Projeto de BD - Parte 2

Grupo 5

Turno L06

Prof. João Tomás Brazão Caldeira
Prof. Pedro Manuel Moreira Vaz Antunes de Sousa

Aluno	**Esforço (horas)**	**Esforço Relativo**
Fábio André Soares Nunes Sobrinho (103473)	6 horas	33%
Tomás dos Santos Taborda (103641)	6 horas	33%
José Maria de Lacerda Thermudo Gallego (103726)	6 horas	33%

Modelo Relacional

customer(<u>cust_no</u>, name, email, phone, address)

- unique(email)

order(<u>order_no</u>, date, cust_no)

- cust_no: FK(customer.cust_no)
- IC-1: Every order (order_no) must participate in the contains association

sale(<u>order_no</u>)

- order_no: FK(order.order_no)

product(<u>sku</u>, name, description, price)

- IC-2: Every product (sku) must participate in the supply entity
- ($price$>0): a product's price must always be positive

ean_product(<u>sku</u>, ean)

- sku: FK(product.sku)

supplier(<u>TIN</u>, name, address, sku, date)

- sku: FK(product.sku)

employee(<u>ssn</u>, TIN, bdate, name)

- unique(TIN)
- IC-3: Every employee (ssn) must participate in the works association

department(<u>name</u>)

workplace(<u>address</u>, lat, long)

- unique(lat, long)

office(<u>address</u>)

- address: FK(workplace.address)

warehouse(<u>address</u>)

- address: FK(workplace.address)

pay(<u>order_no</u>, cust_no)

- order_no: FK(sale.order_no)
- cust_no: FK(customer.cust_no)

contains(<u>order_no</u>, <u>sku</u>, qty)

- order_no: FK(order.order_no)
- sku: FK(product.sku)

process(<u>order_no</u>, <u>ssn</u>)

- order_no: FK(order.order_no)
- ssn: FK(employee.ssn)

works(<u>ssn</u>, <u>name</u>, <u>address</u>)

- ssn: FK(employee.ssn)
- name: FK(department.name)
- address: FK(workplace.address)

delivery(<u>address</u>, <u>TIN</u>)

- address: FK(warehouse.address)
- TIN: FK(supply.TIN)

As restrições de integridade do modelo Entidade-Associação que não são passíveis de conversão para o modelo relacional são:

- (IC-1) Customers can only pay for the Sale of an Order they have placed themselves

Álgebra Relacional

1) $\Pi_{name}(\sigma_{date>\text{"31-12-2022"} \ \wedge \ date<\text{"1-1-2024"} \ \wedge \ price>50}$
   $(customer \bowtie order \bowtie contains \bowtie \rho_{name \mapsto nameprod}(product)))$

2) $A \leftarrow \sigma_{date>\text{"31-12-2022"} \ \wedge \ date<\text{"1-2-2023"}}(order \bowtie process \bowtie employee)$
   $\Pi_{name}(A \bowtie \rho_{name \mapsto namework}(works) \bowtie (warehouse - office))$

3) $A \leftarrow \rho_{(2 \mapsto qty)}({}_{sku}G_{SUM(qty)}(contains \bowtie sale))$
   $B \leftarrow \rho_{(1 \mapsto max)}(G_{MAX(qty)}(A))$
   $\Pi_{name}(\sigma_{qty=max}(product \bowtie A \times B))$

4) ${}_{order\_no}G_{SUM(total\_value)}(\Pi_{order\_no, price \times qty \mapsto total\_value}(sale \bowtie contains \bowtie product))$