Requirements specification for *Feeding kids in school canteen* business process

1. General description of business process

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 feeding kids in the school canteen is as follows:
The day before cantina workers assess how much food they need to prepare for the next day. The kids each day can go to the school canteen and eat lunch there. The canteen workers prepare a list of students in excel who eat lunch every day and they pass that information to the system. The system adds a bill to the parent of the kid from the list. At the end of the day the remaining food is summed up and then if necessary thrown out. At the end of the month the survey is conducted. Every parent gets a survey to fill out via Google Forms platform. The survey consists of 3 questions: about taste, quantity and other remarks.

The increase of children eating in the school canteen at a level not less than 0,5% compared to the previous month.
The decrease in the amount of food waste at level not less than 1% compared to the previous month.
KPI

b. Typical questions

How much food was wasted in a given month/day?
How many children were eating in the school canteen on a given day?
In which month there was the highest number of children using the school canteen?
What were the average taste scores in the given month?
How many surveys were collected in percentage compared to the number of students that have eaten at least once?
Did the number of food thrown out exceed 20% of all food bought?

c. Data

The cantina workers collect data in excel about how much food was bought and how much was thrown out each day. In addition information about how much money is spent on food is

also provided as well as the variable cost of meals. The information about how many meals are sold is contained in the “GartenSystem” which is also responsible for tuition fee collection. A list of kids and their parents is taken from that system. The answers from the survey about the quality and quantity of the food will be also collected in the excel sheet.

2. Data sources structures

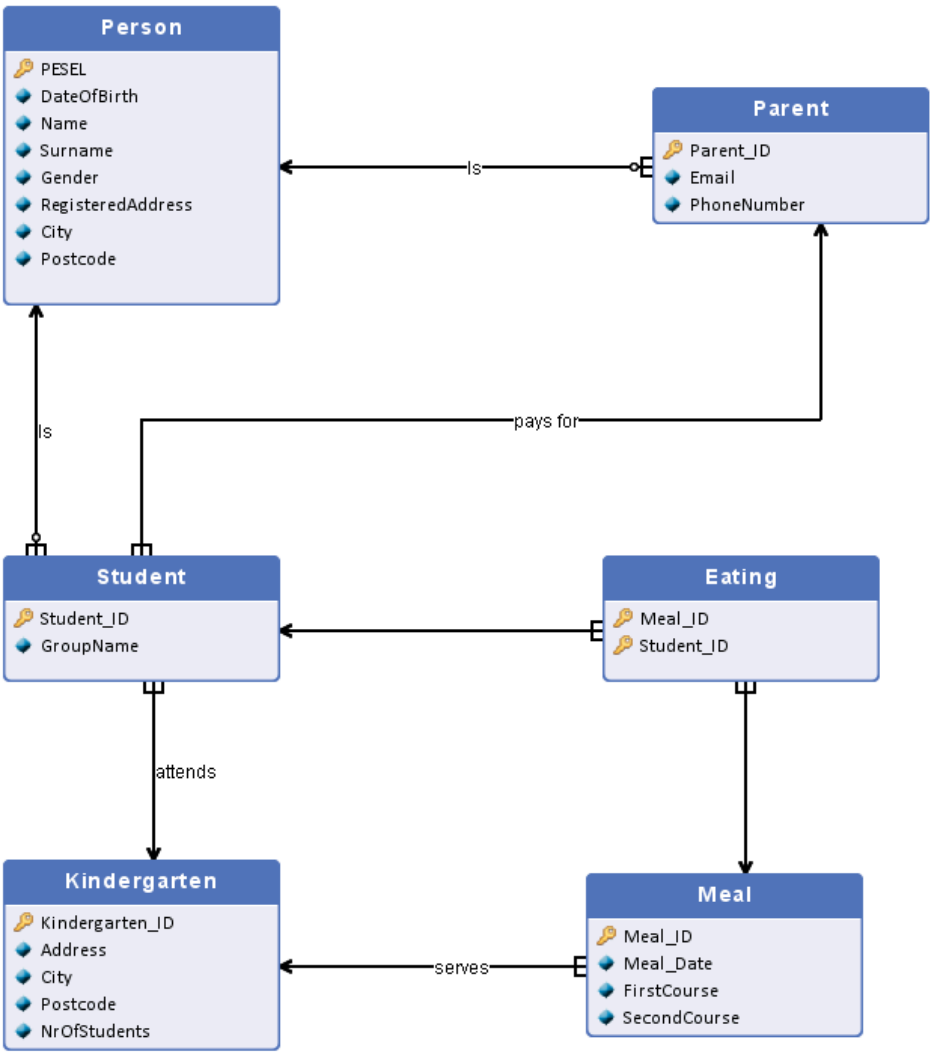
GartenSystem Database

TABLE NAME	ATTRIBUTE	ATTRIBUTE TYPE	DESCRIPTION
PERSON	every person included in the GartenSystem		
	PESEL	Numerical - 11	PK - individual number for every polish citizen
	DateOfBirth	DateTime	Date of birth in dd.mm.yyyy format
	Name	String characters - 20	person’s name
	Surname	String characters - 30	person’s surname
	Gender	character	char (F or M) that implies gender
	Registered Address	String characters - 30	person’s registered address without city and postcode

	City	String characters - 20	person’s registered city address
	Postcode	String characters - 6	person’s postcode in 00-000 format
STUDENT	student that attends the kindergarten		
	Student_ID	Numerical - 8	student individual number
	GroupName	String characters - 6	a group that students plays in
	IsCurrent	Boolean	informs whether this is still a student
	Person_PESEL	Numerical - 11	FK from **PERSON**
	Parent_ID	Numerical - 8	FK from **PARENT**
PARENT	Parent of a student/s (One parent can have multiple kids) that pays tuition and by doing so for meals too		
	Parent_ID	Numerical - 8	parent’s individual number
	Email	String characters - 20	parent’s email address on which review google form is sumbited
	PhoneNumber	String characters -9	parent’s phone number
KINDERGARTEN	A specific kindergarten that kids attend and teachers work overlooking them		
	Kindergarten_ID	Numerical- 3	a specific number used to identify the school

	Address	String characters - 30	kindergarten’s address without city and postcode
	City	String characters - 20	kindergarten’s city location
	Postcode	String characters - 6	kindergarten’s postcode in 00-000 format
	NrOfStudents	Numerical- 3	number if students that attend the kindergarten
MEAL	a meal made by school canteen		
	Meal_ID	Numerical- 6	a specific number used to identify the particular meal
	Meal_Date	DateTime	Date when meal was given out in dd.mm.yyyy format
	FirstCourse	String characters - 10	a first course served by the canteen in the particular meal
	SecondCourse	String characters - 10	a second course served by the canteen in the particular meal
	Kindergarten_ID	Numerical- 3	FK from **KINDERGARTEN** part of PK

EATING	Implementation of many-to-many relationship between MEAL and STUDENT. It means that a given STUDENT has eaten a given lunch. Identified by foreign keys to tables MEAL and STUDENT		
	Meal_ID	Numerical- 6	FK from **MEAL** part of PK
	Student_ID	Numerical - 8	FK from **STUDENT** part of PK



Food Excel File

Sheet 1 (contains information about the amount of food bought, wasted and money spent every day):

Column A - Date,
Column B - Amount of food thrown out(in kg),
Column C - Amount of food bought (in kg),
Column D - Money invested to buy products (in zł)
Column E - Kindergarten ID

3. Scenarios of analytical problems

Why was there a decrease/increase in the number of children eating in the kindergarten canteen?

1. Compare the number of children in the school canteen between months.
2. Compare the number of meals eaten by every kid to his age.
3. Compare the number of meals sold of different types in an analyzed month relative to the previous month.
4. What is the difference in number of children eating in school between the seasons?
5. Compare the number of children between weekdays.
6. Compare the number of kids eating annually in relation to kindergarten size, defined as the number of kids attending kindergarten, in the current and previous month.
7. What is the percentage of children who bring their own lunch to school versus those who eat at the canteen?

Why there are changes in the amount of food wasted?

1. What are the differences in the number of children between months?
2. Which meals cause a higher amount of food wasted than on average?
3. How the taste of food affects the amount of food wasted?
4. Compare the number of meals served the day before and the number of food wasted in that day?
5. Compare the number of money invested to buy products daily to amount of food thrown out.
6. Compare the effect of the popularity of meal to the amount of food wasted.

4. Data needed for analytical problems

Analytical problem: “Why was there a decrease/increase in the number of children eating in the kindergarten canteen?”

1. Compare the number of children in the school canteen between months.
    - **number of children** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **months** - *GartenSystem,* table *Meal,* column *Meal_Date*
2. Compare the number of meals eaten by every kid to his age
    - **number of meals** - *GartenSystem,* table *Eating*, column *Meal_ID*
    - **age** - *GartenSystem,* table *Person,* column *DateOfBirth*

3. Compare the number of meals sold of different types in an analyzed month relative to the previous month
    - **number of meals** - *GartenSystem*, table *Eating*, column *Meal_ID*
    - **type of meal** - *GartenSystem,* table *Meal,* columns *FirstCourse & Second Course*
    - **date** - *GartenSystem,* table *Meal,* column *Meal_Date*
4. What is the difference in number of children eating in school between the seasons?
    - **number of children** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **date** - *GartenSystem,* table *Meal,* column *Meal_Date*
5. Compare the number of children between weekdays
    - **number of children** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **weekday** must be collected from an external source of data (e.g. Google Calendar)
6. Compare the number of kids eating annually in relation to kindergarten size, defined as the number of kids attending kindergarten, in the current and previous month.
    - **number of children** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **size of kindergarten** - *GartenSystem,* table *Kindergarten,* column *NrOfStudents*
    - **date** - *GartenSystem,* table *Meal,* column *Meal_Date. We count current and previous month.*
7. What is the percentage of children who bring their own lunch to school versus those who eat at the canteen?
    - **number of children eating in canteen** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **number of children bringing their own lunch** - there is no info about that in both data sources. Proposals for acquiring data:
        - carrying out a survey and asking parents if they are making them lunches to school.

Analytical problem: “Why there are changes in the amount of food wasted?”

1. What are the differences in the number of children between months?
    - **number of children** - *GartenSystem,* table *Eating,* column *Student_ID*
    - **date** - *GartenSystem,* table *Meal,* column *Meal_Date*
2. Which meals cause a higher amount of food wasted than on average?
    - **meal type** - *GartenSystem,* table *Meal,* column *FirstCourse & SecondCourse*
    - **amount of food wasted** - *Food* Excel File, column B (Amount of food thrown out)
    - **date** - *Food* Excel File, column A (Date)
3. How the taste of food affects the amount of food wasted?
    - **amount of food wasted** - *Food* Excel File, column B (Amount of food thrown out)
    - **taste of food** - there is no information available in either of the data sources. The proposal to collect data is to perform a survey each month to find the taste of food.

4. Compare the number of meals served the day before and the number of food wasted in that day?
    - **number of meals** - *GartenSystem,* table *Eating*, column *Meal_ID*
    - **day** - *GartenSystem,* table *Meal,* column *Meal_Date*
    - **amount of food wasted** - *Food* Excel File, column B (Amount of food thrown out)
5. Compare the amount of money invested to buy products daily to amount of food thrown out.
    - **amount of money invested** - *Food* Excel File, column D (Money invested to buy products)
    - **amount of food wasted** - *Food* Excel File, column B (Amount of food thrown out)
6. Compare the effect of the popularity of meal to the amount of food wasted.
    - **number of meals (popularity)** - *GartenSystem,* table *Eating*, column *Meal_ID*
    - **amount of food wasted** - *Food* Excel File, column B (Amount of food thrown out)

It is not possible to build a BI system to support a Kindergarten in solving these analytical problems without introducing some changes. We suggest creating a survey system and collecting data about food taste every month. This questionnaire should contain these questions:

- How do you rate the taste of food this week? (Answer in range 0-9)
- How do you rate the amount of food given to a single person (Answer in range 0-9) [0 - too little, 5 - ok, 9 - too much]
- Do you have other comments? (Open-ended question with space for 300 signs)

This questionnaire will automatically fill the new Excel Sheet with the answers. The structure of the sheet is as follows:

Column A - TimeStamp
Column B - Taste (0-9)
Column C - Amount (0-9)
Column D - Comments