Data And Applications

Project Phase 3

Team No. - 57

CONVERSION OF ER DIAGRAM FOR OUR MINI – WORLD "BANKING SYSTEM" TO RELATIONAL MODEL

In continuation of our work in phase 2 during which we had drawn ER diagram for our Mini World "Banking System" using draw.io software, we have converted our ER diagram for our mini world to relational model and drawn the relational diagram using draw.io. The procedure/ methodology adopted and the assumptions made while drawing the relational diagram are mentioned below : --

1. For Six Entities viz. "BANK; BANK BRANCH (WEAK ENTITY); LOAN; ACCOUNT DETAILS; CUSTOMER and NOMINEE (WEAK ENTITY)" in the ER model, six tables have been drawn in the relational diagram as per procedure mentioned in the text book under section 9.1.1 - step 1 and 2.

2. 1:1 and 1:N binary relationships mappings viz. "HAS BRANCHES IN; OFFERS; AVAILED BY and NOMINATES", " Foreign Key approach"described in the text book under section 9.1.1 - step 3 and 4 has been adopted.

3. For M:N binary relationship mapping between entities "ACCOUNT DETAILS and CUSTOMER" , a separate table has been drawn in the relational diagram as per procedure mentioned in the text book under section 9.1.1 - step 5.

4. For relationship with degree >=3, separate table has been drawn in the relational diagram as per procedure mentioned in the text book under section 9.1.1 - step 7.

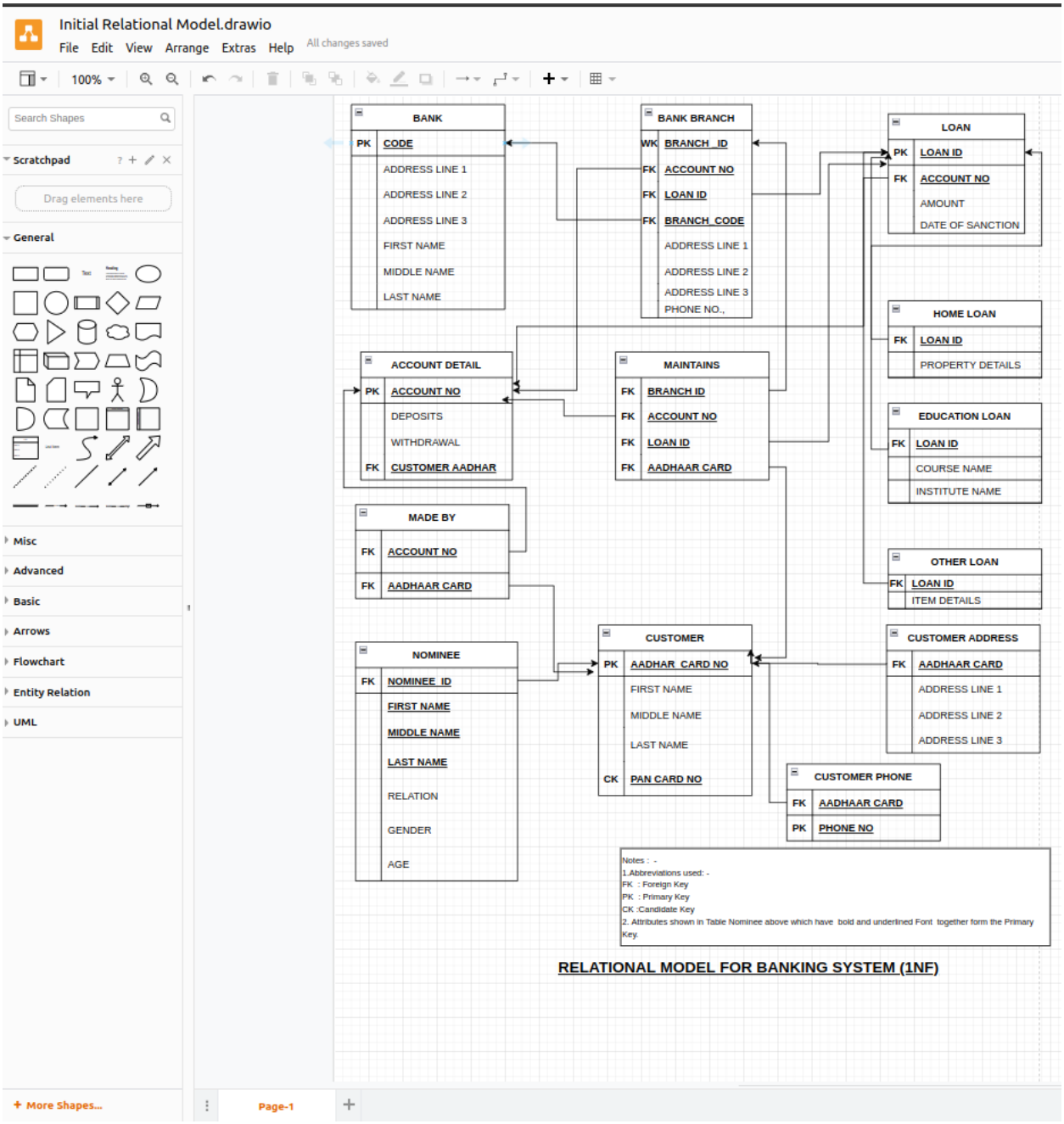
5. For Multi-valued attributes viz. "ADDRESS and PHONE NO" UNDER ENTITY "CUSTOMER", two tables have been drawn in the relational diagram as per procedure mentioned in the text book under section 9.1.1 - step 6. However, keeping in view the clarity requirement of the diagram, attribute "Phone no" of the

entity “Bank Branch” has been assumed now as single valued and accordingly, a separate table for the same has not been drawn.

6. For three Sub-Classes viz. “ HOME LOAN; EDUCATION LOAN and OTHER LOAN” under entity “LOAN”, three tables have been drawn in the relational diagram as per procedure mentioned in the text book under section 9.2.1 (option 8 A). In all of these 3 Tables, Loan ID (which is the foreign key in these Tables) is the Primary Key.

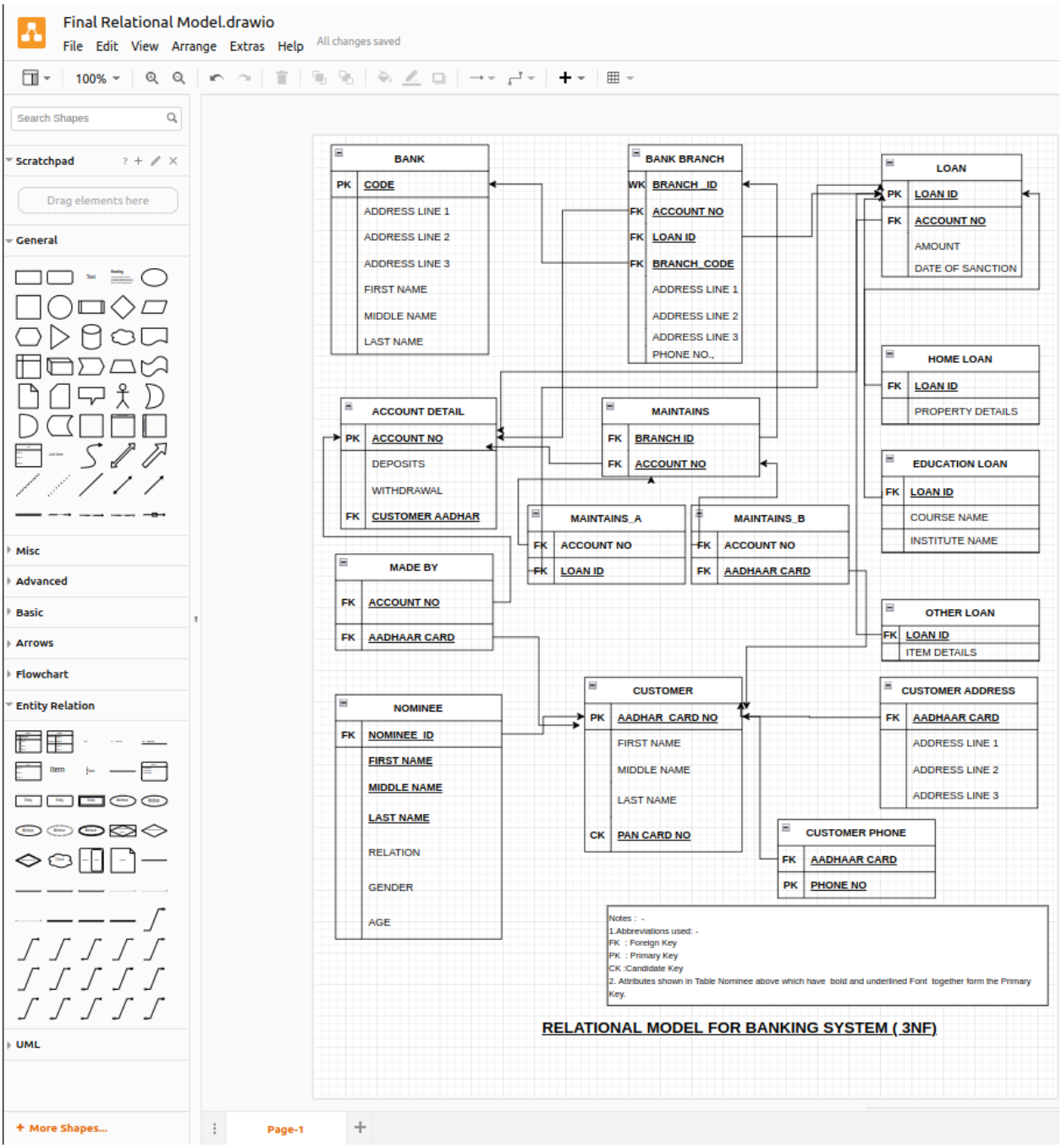
7. Derived Attribute “Balance” under entity “Account Details” has not been included in the table “ACCOUNT DETAILS” in the relational diagram as per the procedure.

8. Relational diagram as drawn using draw.io software is attached which is in first normal form as separate tables for Multi-valued attributes have already been drawn.



Since the Table “MAINTAINS” contains Partial Dependencies, we have to further Normalize it into 2nd Normal and 3rd Normal Forms. Accordingly, to remove Partial Dependency, the above Table has been divided in 3 Tables, namely “MAINTAINS”, “MAINTAINS_A”, “MAINTAINS_B” and the resulting Relational Diagram drawn using draw.io is attached. The above

diagram is now Normalized to 3rd Normal Form also as there are no Transitive Dependencies in the resulting Relational Diagram.


Final Relational Model.drawio
File Edit View Arrange Extras Help
All changes saved
100%
Search Shapes
Scratchpad
Drag elements here
General
Misc
Advanced
Basic
Arrows
Flowchart
Entity Relation
UML
+ More Shapes...
Page-1
BANK
PK CODE
ADDRESS LINE 1
ADDRESS LINE 2
ADDRESS LINE 3
FIRST NAME
MIDDLE NAME
LAST NAME
BANK BRANCH
WK BRANCH_ID
FK ACCOUNT NO
FK LOAN ID
FK BRANCH_CODE
ADDRESS LINE 1
ADDRESS LINE 2
ADDRESS LINE 3
PHONE NO.,
LOAN
PK LOAN ID
FK ACCOUNT NO
AMOUNT
DATE OF SANCTION
HOME LOAN
FK LOAN ID
PROPERTY DETAILS
EDUCATION LOAN
FK LOAN ID
COURSE NAME
INSTITUTE NAME
ACCOUNT DETAIL
PK ACCOUNT NO
DEPOSITS
WITHDRAWAL
FK CUSTOMER AADHAR
MAINTAINS
FK BRANCH ID
FK ACCOUNT NO
MAINTAINS_A
FK ACCOUNT NO
FK LOAN ID
MAINTAINS_B
FK ACCOUNT NO
FK AADHAAR CARD
MADE BY
FK ACCOUNT NO
FK AADHAAR CARD
OTHER LOAN
FK LOAN ID
ITEM DETAILS
CUSTOMER
PK AADHAR_CARD NO
FIRST NAME
MIDDLE NAME
LAST NAME
CK PAN CARD NO
CUSTOMER ADDRESS
FK AADHAAR CARD
ADDRESS LINE 1
ADDRESS LINE 2
ADDRESS LINE 3
NOMINEE
FK NOMINEE_ID
FIRST NAME
MIDDLE NAME
LAST NAME
RELATION
GENDER
AGE
CUSTOMER PHONE
FK AADHAAR CARD
PK PHONE NO
Notes : -
1.Abbreviations used: -
FK : Foreign Key
PK : Primary Key
CK :Candidate Key
2. Attributes shown in Table Nominee above which have bold and underlined Font together form the Primary Key.
RELATIONAL MODEL FOR BANKING SYSTEM (3NF)

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