The diagram has the following entities:

strong entities (customer, case-model, mobile-type).

weak entities (order, performance, quality, availability).

composite entity(order-line).

Customer entity: keeps important data about the manufactory Customers (name, email, mobile, address, and when did they become clients of the manufactory.

Order entity:  keeps records about the customer who have made the order (foreign key: customer-id) and on what date has the order been created.

Mobile type entity: save data about mobile type that the manufactory makes cases for.

Case-model entity: keeps information about the different design that the manufactory produces (number of the case model and a short description of the design).

A bridge entity(order line): has been used to break down the many to many relationships between order with (mobile type and case-model), it has an amount attribute to keep track of items number that, the client ordered from each mobile and case-type.

The assumptions made before the design:

The system will retrieve data from plc every 10 minutes; therefore all the parameters will be calculated in a 10 minutes interval.

The planned production time is 8 horses per day which means 480 minutes

The estimated time to produce one item is one minute.

For production monitoring four entities have been added:

Availability entity: plannedProductionTime attribute has int type from 0 to 480 it will be incremented by 10 for each row,

runningTime attribute of int type less than 480 and will be retrieved from the plc every 10 minutes. It will store for how long has the manufactory been working from the beginning of each working day till the end of each working day, the date attribute of type timestamp stores when the value has been retrieved from the monitoring points.

Quality entity: goodProducts attribute stores the number of the good items that has been produced during the last period, totalProduct attributes is the number of all the item that has been produced throughout the day.

Performance entity: theoreticalOutput attribute, is how many items should the manufactory produce in 10 minutes, it will also be incremented by 10 for each row, the actual output is how many items did the manufactured produced in total from 8.00 am till the current time.

The last one is the EEO (overall equipment efficiency) will be calculated every 10 minutes by multiplying availability, quality and performance.

The value for availability will be calculated from the following equation

(Run Time / Planned Production Time x 100, Run time is the planned production time - stop time) and finally.

The value for performance will be calculated by dividing the number of actual items produced by the number of the theatricalOutput produced and multiplying the result by a 100

The value for quality will be calculated by dividing number of the good product by the number of total produced products and multiply the rest by 100,