Requirements specification for Selling business process

1. General description of business process

a. **A general description of the business process and a description of the performance metrics generated by this process, possible current analytical problems.**

The process of selling is as follows:

The customer enters the travel agency and can look around the office to see the available offers. Then they go to the help desk and the staff redirects the customer to one of the available travel agents. The travel agent offers them a booklet with detailed descriptions of the tours (destination, hotel, hotel room, price, duration). After the client makes a decision, the travel agent adds their personal information in the system "TourMaster" (if the client is new) or updates existing information (if it has changed). Then the travel agent adds the client to the participants of the tour. Finally, the client is prompted to pay (with the card or cash). If the client resigns from the tour, an appropriate record is made in the system and if the resignation was declared in less than a week before the start of the tour, then only 50% of the amount is returned instead of 90%. After the tour ends, clients are asked to fill in a questionnaire about it (Hotel rating, beach rating, transportation rating, overall rating, would you like to recommend).

Increase in the quarterly profit of the company to a level of 3% and higher.
Increase in the number of clients per quarter to a level of 3% and higher.

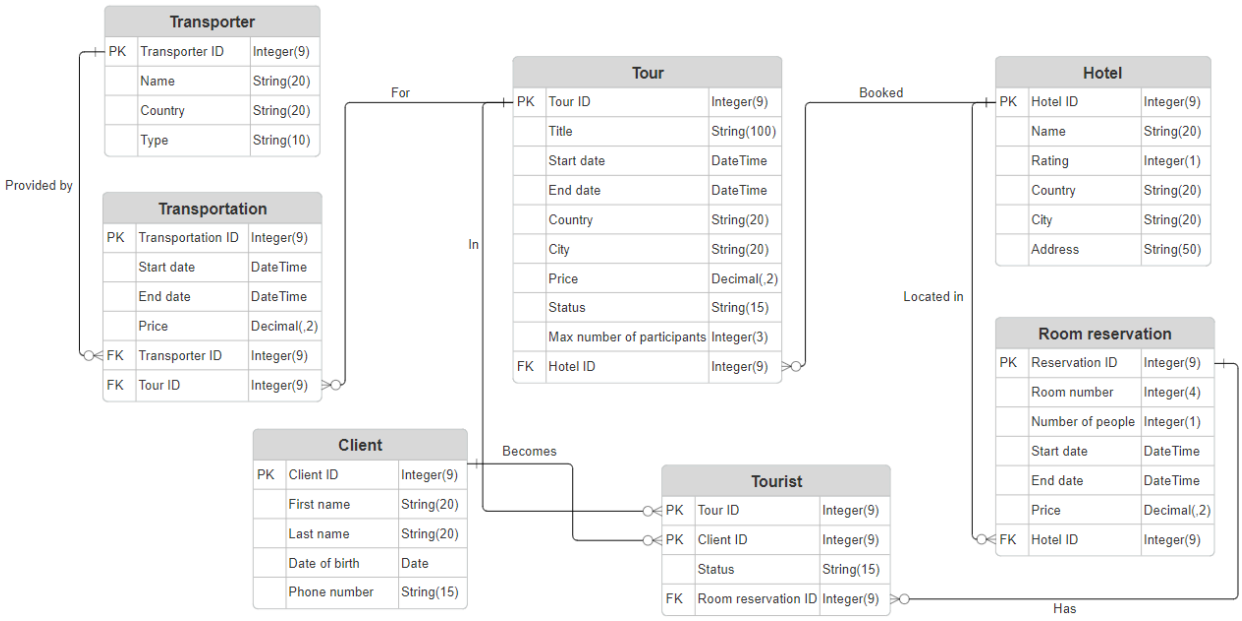
b. **Typical questions**

What is the most popular destination in this season?
What is the average cost of the tour this year?
What time spans are the most profitable?
Compare the income for each destination for the previous year.
Were the most highly rated tours the most profitable?

c. **Data**

All data is extracted from the company's system "TourMaster". The system stores information about tours, hotels, transporters, and clients. Also, surveys from the previous tours are available in the Excel sheet.

2. Data sources structures



TourMaster

Table name	Attribute	Attribute type	Description
Tour	A single tour happening during specified period, identified by Tour ID		
	Tour ID	Integer – 9 digits	Primary key, tour's ID
	Title	String – 100 characters	Tour's title
	Start date	DateTime	Date of the tour's start (with a minute precision)
	End date	DateTime	Date of the tour's end (with a minute precision)
	Country	String – 20 characters	Country where the tour will take place
	City	String – 20 characters	City where the tour will take place
	Price	Decimal (two digits precision)	Price of the tour (with agency's markup)

	Status	String characters – 15 characters	Status of the tour. Allowed values: New, Confirmed, Recruitment, In progress, Finished, Cancelled
	Max number of participants	Integer – 3 digits	Maximum number of people who can partake in the tour
	Hotel ID	Integer – 9 digits	Foreign key pointing to the hotel chosen for the tour. Implementation of the n-to-one relationship between Tour and Hotel.
Client	A client of the company, identified by Client ID		
	Client ID	Integer – 9 digits	Primary key, client's ID
	First name	String – 20 characters	First name of the client
	Last name	String – 20 characters	Last name of the client
	Date of birth	Date	Client's date of birth
	Phone number	String – 15 characters	Phone number of the client
Hotel	A hotel from one of the cooperative companies, identified by Hotel ID		
	Hotel ID	Integer – 9 digits	Primary key, hotel's ID
	Name	String – 20 characters	Name of the hotel
	Rating	Integer – 1 digit	Rating of the hotel. Available values: 1, 2, 3, 4, 5
	Country	String – 20 characters	Country where the hotel is located
	City	String – 20 characters	City where the hotel is located

	Address	String – 50 characters	Address of the hotel (Street name, Street number/Building)
Transporter	A company that provides transportation services, identified by Transporter ID		
	Transporter ID	Integer – 9 digits	Primary key, transporter's ID
	Name	String – 20 characters	Name of the transporter
	Country	String – 20 characters	Country where transportation company is located
	Type	String – 10 characters	Type of transportation services. Allowed values: Plane, Bus.
Tourist	Implementation of n-to-n relationships between Client, Tour, and Room Reservation, meaning client's place in specific tour. It is identified by two foreign keys of Client and Tour tables (foreign key from Room reservation is not used since client cannot change room during a tour)		
	Tour ID	Integer – 9 digits	Foreign key from Tour table, part of primary key
	Client ID	Integer – 9 digits	Foreign key from Client table, part of primary key
	Status	String – 15 characters	Status of the tourist. Allowed values: Recruited, In progress, Finished, Cancelled
	Room reservation ID	Integer – 9 digits	Foreign key from Room reservation table (one room can be assigned for multiple tourists)
Room reservation	A hotel room reserved for tourists (can be 1-, 2-, 3-, 4-person), identified by Reservation ID		
	Reservation ID	Integer – 9 digits	Primary key, reservation's ID
	Room number	Integer – 4 digits	Number of the room

	Number of people	Integer – 1 digit	Number of people the room can host. Available values: 1, 2, 3, 4
	Start date	DateTime	Date when tourist can check in
	End date	DateTime	Date when tourist must check out
	Price	Decimal (two digits precision)	Price of the room
	Hotel ID	Integer – 9 digits	Foreign key pointing to the hotel of the room. Implementation of the n-to-one relationship between Room reservation and Hotel
Transportation	Implementation of n-to-n relationship between Transporter and Tour, meaning providing transportation services by specific Transporter for specific Tour at specified time. It is identified by Transportation ID		
	Transportation ID	Integer – 9 digits	Primary key, transportation's ID
	Start date	DateTime	Start of the transportation
	End date	DateTime	End of the transportation
	Price	Decimal (two digits precision)	Price of the transportation
	Transporter ID	Integer – 9 digits	Foreign key from Transporter table
	Tour ID	Integer – 9 digits	Foreign key from Tour table

Relationship name	Tables	Cardinality	Description
Provided by	Transporter, Transportation	1:0..n	The company can commission transportation from different transporters in different countries

		0..n:1	The company commissions single transportation from only one transporter. If the company is newly added, then it can have no transportation commissions
For	Transportation, Tour	1:0..n	One tour requires at least six transportations (road to/from the airport by bus in both countries and two plane flights)
		0..n:1	One transportation is commissioned for one specific tour. If the transportation commissions have not been made, the tour can have no transportation
Booked	Tour, Hotel	1:0..n	It is widespread practice for the company to use the same hotel on different tours
		0..n:1	Change of hotel is not expected during the tour. If the hotel has not been decided, the tour can have no hotel
Located in	Room reservation, Hotel	1:0..n	Usually, hotels provide more than one room to book
		0..n:1	One specific room cannot be booked in two different hotels. If the hotel is newly added, then it can have no bookings
Has	Tourist, Room reservation	1:0..n	Company books 1-, 2-, 3-, 4-person rooms
		0..n:1	Tourist cannot change their room or be placed in two rooms. It is possible, that there will not be any tourists in the booked room
In	Tourist, Tour	1:0..n	The company provides group tours, so there are usually a few places in the group
		0..n:1	One tourist cannot have two tours simultaneously. If the tour is newly added, then it can have no tourists

Becomes	Client, Tourist	1:0..n	One client can become a tourist many times
		0..n:1	One tourist cannot have two personalities. If the client is newly added, then they were not a tourist in the company before

Excel

Sheet 1 (information about tours' ratings, gathered from the customers' questionnaires, each line describes one answered questionnaire, line 1 is a header row):

Column A – Tour identification number (numeric, 0 decimal precision)

Column B – Hotel rating (numeric, 1 decimal precision)

Column C – Beach rating (numeric, 1 decimal precision)

Column D – Transportation rating (numeric, 1 decimal precision)

Column E – Overall rating (numeric, 1 decimal precision)

Column F – Would you like to recommend (numeric, 0 or 1)

3. Scenarios of analytical problems

What do clients pay attention to when choosing tours?

1. What is the most popular destination in a given season?
2. How many tours received a low overall rating and low transportation rating?
3. How many people would recommend the tours with a high price compared to the tours with a low price?
4. Is there a trend of placing high ratings for hotels with high ratings?
5. The average price of the tours with the highest overall rating.
6. How does a discount affect the overall rating of the tour?

Areas that cause big losses.

1. In how many tours was the number of participants not maximal?
2. What tours had a long duration and high hotel prices in the last year?

3. What tours had a bad overall rating but cost highly in the last year?
4. In how many cases was there a big "negative" difference between the hotel rating and the room price in the last year?
5. In how many cases was there a big "negative" difference between the transportation rating and the transportation price in the last year?
6. What number of tours were cancelled because of the weather?

4. Data needed for analytical problems

Analytical problem: What do clients pay attention to when choosing tours?

1. What is the most popular destination in a given season?
   - **Destination** – TourMaster, table Tour, column Country.
   - **Season** – TourMaster, table Tour, column Start date.
2. How many tours received a low overall rating and low transportation rating?
   - **Low overall rating** – low overall rating is defined as [0-2] from Excel sheet 1, column E.
   - **Low transportation rating** – low transportation rating is defined as [0-2] from Excel sheet 1, column D.
3. How many people recommended the tours with a high price compared to the tours with a low price in the last year?
   - **Recommend** – recommended is defined as 1 in the Excel sheet 1, column F.
   - **High price** – high price is defined as price that is 50% more than the average price of the tour for this country in the last year.
   - **Low price** – low price is defined as price that is 20% less than the average price of the tour for this country in the last year.
   - **Price** – TourMaster, table Tour, column Price.
   - **Country** – TourMaster, table Tour, column Country.
   - **Last year** – TourMaster, table Tour, column StartDate.
4. Is there a trend of placing high ratings for hotels with high ratings?
   - **Placed high rating** – placed high rating is defined as [4-5] from Excel sheet 1, column B.
   - **Hotel's high rating** – hotel's high rating is defined as [4-5] from TourMaster, table Hotel, column Rating.
5. The average price of the tours with the highest overall rating in the last year.
   - **Highest overall rating** – highest overall rating is defined as 5 from the Excel sheet 1, column E.
   - **Price** – TourMaster, table Tour, column Price.

- **Last year** – TourMaster, table Tour, column StartDate.

6. How does a discount affect the overall rating of the tour?
   - **Overall rating** – Excel sheet 1, column E.
   - **Discount** – no such information.

Analytical problem: Areas that cause big losses.

1. In how many tours was the number of participants not maximal?
   - **Number of participants** – number of participants is defined as the difference between maximal and actual number of participants.
   - **Maximal number of participants** – TourMaster, table Tour, column MaxNumberOfParticipants.
   - **ID of the tour** – TourMaster, table Tour, column ID.
   - **Tourists that actually participated** – TourMaster, table Tourist, column TourID.
2. What tours had a long duration and high hotel prices in the last year?
   - **Long duration** – long duration is defined as the difference between the end and start dates of the tour.
   - **High hotel prices** – high hotel prices are defined as an average price for the rooms in this hotel that is 50% more than the average price of the hotel rooms in this country in the last year.
   - **Start of the tour** – TourMaster, table Tour, column StartDate.
   - **End of the tour** – TourMaster, table Tour, column EndDate.
   - **Room price** – TourMaster, table RoomReservation, column Price.
   - **Country** – TourMaster, table Tour, column Country.
   - **Last year** – TourMaster, table Tour, column StartDate.
3. What tours had a bad overall rating but cost highly in the last year?
   - **Bad overall rating** – bad overall rating is defined as 0-2 from Excel sheet 1, column E.
   - **High cost** – high cost is defined as tour price that is 50% more than the average price of the tour for this country in the last year.
   - **Price** – TourMaster, table Tour, column Price.
   - **Country** – TourMaster, table Tour, column Country.
   - **Last year** – TourMaster, table Tour, column StartDate.
4. In how many cases was there a big "negative" difference between the hotel rating and the room price in the last year?
   - **Big "negative" difference** – big "negative" difference is defined as room price that is 50% more than the average price for the rooms in this country in the last year and hotel rating being below 2.5.

- **Hotel rating** – Excel sheet 1, column B.
- **Room price** – TourMaster, table Room, column Price.
- **Country** – TourMaster, table Tour, column Country.
- **Last year** – TourMaster, table Tour, column StartDate.

5. In how many cases was there a big "negative" difference between the transportation rating and the transportation price in the last year?
   - **Big "negative" difference** – big "negative" difference is defined as average transportation price for this tour that is 50% more than average of all the transportation prices in this country in the last year and transportation rating being below 2.5.
   - **Transportation rating** – Excel sheet 1, column D.
   - **Transportation price** – TourMaster, table Transportation, column Price.
   - **Country** – TourMaster, table Tour, column Country.
   - **Last year** – TourMaster, table Tour, column StartDate.
6. What number of tours were cancelled because of the weather?
   - **Cancelled** – TourMaster, table Tour, column Status.
   - **Weather** – must be collected from some publicly available weather service.

It is not possible to build a BI system to support a travel agency in solving these analytical problems without introducing a bonus system. The travel agency can introduce a bonus lottery for the clients that buy the tour. During the booking of the tour, the agent draws a number and if it's a winning number the client gets the discount. A new column should be added to the Tour table to record a new price.