

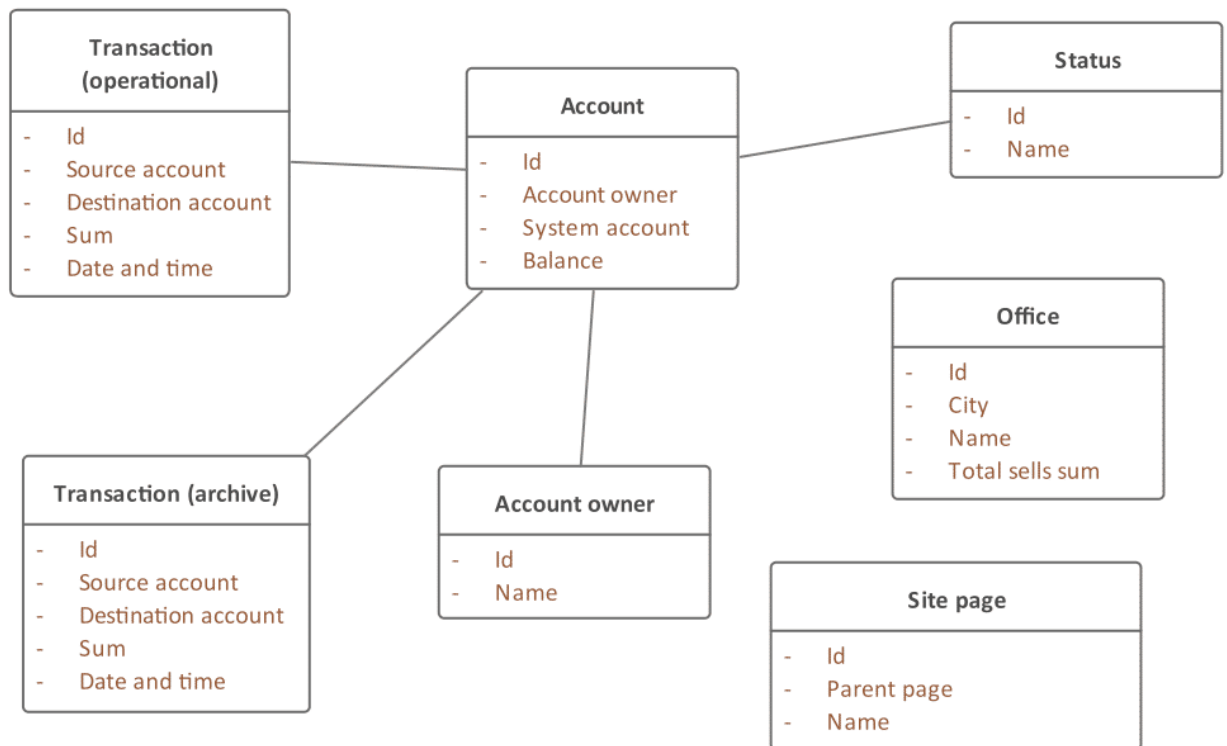
Analyze the “Bank” database model (see below). Perform the following tasks:

1. What attributes are missing from existing relations? Add those missing attributes.
 2. What relations are missing from the database? Add those relations.
 3. Do all objects in the database follow unified naming conventions? Correct those violating the convention.
 4. Do all attributes in the database have optimal data types? Propose optimization.
 5. Do all relations in the database have optimal keys? If no, propose optimization.
 6. Are there redundant or missing relationships in the database? Make necessary corrections.
 7. What cascade operations are necessary in this database? Make a list.
 8. Can we increase performance using caching relations? If yes, add such relations.
 9. What indexes are missing from the database? Add all necessary indexes.
 10. Update logical models in “CTECH DB 02 - Relations, Keys, Relationships, Indexes - task.eap” file, export your final models as SQL scripts and import in a real DBMSes (MS SQL Server and Oracle).
-

This is an extremely simplified database model for some imaginary bank. It contains only basic elements. There are some intentionally made mistakes, so it is your task to find and correct them.

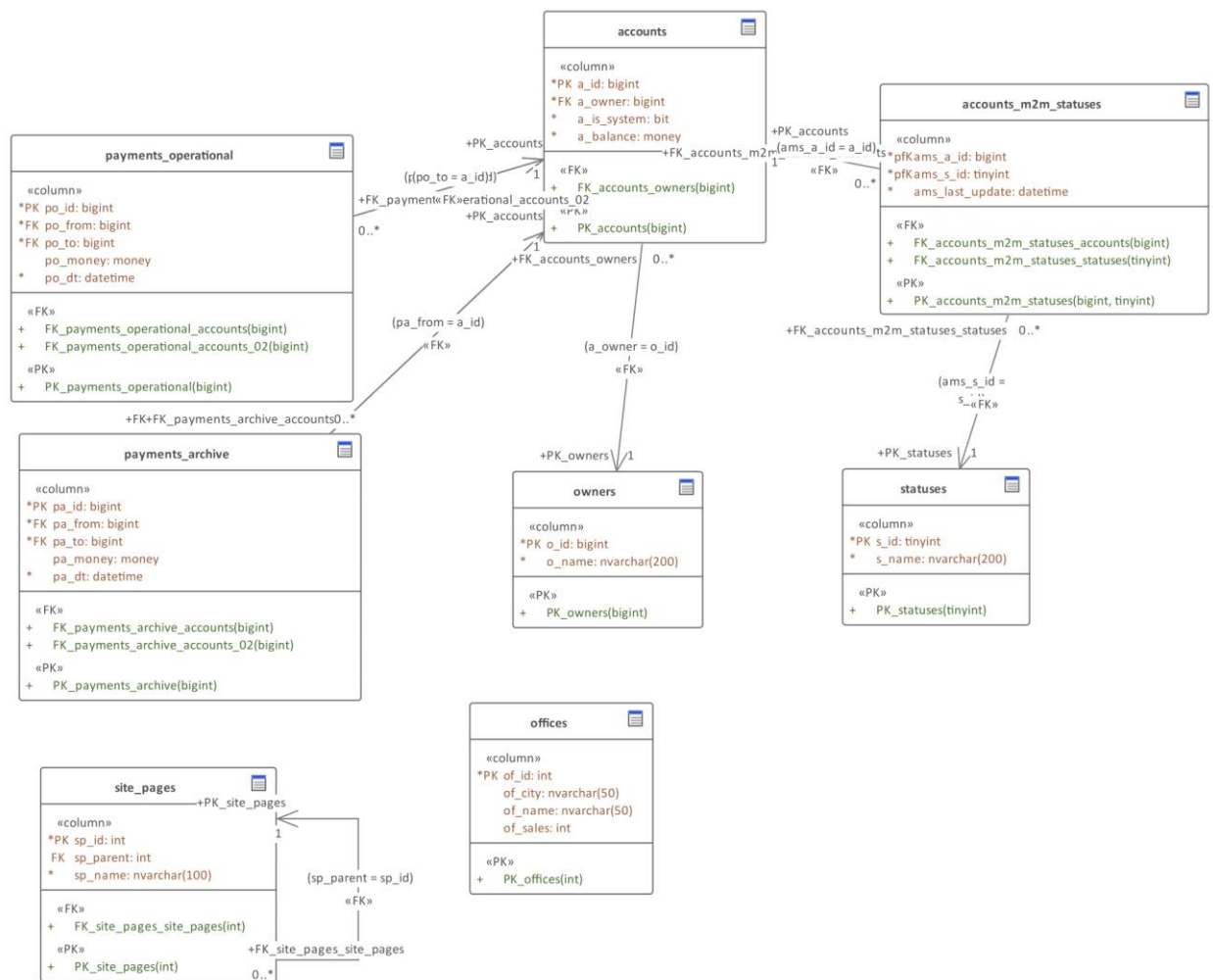
The database represents the following entities and attributes (see Picture A or “Conceptual Model” in “CTECH DB 02 - Relations, Keys, Relationships, Indexes - task.eap”):

- Account (describes an account):
 - id (account id);
 - balance (account balance, MONEY data type);
 - account owner (FK);
 - system account (a flag representing that this account does not belong to a human).
- Status (account status, e.g., «Active», «Locked» и т.д.):
 - id (status id);
 - name (status name).
- Transaction operational (for transactions in the current month):
 - id (transaction id);
 - source account (FK);
 - destination account (FK);
 - date and time (transaction datetime);
 - sum (transaction total sum).
- Transaction archive (for transactions before the current month):
 - id (transaction id);
 - source account (FK);
 - destination account (FK);
 - date and time (transaction datetime);
 - sum (transaction total sum).
- Account owner (bank client):
 - id (account owner id);
 - name (account owner name).
- Site page (bank website page):
 - id (page id);
 - parent page (rFK);
 - name (page name).
- Office (bank office):
 - id (office id);
 - city (office location);
 - name (office name);
 - total sells sum (MONEY datatype, sum of profit by the office).

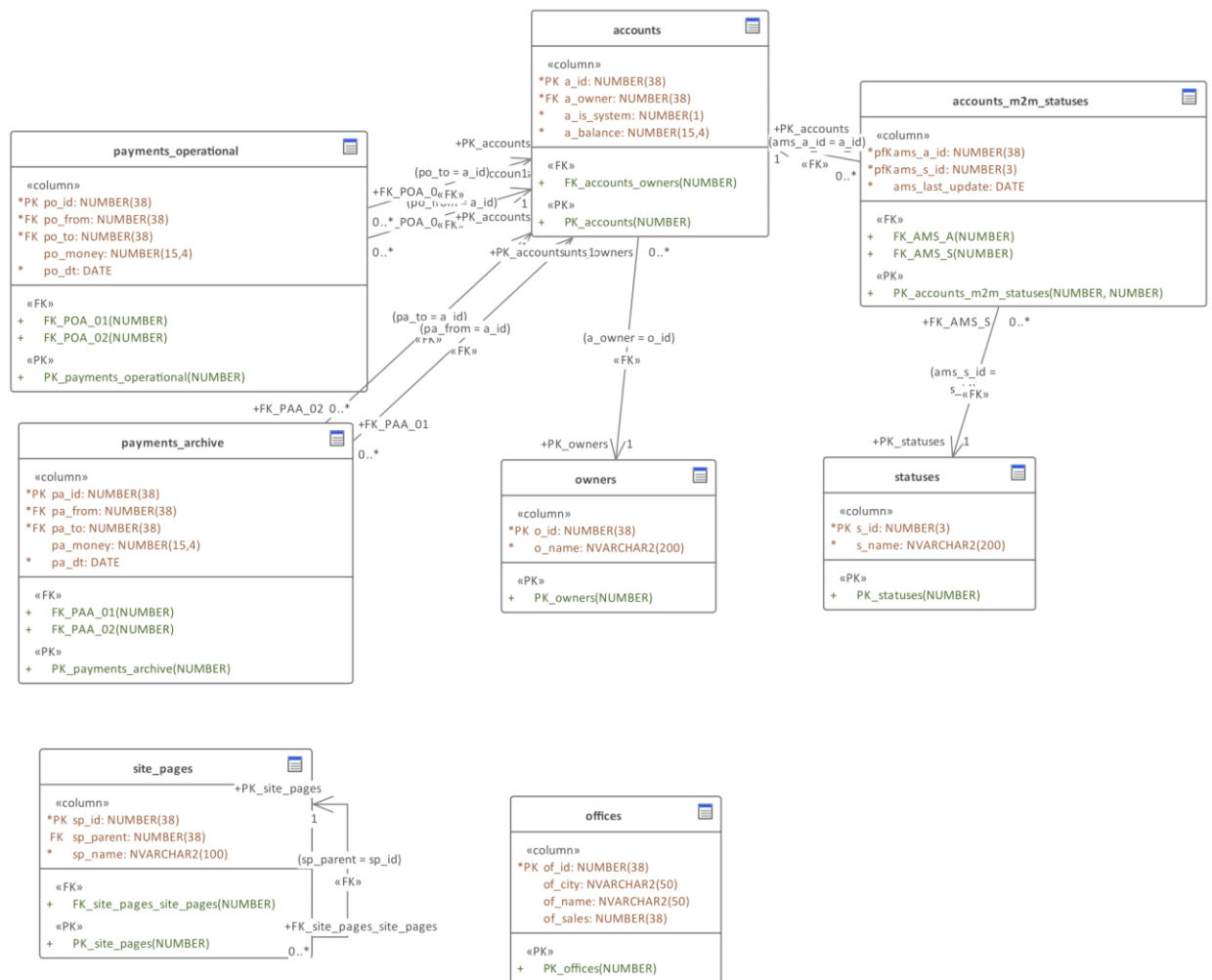


Picture A – “Conceptual Model”

The datalogical level of the database looks like this (see Picture B and Picture C or “Datalogical Model” in “CTECH DB 02 - Relations, Keys, Relationships, Indexes - task.eap”):



Picture B – “Datological Model” for MS SQL Server



Picture C – “Datalogical Model” for Oracle