

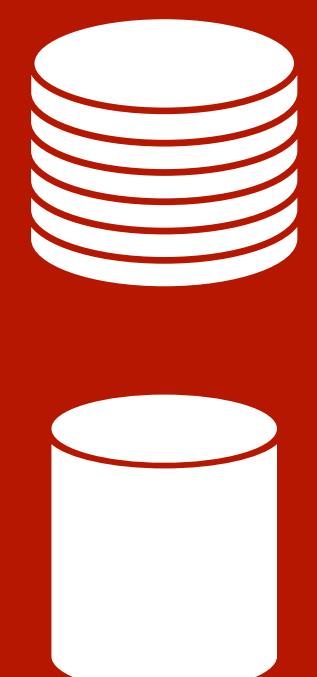
# DESIGNING DATA-INTENSIVE APPLICATIONS



# THE DATA MODEL

**WHY IT IS THE MOST IMPORTANT PART OF DEVELOPING A SOFTWARE?**

**WHAT IS THE DATA MODEL?**



LAYER 0

PEOPLE

ORDERS

ACTIONS

COMPANIES

LAYER 1

DATA STRUCTURE

OBJECTS

LAYER 2

JSON

XML

TABLES

GRAPHS

LAYER 3

BYTES IN RAM

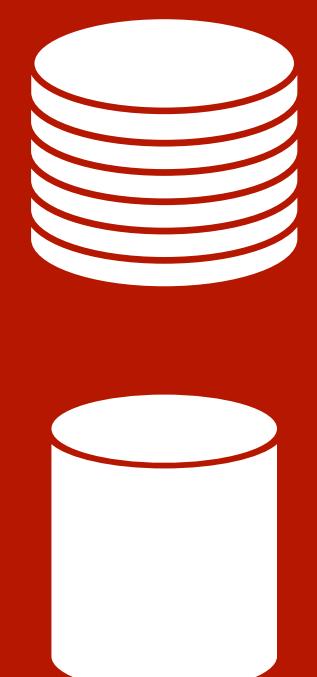
FILES ON DISK

LAYER 4

E-CURRENTS

MAGNETIC FIELDS

LIGHT PULSES

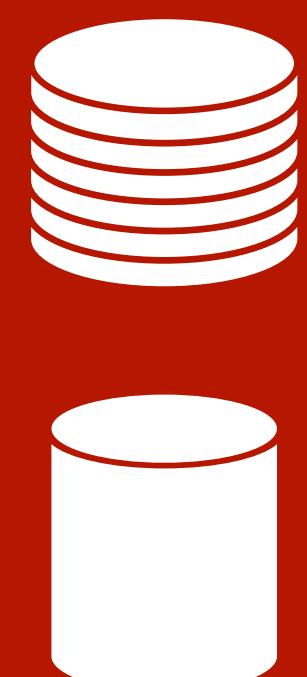


# SQL

RELATIONS  TABLES [ ROWS - COLUMNS ]

BUSINESS DATA PROCESSING

TRANSACTIONAL / BATCH PROCESSING

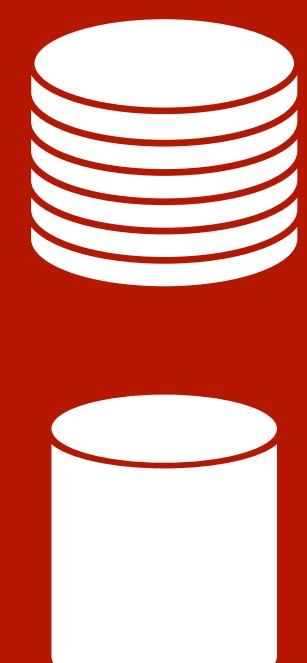


# WHAT IS TRANSACTIONAL PROCESSING?

```
irb(main):010:0> User.last.transactions.create
  User Load (0.7ms)  SELECT "users".* FROM "users" ORDER BY "users"."id" DESC LIMIT $1  [["LIMIT", 1]]
TRANSACTION (0.2ms)  BEGIN
  Transaction Create (0.5ms)  INSERT INTO "transactions" ("user_id", "created_at", "updated_at") VALUES ($1, $2
"  [{"user_id": 1}, {"created_at": "2021-11-05 12:54:19.335845"}, {"updated_at": "2021-11-05 12:54:19.335845"}]
TRANSACTION (1.2ms)  COMMIT
```



```
User Load (0.2ms)  SELECT "users".* FROM "users" WHERE "users"."email" IS NULL ORDER BY
User Load (0.1ms)  SELECT "users".* FROM "users" WHERE "users"."provider" = ? AND "user
"provider", "facebook"], [{"uid": "10210766866867348"}], ["LIMIT", 1]]
(0.1ms) begin transaction
(0.0ms) rollback transaction
```





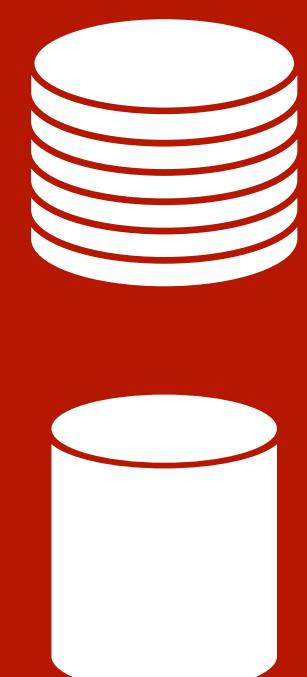
# NO-SQL

FIX RELATIONAL DATABASES SCALING ISSUES

NEW MODEL DISTRIBUTED / SHARED BY DEFAULT

SCHEMA  SCHEMA-LESS

WEAK SUPPORT FOR SOME TYPES QUERIES IN SQL DBS





## Ahmed Shaaban

Senior Backend Engineer at Sopra Banking Software

Berlin, Berlin, Germany · [Contact info](#)

2,407 followers · 500+ connections

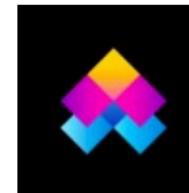


Sopra Banking Software



faculty of engineering  
mansoura

## Experience



### Senior Software Engineer (Backend)

Sopra Banking Software · Full-time

Apr 2021 - Present · 1 yr 2 mos

Berlin, Germany

Implement solutions and deliver high-quality software based on Ruby, Ruby on Rails, Kotlin and Spring.  
...see more



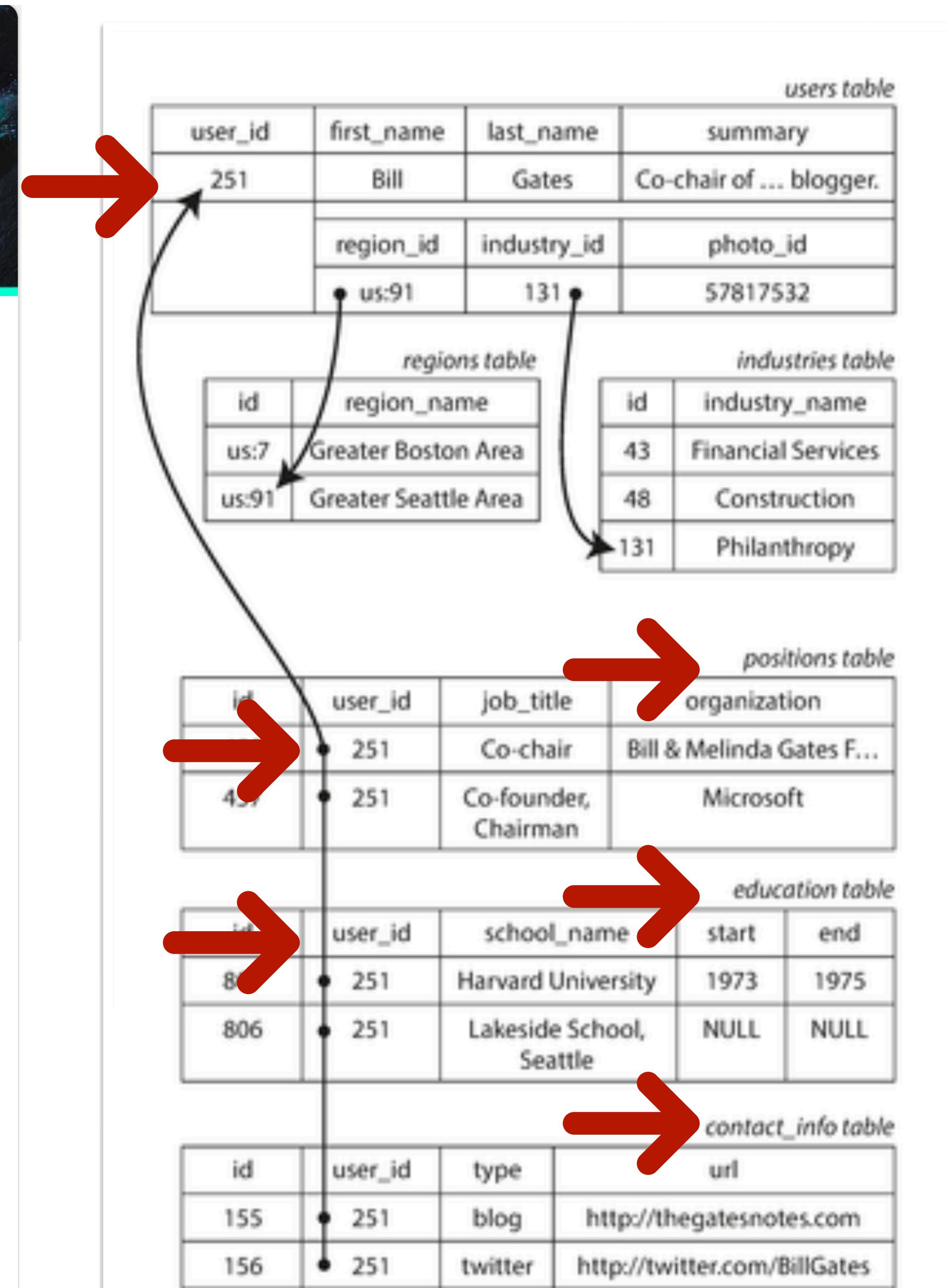
### Senior Backend Ruby Developer

VAHA · Full-time

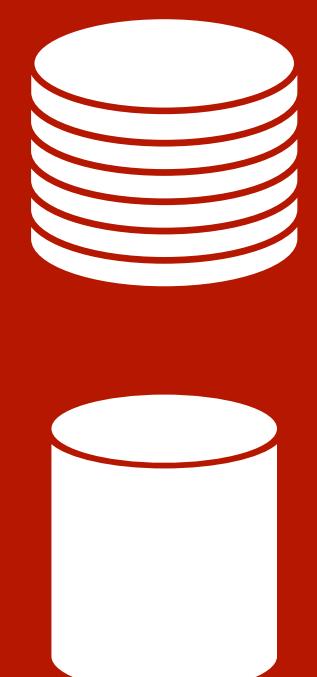
Jul 2019 - Mar 2021 · 1 yr 9 mos

Berlin, Germany

Design and improve our architecture with the Backend team.  
Research technologies and engineer complete solutions to problems.  
...see more



```
{  
    "user_id": 251,  
    "first_name": "Bill",  
    "last_name": "Gates",  
    "summary": "Co-chair of the Bill & Melinda Gates... Active  
blogger.",  
    "region_id": "us:91",  
    "industry_id": 131,  
    "photo_url": "/p/7/000/253/05b/308dd6e.jpg",  
    "positions": [  
        {"job_title": "Co-chair", "organization": "Bill & Melinda  
Gates Foundation"},  
        {"job_title": "Co-founder, Chairman", "organization":  
"Microsoft"}  
    ],  
    "education": [  
        {"school_name": "Harvard University", "start": 1973,  
"end": 1975},  
        {"school_name": "Lakeside School, Seattle", "start": null,  
"end": null}  
    ],  
    "contact_info": {  
        "blog": "http://thegatesnotes.com",  
        "twitter": "http://twitter.com/BillGates"  
    }  
}
```



LOCALITY??!



MANY TO MANY??!

# ARE DOCUMENT DATABASES REPEATING HISTORY?

