

# Roll & Play board games spot - Data warehouse design

## Business process

The Data warehouse is designed for organizing tournaments. We described this process in a detailed way in the document Specification of business processes.

## Relational Database schema

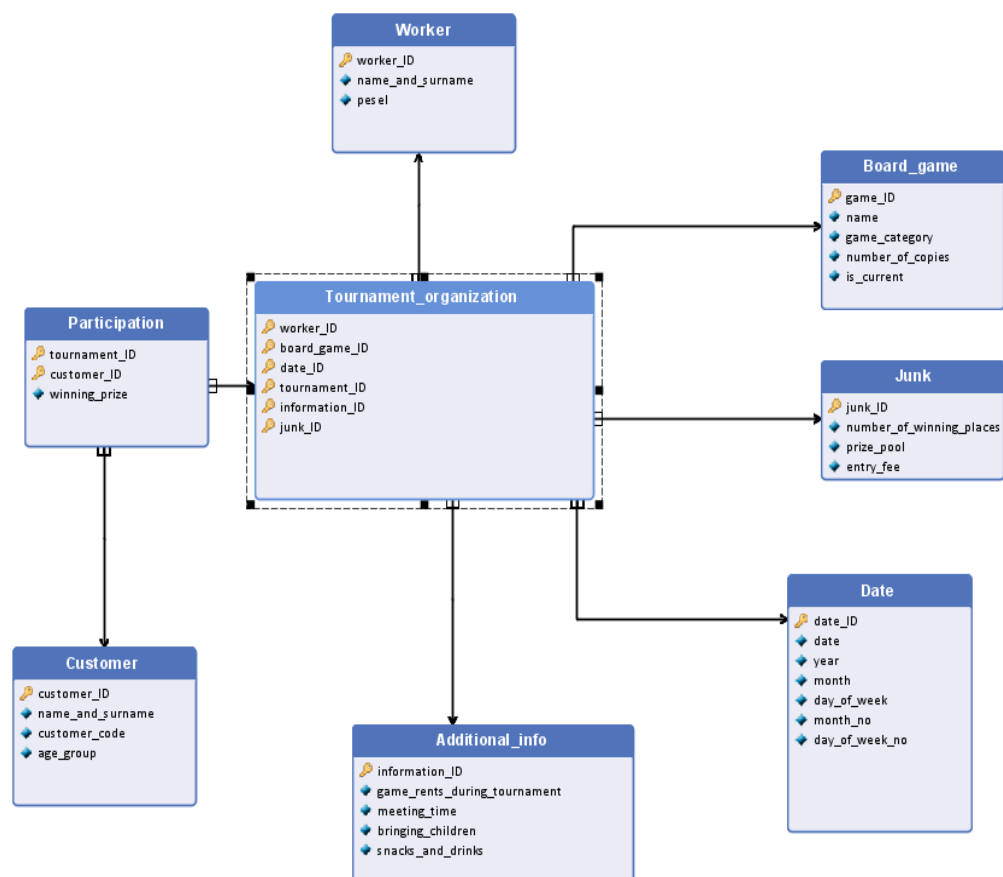


table name ▼	attribute ▼	attribute type ▼	description ▼
Tournament_ organization (FACT TABLE )			one tuple describe one fact of tournament
	tournament_ID	numeric	PK, surrogate key
	worker_ID	numeric	FK Worker Worker that was responsible for tournament
	board_game_ID	numeric	FK Game Game that was played at the tournament
	date_ID	numeric	FK Date Date of the tournament
	information_ID	numeric	FK information extra information about tournament
	junk_ID	numeric	FK junk, junk attributes
participation (FACT TABLE)			one tuple describes a single customer's participation in the tournament
	tournament_ID	numeric	FK Tournament organization
	customer_ID	numeric	FK Customer Customer that take part in the tournament
	winning_prize	money	money amount that each customer won in specific tournamnet, number indicate to the amount that customer won, if null it means that customer won nothing
Customer (DIMENSION TABLE)			one tuple contains basic information about our customer
	customer_ID	numeric	PK, surrogate key
	customer_code	numeric	number that is assigning to customer after registration in our system. We take this data from database , columns name and surname
	name_and_surname	varchar(100)	customer name and surname we take this information from database and columns name and surname
	age_group	Varchar(20)	age group we take this data from database column dateof birth. Age group, allowed values : between 18 and 21, between 22 and 25, between 26 and 30, between 31 and 50, more than 50

Worker (DIMENSION TABLE)			one tuple contain basic information about one worker
	worker_ID	numeric	PK, surrogate key
	pesel	numeric	unque identifier
	name_and_surname	varchar(50)	worker name and surname
Date (DIMENSION TABLE)			one tuple describe one day
	date_ID	numeric	PK, surrogate key
	date	date	date
	year	4 digits	year
	month	varchar(10)	we take this data from database column Tournament month, allowed values: January, February, March, April, May, June, July, August, September, October, November, December
	month_no	numeric	month's numeric value
	day_of_week	varchar(10)	we take this data from database column Tournament,day, allowed values: Monday, Tuesday, Wensday, Thursday, Friday, Saturday, Sunday
	day_of_week_no	numeric	weekday's numeric value
additional_info (DIMENSION TABLE)			one tuple represent one comment to the tournament
	information_ID	numeric	PK, surrogate key

	games_rents_during_tournament	varchar(60)	extra information about renting games during tournamnets, possible values: 'rents disabled during tournament', 'rents allowed during tournament'
	meeting_time	varchar(60)	extra information about specific time when we participants should come to the tournamnets, possible values: 'morning', 'evening'
	bringing_children	varchar(60)	extra information about bringing kids to the tournamnets, possible values: 'do not bring children', 'children allowed'
	snack_and_drinks	varchar(60)	extra information about drinks and snacks during tournament, possible values: 'free snacks and drinks', 'no snacks and drinks provided'
Board_game (DIMENSION TABLE)			one tuple give information about single board game title
	game_ID	numeric	PK, surrogate key
	name	varchar(50)	game name
	game category	varchar(50)	possible value: Family Deck-Building Card_Drafting Strategy Adventure Cooperative Party Abstract_Strategy Card_Game
	number_of_copies	varchar(30)	number of copies for specific game, allowed values: between 0 and 3, from 4 to 5, and more than 5
	is_current	boolean	"True" if information is current, otherwise "False" (SCD2 implementation)
Junk (DIMENSION TABLE)	junk_ID	numeric	PK, surrogate key
	number_of_winning_places	varchar(20)	number of places that win sth in the tournament, allowed values: between 0 and 2, from 3 to 4, from 5 to 6

	prize_pool	varchar(20)	prize pool for specific tournament. Prize pool, allowed values: between 0 and 1000, from 1001 to 2000, from 2001 to 3000, from 3001 to 4000, from 4001 to 5000
	entry_fee	varchar(10)	The number indicating how much customer needs to pay to participate in tournament. Allowed values: 10 - 30, 40 - 60, 70 - 100

## Dimensional model

### Fact definitions

**Fact 1 Tournament organization fact:** Organizing tournament, each tournament is uniquely identified, associated with a specific board game, scheduled for a particular date, organized by a designated worker, and includes additional event-specific information.

Fact table: Tournament\_organization

Granularity:

- specified date of tournament
- specified game name
- specified worker
- specified information about tournament
- specified number of winning places
- specified prize pool

Measures and aggregation functions:

Number of tournaments - COUNT(tournament\_ID)

**Fact 2 participation fact:** Tournament participation is linked to a specific tournament and specific customer.

Fact table: participation

Granularity:

- specified tournament
- specified customer

Measures and aggregation functions:

Number of participants - COUNT(customer\_ID)

Number of unique participants - COUNT DISTINCT(customer\_ID)

Number of tournaments - COUNT DISTINCT (tournament\_ID)

Average number of tournament participants = Number of participants / Number of tournaments

Entry fees collected - SUM(entry\_fee)

Average amount of money won in a tournament - AVG(winning\_prize)

## Dimension definitions

### Dimensions for Fact 1 Tournament organization fact:

DIMENSION/DIMENSION ATTRIBUTE	TABLE/COLUMN	TYPE
Worker	Worker	Dimension
Worker Name and Surname	Worker.name_and_surname	Dimension Attribute
Worker Pesel number	Worker.pesel	Dimension Attribute
Board Game	Board_game	Dimension
Board Game Name	Board_game.name	Dimension Attribute
Board Game Category	Board_game.game_category	Dimension Attribute
Board Game Number of Copies	Board_game.number_of_copies	Dimension Attribute
Board Game Hierarchy	• Board_Game.category •• Board_Game.name	Hierarchical dimension
Junk	Junk	Dimension
Number of winning places in a tournament	Junk.number_of_winning_places	Dimension Attribute
Prize pool of the tournament	Junk.prize_pool	Dimension Attribute
Entry Fee of Participant	Junk.entry_fee	Dimension Attribute
Tournament Date	Date	Dimension
Tournament Year	Date.year	Dimension Attribute
Tournament Month	Date.month	Dimension Attribute
Tournament Day	Date.date	Dimension Attribute
Tournament Day of the week	Date.day_of_week	Dimension Attribute
Tournament Month No	Date.month_no	Dimension Attribute
Tournament Day of the week No	Date.day_of_week_no	Dimension Attribute
Tournament Date Hierarchy	• Date.year •• Date.month ••• Date.date	Hierarchical dimension
Tournament Day of the Week Hierarchy	• Date.year •• Date.month ••• Date.day_of_week	Hierarchical dimension
Additional Info	Additional_info	Dimension
Can games be rented during tournament	Additional_info.game_rents_during_tournament	Dimension Attribute
Meeting time of tournament	Additional_info.meeting_time	Dimension Attribute
Are children allowed on tournament	Additional_info.bringing_children	Dimension Attribute
Are there snacks and drinks on tournament	Additional_info.snacks_and_drinks	Dimension Attribute
Customer	Customer	Dimension
Customer Name and Surname	Customer.name_and_surname	Dimension Attribute
Code of the customer	Customer.customer_code	Dimension Attribute
Age Interval of Customer	Customer.age_group	Dimension Attribute
Participation	Participation	Dimension
Winning Prize of Participant	Participation.winning_prize	Dimension Attribute

## Dimensions for Fact 2 Participation in the tournament fact:

DIMENSION/DIMENSION ATTRIBUTE	TABLE/COLUMN	TYPE
Tournament Organization	Tournament_organization	Dimension
Worker	Worker	Dimension
Worker Name and Surname	Worker.name_and_surname	Dimension Attribute
Worker Pesel number	Worker.pesel	Dimension Attribute
Board Game	Board_game	Dimension
Board Game Name	Board_game.name	Dimension Attribute
Board Game Category	Board_game.game_category	Dimension Attribute
Board Game Number of Copies	Board_game.number_of_copies	Dimension Attribute
Board Game Hierarchy	• Board_Game.category	Hierarchical dimension
	•• Board_Game.name	
Junk	Junk	Dimension
Number of winning places in a tournament	Junk.number_of_winning_places	Dimension Attribute
Prize pool of the tournament	Junk.prize_pool	Dimension Attribute
Entry Fee of Participant	Junk.entry_fee	Dimension Attribute
Tournament Date	Date	Dimension
Tournament Year	Date.year	Dimension Attribute
Tournament Month	Date.month	Dimension Attribute
Tournament Day	Date.date	Dimension Attribute
Tournament Day of the week	Date.day_of_week	Dimension Attribute
Tournament Month No	Date.month_no	Dimension Attribute
Tournament Day of the week No	Date.day_of_week_no	Dimension Attribute
Tournament Date Hierarchy	• Date.year	Hierarchical dimension
	•• Date.month	
	••• Date.date	
Tournament Day of the Week Hierarchy	• Date.year	Hierarchical dimension
	•• Date.month	
	••• Date.day_of_week	
Additional Info	Additional_info	Dimension
Can games be rented during tournament	Additional_info.game_rents_during_tournament	Dimension Attribute
Meeting time of tournament	Additional_info.meeting_time	Dimension Attribute
Are children allowed on tournament	Additional_info.bringing_children	Dimension Attribute
Are there snacks and drinks on tournament	Additional_info.snacks_and_drinks	Dimension Attribute
Customer	Customer	Dimension
Customer Name and Surname	Customer.name_and_surname	Dimension Attribute
Code of the customer	Customer.customer_code	Dimension Attribute
Age Interval of Customer	Customer.age_group	Dimension Attribute

## Checking the feasibility of queries based on the multidimensional model

1. What is the impact of the prize pool on the number of participants?  
Measure: Average number of tournament participants  
Dimension: Junk (Dimension Attributes: prize\_pool)
2. What is the impact of entry price on the number of participants?  
Measure: Average number of tournament participants  
Dimension: Junk (Dimension Attributes: entry\_fee)
3. What is the impact of the number of places with money reward on the number of participants?  
Measure: Average number of tournament participants  
Dimension: Junk (Dimension Attributes: number\_of\_winning\_places)
4. Which game has the most tournament players?  
Measure: Average number of tournament participants  
Dimension: Board game (Dimension Attributes: Name)

5. Are tournaments hosted on the weekends more popular?  
Measure: Average number of tournament participants  
Dimension: Date (Dimension Attributes: day\_of\_week)
6. Are tournaments with free snacks and drinks more popular?  
Measure: Average number of tournament participants  
Dimension: Additional info (Dimension Attributes: snacks\_and\_drinks)
7. Are tournaments only for adult players less popular?  
Measure: Average number of tournament participants  
Dimension: Additional info (Dimension Attributes: bringing\_children)
8. Does the time of tournament (morning/evening) influence the attendance?  
Measure: Average number of tournament participants  
Dimension: Additional info (Dimension Attributes: meeting\_time)
9. What age group is the biggest percentage of tournament players?  
Measure: Number of unique participants  
Dimension: Customer (Dimension Attributes: age\_group)
10. Do most popular games have more copies in the shop?  
Measure: Average number of tournament participants  
Dimension: Board game (Dimension Attributes: name)  
Dimension: Board game (Dimension Attributes: number\_of\_copies)

### Checking if there are Data in the Data sources needed to fill the Data warehouse

TABLE NAME	COLUMN	SOURCE
tournament organization	one tuple describe one tournament	
	worker_ID	Worker ID foreign key from dimension table. Refers to the worker's ID assigned at the time of employment.
	board_game_ID	Game ID foreign key from dimension table. Each game has its own game ID. Based on the order of joining our store. Board game ID from database column board game ID
	date_ID	Date ID foreign key from dimension table. Based on the date of the tournament from datatbase.
	tournament_ID	Tournament ID. Primary key. Tournament ID is based on database column tournament.
	junk_ID	junk ID. Surrogate key Primary key
	information_ID	Information ID foreign key from dimension table. Based on the specification of the tournament choosen by CEO. Taken from database, column Information ID
participation	one tuple describe single participation by customer in the tournament	
	tournament_ID	Tournament ID foreign key from tournament organization table. Tournament ID is based on database column tournament.
	customer_ID	Customer code foreign key from dimension table. Each customer gets their unique code needed to participate in tournaments



	winning_prize	Winning prize, prize that participant won in tournament, data taken from database column TournamentParticipants.
customer	one tuple describe one customer	
	customer_ID	Customer ID. Primary key numerated from 1
	customer_code	Customer code. Customer code is based on tournaments database, table customer account info, column customer_code
	name_and_surname	Name and surname of the customer. Taken from tournament database, table customer account info, column name and column surname
	age_group	Age group, we split our customers into 5 age category, this data is taken from customer date of birth column in database. Possible values: 18 < age < 21 - young adults, 22<age<25 - early adults, 26 < age< 30 mid-adults, 31 < age < 50 - mature adults , age> 50 - seniors
additional_info	one tuple contain extra information about specific tournament	
	information_ID	Information ID. Primary key numerated from 1
	possible_tournament_info	Specification of additional information regarding specific tournament. Taken from tournament ceo excel, column additional_info.
	games_rents_during_tournament	Specification of information regarding renting games during tournament. Taken from tournament ceo excel, column additional_info.
	meeting_time	Specification of information regarding time of the tournament. Taken from tournament ceo excel, column additional_info.
	bringing_children	Specification of information regarding bringing children to the tournament. Taken from tournament ceo excel, column additional_info.
	snack_and_drinks	Specification of information regarding snaks and drinks during tournament. Taken from tournament ceo excel, column additional_info.
board_game	one tuple describe one game	
	game_ID	Game ID. Primary key. Game ID is based on tournament database, table owned board games, column game_ID
	name	Name of the specific game. Taken from tournament database, table owned board games, column name
	game_category	Category of this exact game. Taken from tournament database, table owned board games, column category
	number_of_copies	Number of copies we own for each specific game. This quantity can change over time, as we may acquire or discard copies.Possible number of copies: number_of_copies <=3 - small amount, 3<number_of_copies <= 5 -normal amount, number of copies> 5 - big amount
	is_current	Boolean value that shows if the information is current. Value "True" if information is current, otherwise value "False" (SCD2 implementation)
date	one tuple describe date when tournament took part	
worker		
	worker_ID	worker ID . Surrogate key Primary key
	pesel	Worker PESEL. Workers PESEL is based on tournament database, table workers, column pesel
	name_and_surname	Name and surname of the worker. Taken from tournament database, table workers, column name and column surname
junk		
	junk_ID	junk ID. Surrogate key Primary key
	number_of_winning_places	number of winning places, we split it in three categories. We take this value from Excel. Allowed values: between 0 and 2 - small, between 3-4, medium, between 5 and 6 - high

prize_pool		prize pool, we know what is prize pool for all winners. We take this value from database table tournament and column prize_pool. Allowed values: 0-1000 - poor, 1001-2000 - small, 2001 - 3000 - moderate, 3001 - 4000 - high, 4001 - 5000- very high
	entry_fee	Cost of taking a part in tournament. Taken from tournament database, table tournaments, column entry price.