
- Completion date cannot be before placing date
- PerformanceScore is computed...
- A team has a maximum of 8 members
- OrderType must be of three types: regular, urgent, or bulk
- Feedback of CompletedOrder must be ...

Logical Design

Volumes Table

Assuming a temporal space of x years:

Concept	Type	Volume
Operational Center	E	15 (*assuming 10 team per Operational Center*)
Linked To	R	150 (same as Team)
Team	E	150 (*given*)
Handled By	R	45000 (same as (assigned) Order)
Order	E	x yrs · (300 op/m · 150 team · 12 months **DA FARE**) + 100 not assigned = 45100
Belongs To	R	150 team · 6,3 current employees ~= 950
Employee	E	80% of (150 · 8 (*given*)) + 140 past employees = 1100 (~6,3 current employees per team)
Manages	R	45000 (active) orders · 3 = 135000 (*assuming 3 employees working on an order*)
Places	R	45100 (same as Orders)
Business Account	E	45100 orders / 1.5 orders/m ~= 30000 (*assuming 1.5 orders per business account* $\rightarrow$ *orders per customer*)
Have	R	30000 (same as Business Account)
Customer	E	$\frac{30000 \text{ business account}}{1.5 \text{ business account/c}}$ ~= 20000

Concept	Type	Volume
Active Order	E	20% of 45000 (assigned) orders + 100 not assigned = 9100
Completed Order	E	80% of 45000 (assigned) orders = 36000
Individual	E	90% of Customer = 18000
Business	E	10% of Customer = 2000

Operations Analysis

Operation	Type	Frequency
Operation 1	I	10/day
Operation 2	I	1000/day
Operation 3	I	500/day
Operation 4	I	200/day
Operation 5	I	20/day

In the next sections we will double count the cost of writing operations.

Operation 1

Register a new customer

Concept	Type	No. Access	Access Type
Customer	E	1	W
Have	R	1	W
Business Account	E	1	W

Operation cost: 6 accesses · 10 days = 60 accesses/day

Operation 2

Add a new order

Concept	Type	No. Access	Access Type
Order	E	1	W
Places	R	1	W

Operation cost: 4 accesses · 1000 days = 4000 accesses/day

Operation 3

Assign an order to a management team

- Access without redundancy *Team.NoOperations*

Concept	Type	No. Access	Access Type
Handled By	R	1	W
Manages	R	3	W

- Access with redundancy *Team.NoOperations*

Concept	Type	No. Access	Access Type
Handled By	R	1	W
Team	E	1	R
Team	E	1	W
Manages	R	3	W

Operation cost (without redundancy): 8 accesses · 500 days = 4000 accesses/day
Operation cost (with redundancy): 11 accesses · 500 days = 5500 accesses/day

Operation 4

View the total number of operations handled by a specific team

- Access with redundancy *Team.NoOperations*

Concept	Type	No. Access	Access Type
Team	E	1	R

- Access without redundancy *Team.NoOperations*

Concept	Type	No. Access	Access Type
Team	E	1	R
Handled By	R	300	R

Operation cost (with redundancy): 1 access · 200 days = 200 access/day
Operation cost (without redundancy): 301 accesses · 200 days = 60200 accesses/day

Operation 5

Print a list of teams sorted by their performance score

- Access with redundancy *Team.PerformanceScore*

Concept	Type	No. Access	Access Type
Team	E	150	R

- Access without redundancy *Team.PerformanceScore*

Concept	Type	No. Access	Access Type
Team	E	150	R
Handled By	R	45000	R
Order	E	45000	R

Operation cost (with redundancy): 150 accesses · 20 days = 3000 accesses/day
Operation cost (without redundancy): 90150 accesses · 20 days = 1803000 accesses/day

Redundancy Analysis

- *OperationalCenter.NoEmployees*: given that there are no operations that involve this attribute, so we decide to **eliminate** the redundancy.
- *Team.NoOperations*: with the redundancy, we have 4200 accesses combining both Op. (3) and (4); on the other hand, without the redundancy, we have 65700 accesses. In the end, we decide to **maintain** the redundancy.
- *Team.PerformanceScore*: with the redundancy, we have 3000 accesses on Op. (5); on the other hand, without the redundancy, we have 1803000

accesses. In the end, we decide to **maintain** the redundancy.