

FISHERIES MANAGEMENT SYSTEM

TEAM FORMATION:

Course Name : Database Management and Database Design

Course Code : INFO6210-36462

Professor Name : Naveen Kuragayala

Team Number : 9

Project Topic : Fisheries Management System

Team Members :

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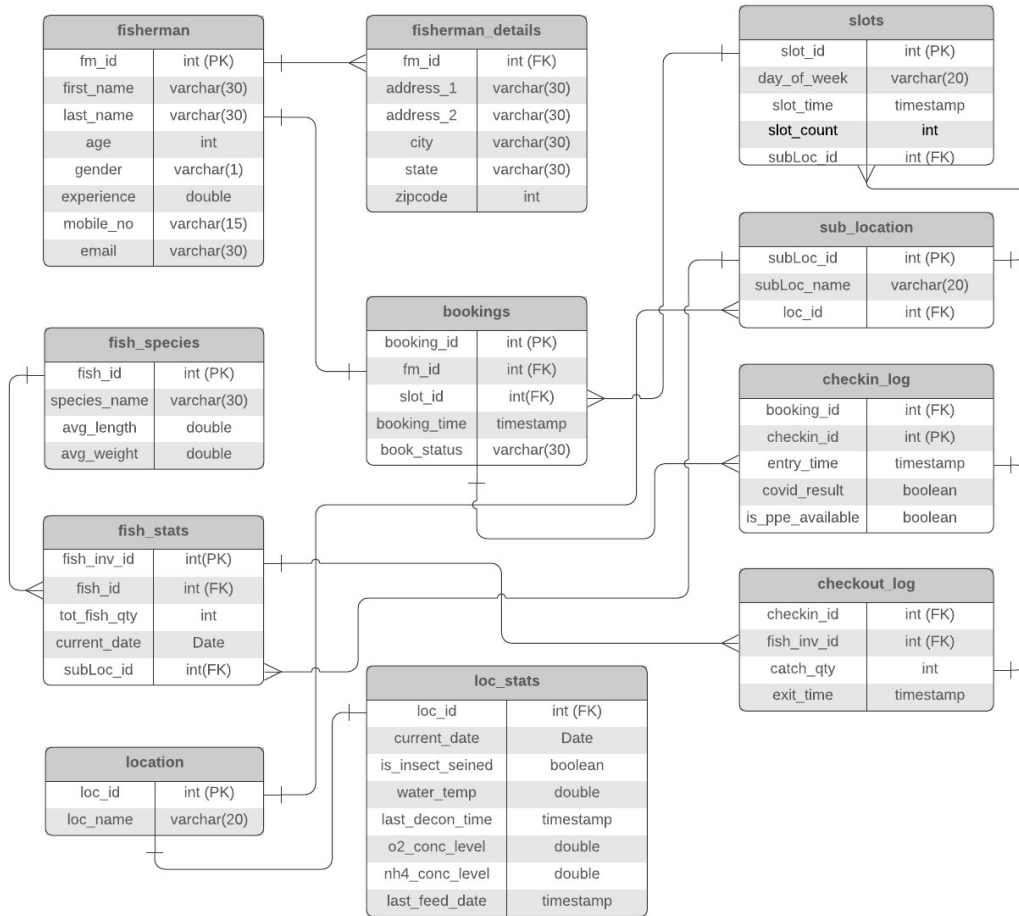
Business problems:

- Exploitation by over-fishing and unethical means of fishing has taken a huge toll on fishing industry and being a spoiler to biodiversity of water body.
- As there is a rising demand for fish and seafood, the fishing industry has been over-fishing in increasingly larger of water body.
- Over-fishing occurs when fish populations are reduced to below dangerously low levels, resulting in reduced growth, resource depletion, and sometimes unsustainable population sizes.
- This practice has been linked to the ruin of several ecosystems as well as reduced catches for many fishing companies.
- It is also estimated to cause huge financial loss for fishing teams around the world annually due over-fishing and subpar management practices.

Business problems addressed:

- Equal business opportunity is created for every fishing teams. By regulating various activities in the spawning areas to provide equal chances to the fishing members with a less catches.
- A system for enforcing the rule and implementing strategy and tool to monitor the result. And captured data is used to improve the current practices.
- Impact on biodiversity of water body is observed so that further deterioration can be stopped and situationally alternate method to improve eco-system is implemented.
- Healthy fish population is maintained by continuous monitoring of fish growth cycles and captures made by fisherman.

Revised Entity Relationship Diagram:



Entity and Attributes with Data types:

Entity Name	Attribute Name	Data type
fisherman	fm_id	int(PK)
	first_name	varchar(30)
	last_name	varchar(30)
	age	int
	gender	varchar(1)
	experience	double
	mobile_no	varchar(15)
	email	varchar(30)
fisherman_details	fm_id	int(FK)
	address_1	varchar(30)
	address_2	varchar(30)
	city	varchar(30)
	state	varchar(30)
	zipcode	int
slots	slot_id	int(PK)
	day_of_week	varchar(20)
	slot_time	timestamp
	subLoc_id	int(FK)
	Slot_count	int
fish_species	fish_id	int(PK)
	species_name	varchar(30)
	avg_length	double
	avg_weight	double
fish_stats	fish_inv_id	int(PK)
	fish_id	int(FK)
	tot_fish_qty	int
	current_date	date
	subLoc_id	int(FK)
location	loc_id	int(PK)
	loc_name	varchar(20)
sub_location	subLoc_id	int(PK)
	subLoc_name	varchar(20)
	loc_id	int(FK)
bookings	booking_id	int(PK)
	fm_id	int(FK)
	slot_id	int(FK)

	booking_time	timestamp
	book_status	varchar(30)
loc_stats	loc_id	int(FK)
	current_date	date
	is_insect_seined	boolean
	water_temp	double
	last_decon_time	timestamp
	O2_conc_level	double
	nh4_conc_level	double
	last_feed_date	timestamp
checkin_log	booking_id	int(FK)
	checkin_id	int(PK)
	entry_time	timestamp
	covid_result	boolean
	is_ppe_available	boolean
bookings_history	booking_id	int(FK)
	fm_id	int
	slot_id	int
	book_status	varchar(30)
	booking_time	timestamp
checkout_log	checkin_id	int(FK)
	fish_inv_id	int(FK)
	catch_qty	int
	exit_time	timestamp

Security (User level access, permissions):

DATABASE ACCESS RESTRICTIONS:

- Admin will have full access to all the table.
- Management staff will have read/write access for slots, Location, sub location, bookings, fisherman and read access for remaining table.
- Fisher men will have only read access for fisherman details, Fish stats, location.
- On-prem biologist will have read and edit access to loc stats table, read access to Fish stats, fish species tables.

Access table:

Table Name	Admin	Management staff	Fisher Men	On-prem Biologist
fisherman_details	Read/Write	Read	Read	No Access
slots	Read/Write	Read/Write	No Access	No Access
fish_species	Read/Write	Read	No Access	Read/Write
fish_stats	Read/Write	Read	Read	Read/Write
location	Read/Write	Read/Write	Read	Read
sub_location	Read/Write	Read/Write	No Access	Read
bookings	Read/Write	Read/Write	No Access	No Access
loc_stats	Read/Write	Read	No Access	Read/Write
checkin_log	Read/Write	Read	No Access	No Access
checkout_log	Read/Write	Read	No Access	No Access
fisherman	Read/Write	Read/Write	No Access	No Access

BUSINESS RULES:

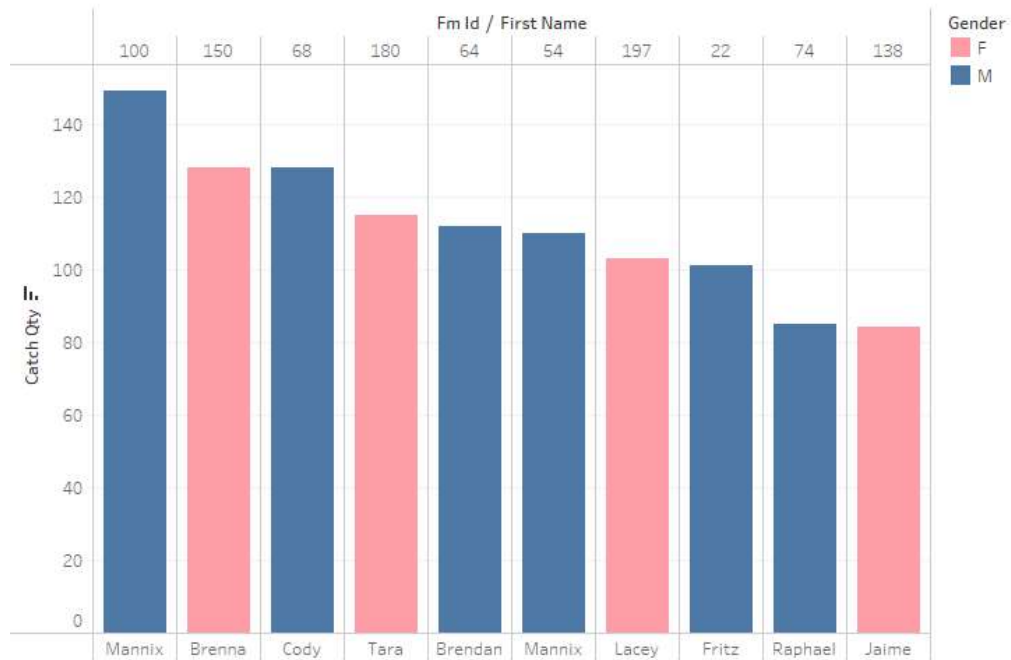
1. Every Fisherman is a member and the details are recorded in **fisherman** entity.
2. Each Fisherman can make only one booking in one day and it is recorded in **bookings** entity.
3. Each booking refers to a particular slot referring to Forenoon (FN) or Afternoon (AN) shift in a particular sub location.
4. There are currently three locations where the organization has installed their facility. Their details are available in **location** entity.
5. Each location has multiple sublocations so that the fishermen can be equally spaced to provide equal opportunities to all the members who have booked. They are available in **sub_location**.
6. Fish species available in a particular location are recorded in **fish_species** entity and the population of every recorded species is preserved by maintaining a threshold value beyond

which fishing at that particular sub location is prohibited. These things are recorded in **fish_stats** entity.

7. The biologist researchs the biological and environmental details of the installed locations and records it in **loc_stats** entity, which the help of which some essential factors like total fish quantity, etc.
8. The booking status remains pending until the fisherman confirms their attendance to the organization. If the attendance is not confirmed until an hour before the slot time, it gets cancelled automatically and will be available for others to book.
9. Each fisherman who has made a booking has to check in on time. There can be multiple check ins for a particular booking id but every check in has to have its corresponding check out by the end of the slot. These details are recorded in **checkin_log** and **checkout_log**.
10. Check in officers have to record if the fisherman is carrying appropriate Personal Protective Equipment and if they have taken Covid test within 72 hours. These details are again recorded in **checkin_log**.

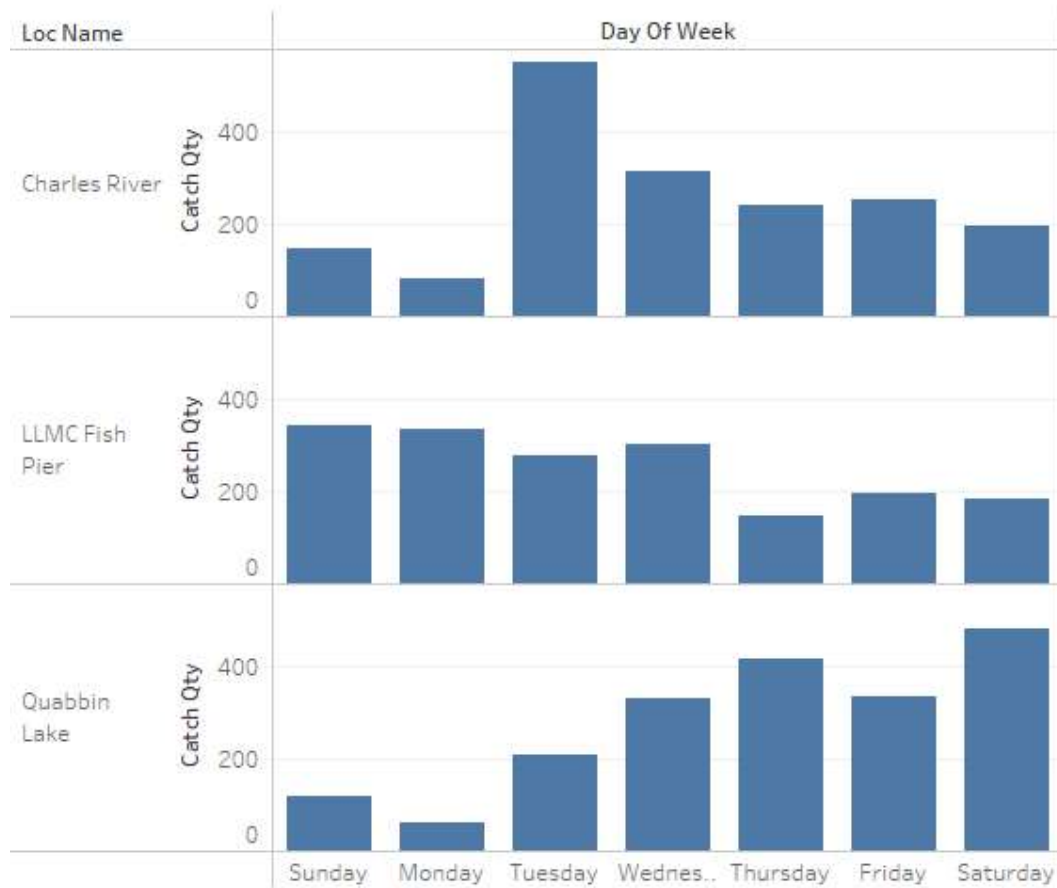
REPORTS :

Top 10 Fishermen Highest Catches



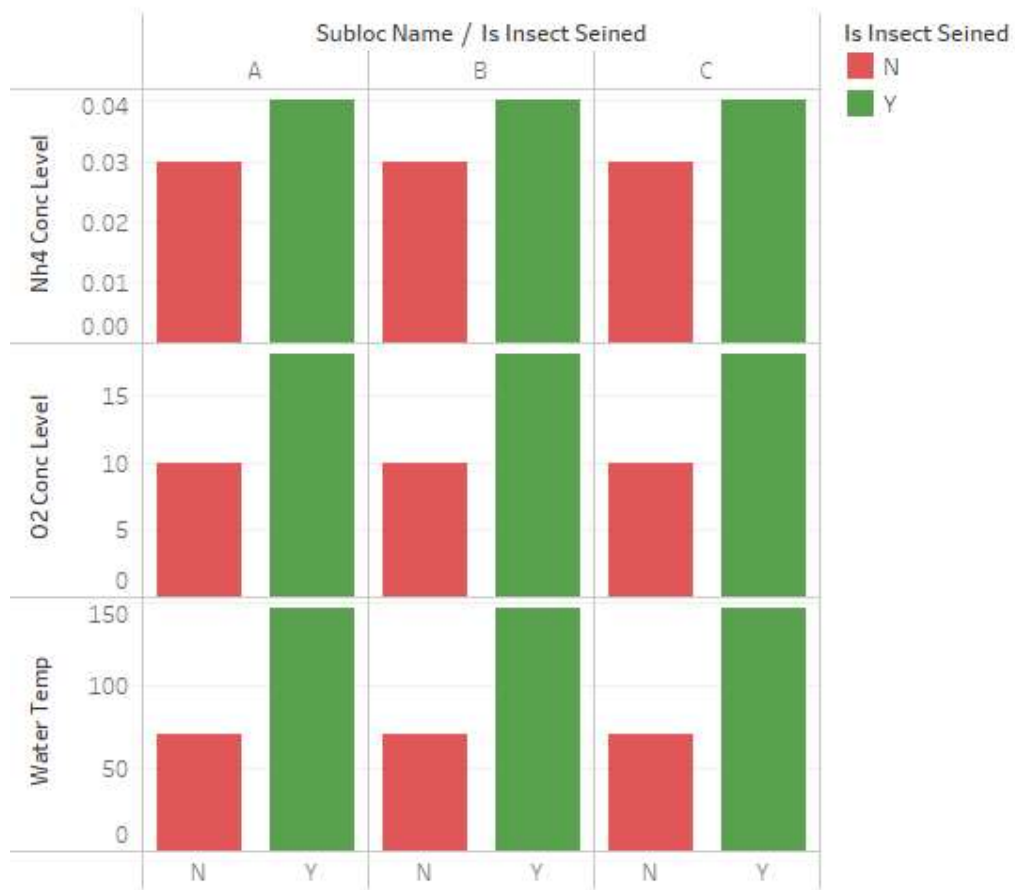
Sum of Catch Qty for each First Name broken down by Fm Id. Color shows details about Gender. The view is filtered on Fm Id, which has multiple members selected.

Daywise Distribution of Catches



Sum of Catch Qty for each Day Of Week broken down by Loc Name.

Insect Seining Effects



Sum of Nh4 Conc Level, sum of O2 Conc Level and sum of Water Temp for each Is Insect Seined broken down by Subloc Name. Color shows details about Is Insect Seined.

Number of Bookings over a Year



The trend of count of BOOKINGS for Booking Time Month.