

Phase 3

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After mapping ER to relational model

This is a direct conversion from the ER model to relational model without any significant changes.

Employee	
id	int
name_composite	varchar
phone	int
email	varchar
dob	date
joining_date	date
salary	date
emp_pos	varchar
emp_status	varchar
hotel_id_multivalued	int
manager_id	int
is_service_staff	boolean
is_supervisor	boolean
is_hotel_manager	boolean
service_staff_id	int
service_staff_division	varchar
supervisor_id	int
supervisor_dept	varchar
hotel_manager	hotel_id

`is_service_staff`, `is_supervisor`, `is_hotel_manager` are Booleans that determine the subclasses of the ER model.

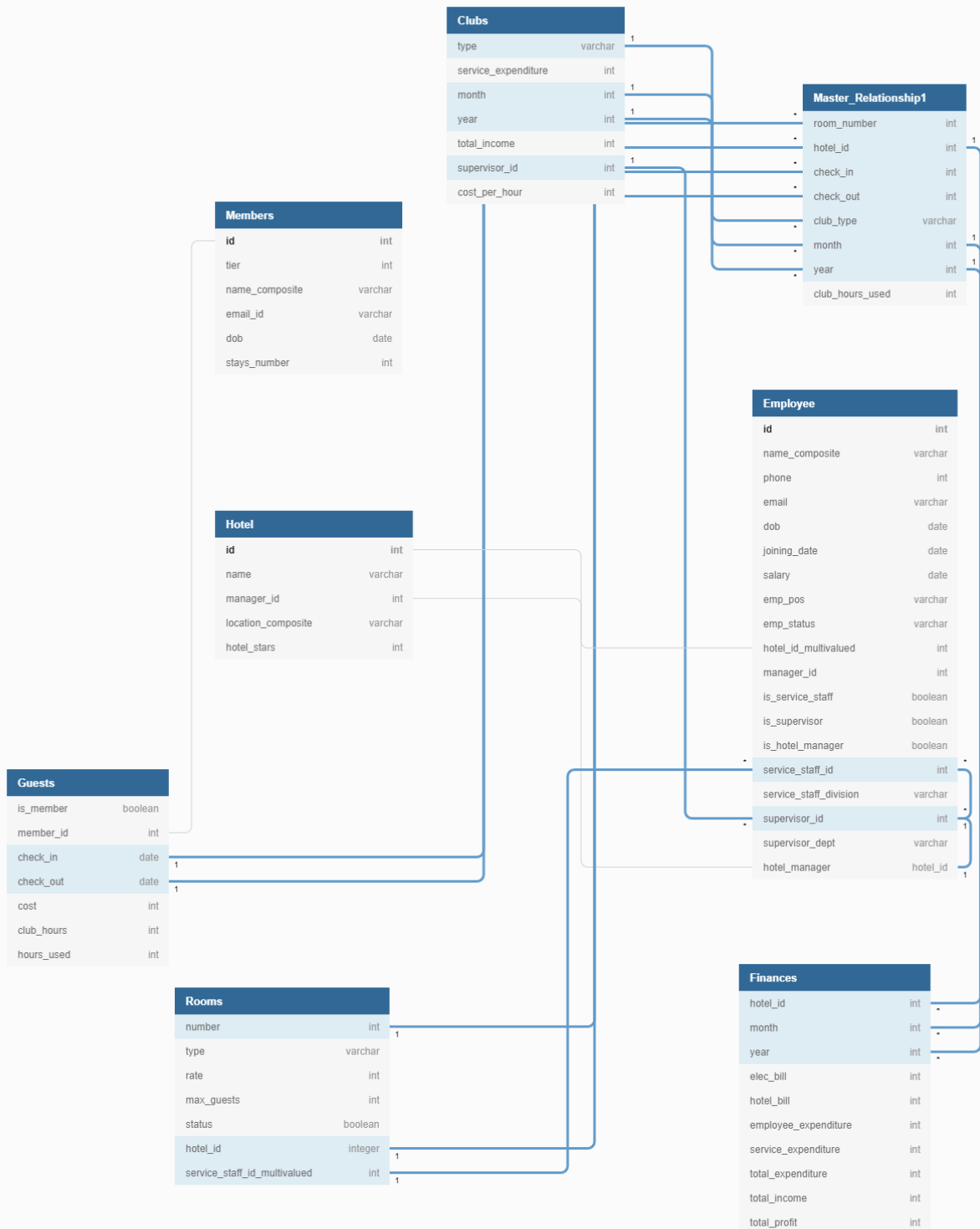
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Addition of a new relation **Master_Relationship1** is necessary to model the 5-ary relationship depicted in the ER diagram from phase 2.

Master_Relationship1		
room_number	int	
hotel_id	int	1
check_in	int	
check_out	int	
club_type	varchar	
month	int	1
year	int	1
club_hours_used	int	

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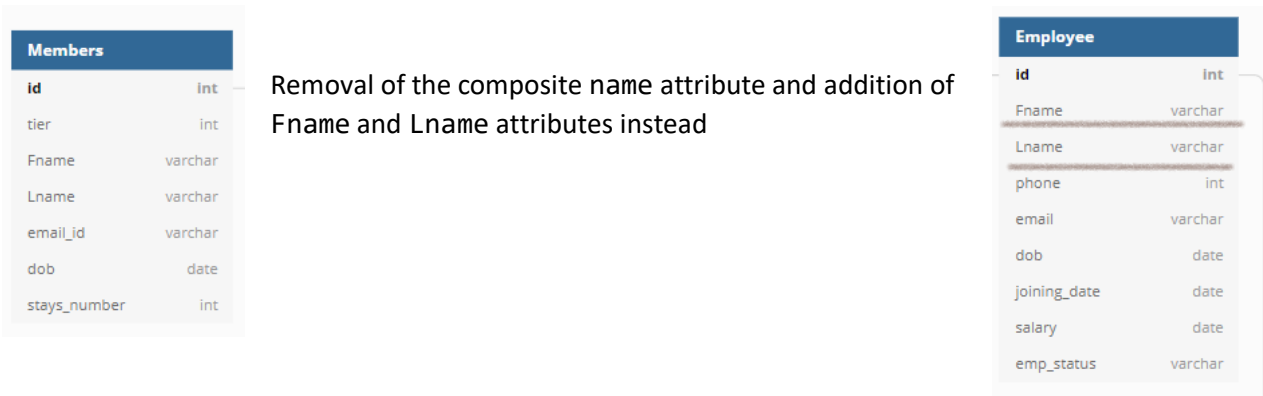
Snapshot after mapping ER to relational model



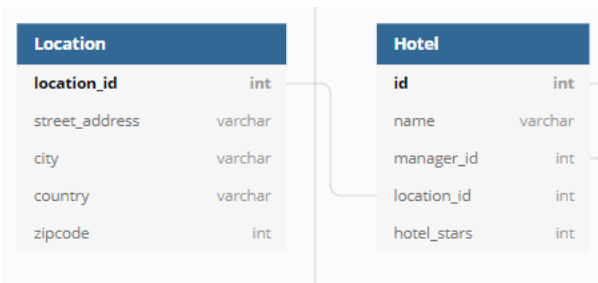
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Relational model after conversion to 1NF

1. Multivalued and composite attributes have been taken care of as listed below.



2. 1NF violation due to composite attribute location_composite has been fixed by the addition of a **Location** relation.

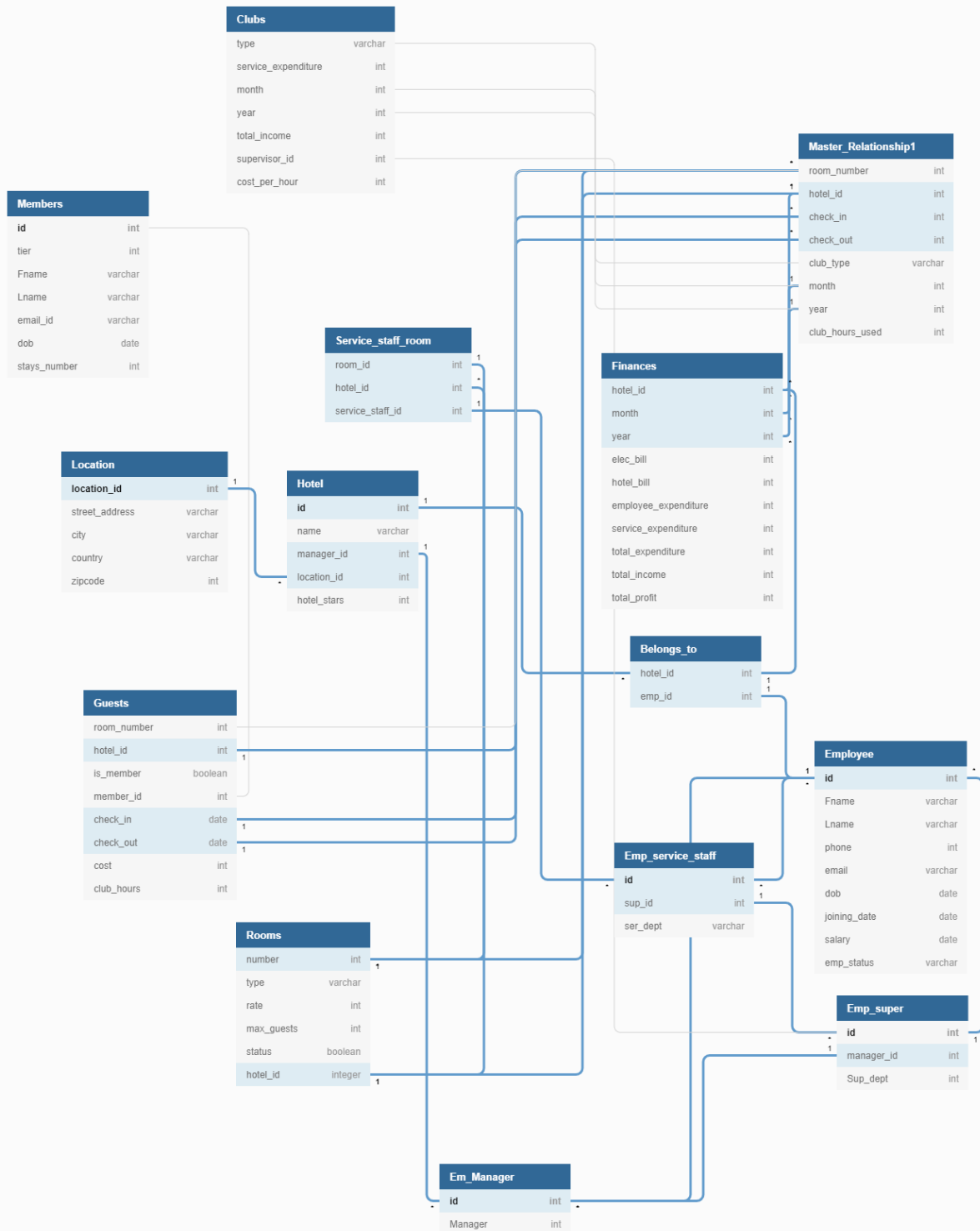


3. Multivalued attributes receive their own respective relations. (Removal of **Rooms.service_staff_id_multivalued** to be replaced by relation **Service_staff_room** and **Employee.hotel_id_multivalued** to be replaced by relation **Belongs_to**)



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Snapshot of relational model after conversion to 1NF



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Relational model after conversion to 2NF

No changes

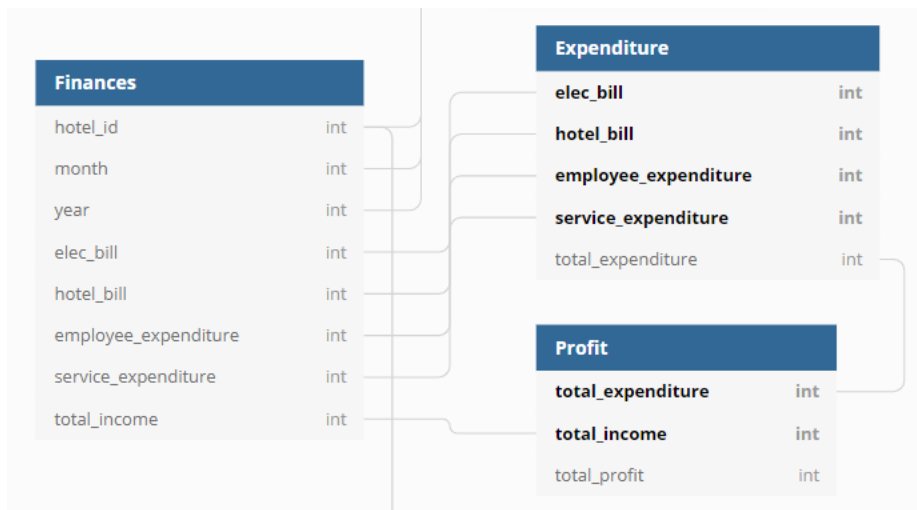
Relational model after conversion to 3NF

The relation **Finances** was found to be violating 3NF since attributes `total_expenditure` and `total_income` were dependent on non-key attributes. The changes were made as shown below

Relation **violating** 3NF:

Finances	
hotel_id	int
month	int
year	int
elec_bill	int
hotel_bill	int
employee_expenditure	int
service_expenditure	int
total_expenditure	int
total_income	int
total_profit	int

The solution was to create two relations **Expenditure** and **Profit** which helped fix the violation.



Fixing the 3NF violation

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Snapshot of relational model after conversion to 3NF

