Data and Applications

Project Phase-3

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ER to Relational Model

Relational model made from ER diagram from phase II

Minor changes in Phase-1 (requirements doc) :

1. Addition of attributes in weak entities

Canteen:

ATTRIBUTE	DATA TYPE	DOMAIN
participant_id **(act as foreign key)	int	
snack_price	int	The price of snack at most 3 digit integer
snack_name	varchar	The snack which will serve in canteen
open_time	time	A valid time
close_time	time	A valid time

Transportation:

ATTRIBUTE	DATA TYPE	DOMAIN
participant_id **(act as foreign key)	int	

area	varchar	At Most 100 characters
capacity	int	At Most 3 digit integer
driver_contact_number	int	valid 10 digit number
driver_name	varchar	At Most 100 characters

2. Equipments is changed to *Strong entity*(from weak entity as mentioned earlier in phase 1 and 2, we have realized it now, ask a TA, she said it's fine to change)

Equipments:

ATTRIBUTE	DATA TYPE	DOMAIN
sport	varchar	At most 100 characters
type	varchar	At most 50 characters
quantity	int	At Least 2 digit integer
equipment_id **	int	At most 3 digit integer

3. An extra primary key(*pcard_no [int]*) has been added to the entity Progress card.

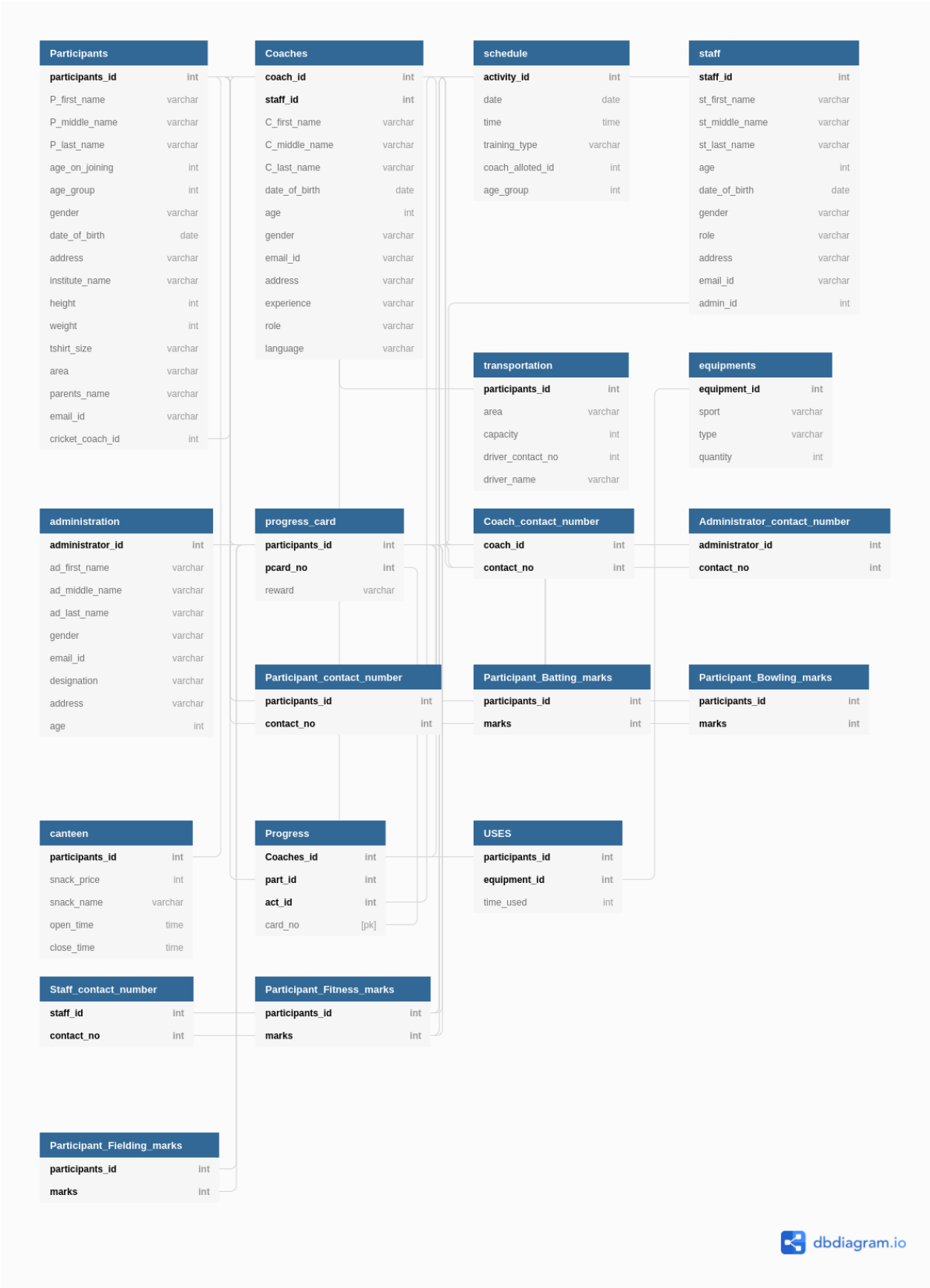
Changes made according to the textbook for relations :

1. Each composite attribute has been directly written as atomic attributes into the entity.
2. Regarding the Multivalued attributes, each of them has been replaced by a Table containing the primary key of the original entity along with attributes containing data of the multivalued attribute.
3. For the 4-degree relationship we created a separate relation, to represent the relationship between Participant, Coaches, Schedule and Progress Card, we have created a new table 'Progress'. The Progress

table has multiple attributes(foreign keys) which relate to the participating Entities' primary key.

4. 3 foreign keys were added to 3 respective N-side relations, name was changed and then linked to the primary key of 1-side relation as mentioned for the 1:N type relationships.
5. The primary key of weak entity's relation R is the combination of the primary key of the owner entity which has been mentioned here accordingly.
6. For M:N relation between Participants and Equipments (strong entity now) has been created by making a new relation "USES" and including 2 foreign keys in it as 2 primary keys of 2 participating entities. An attribute time_used was added.

RELATIONAL MODEL ON NEXT PAGE


Participants
participants_id int
P_first_name varchar
P_middle_name varchar
P_last_name varchar
age_on_joining int
age_group int
gender varchar
date_of_birth date
address varchar
institute_name varchar
height int
weight int
tshirt_size varchar
area varchar
parents_name varchar
email_id varchar
cricket_coach_id int
Coaches
coach_id int
staff_id int
C_first_name varchar
C_middle_name varchar
C_last_name varchar
date_of_birth date
age int
gender varchar
email_id varchar
address varchar
experience varchar
role varchar
language varchar
schedule
activity_id int
date date
time time
training_type varchar
coach_alloted_id int
age_group int
staff
staff_id int
st_first_name varchar
st_middle_name varchar
st_last_name varchar
age int
date_of_birth date
gender varchar
role varchar
address varchar
email_id varchar
admin_id int
transportation
participants_id int
area varchar
capacity int
driver_contact_no int
driver_name varchar
equipments
equipment_id int
sport varchar
type varchar
quantity int
administration
administrator_id int
ad_first_name varchar
ad_middle_name varchar
ad_last_name varchar
gender varchar
email_id varchar
designation varchar
address varchar
age int
progress_card
participants_id int
pcard_no int
reward varchar
Coach_contact_number
coach_id int
contact_no int
Administrator_contact_number
administrator_id int
contact_no int
Participant_contact_number
participants_id int
contact_no int
Participant_Batting_marks
participants_id int
marks int
Participant_Bowling_marks
participants_id int
marks int
canteen
participants_id int
snack_price int
snack_name varchar
open_time time
close_time time
Progress
Coaches_id int
part_id int
act_id int
card_no [pk]
USES
participants_id int
equipment_id int
time_used int
Staff_contact_number
staff_id int
contact_no int
Participant_Fitness_marks
participants_id int
marks int
Participant_Fielding_marks
participants_id int
marks int
dbdiagram.io

1-NF

The first normal form is achieved in the following manner:
Each composite attribute is split into its component attributes
Each multivalued attribute is represented as a separate table with a composite key.

Therefore, 1NF is the same as the relational model made already.

2-NF

The relational model is already in 2nd normal form as it does not have any non-prime attribute i.e. functionally dependent on the proper set of any candidate key of relation.
So, relational model is already in 2NF.

3-NF

By definition, a table is considered in third normal if the table/entity is already in the second normal form and the columns of the table/entity are non-transitively dependent on the primary key.

Here, We didn't find any transitive functional dependency in our relational data model(in a way 2NF only as they are the same). So, the relational model given above satisfies these conditions so the relational model is already in 3NF.