hroug annual conference '23

Track 9 ¾ or the magic of data modelling

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Agile

Lets do it step by step

Each journy starts with the first step

Source: https://ampaevents.com/product/hogwarts-platform-9-3-4-sign/

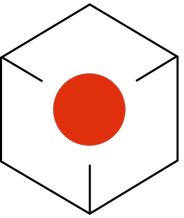
Vision

We want design a data model, that represents the information of the real world as simply as possible and yet as precise as possible.

To do this, we work together with a specialist

We, Katrin and Andrea, are Muggles
who do the modelling together with
a witch from the Ministry.
We proceed iteratively

Source: https://de.freepik.com/fotos-vektoren-kostenlos/hexe



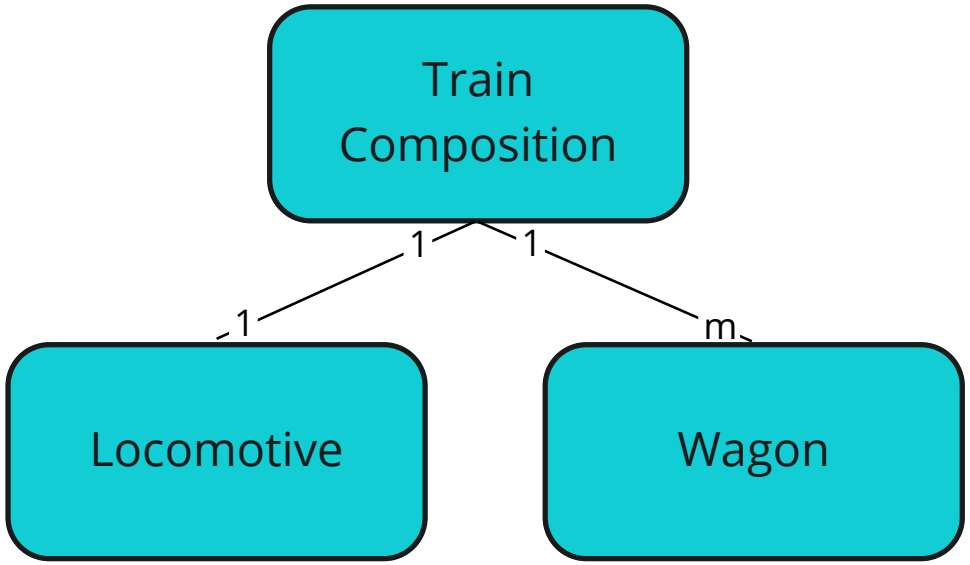
Goal

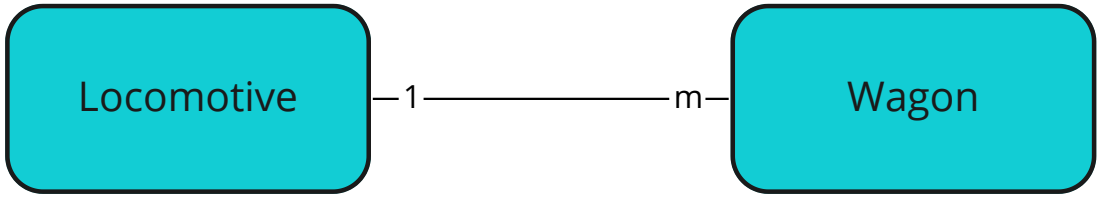
Our goal is to model the **train compositions** of the Hogwarts Express with all the **journeys** that occur, in order to ultimately manage them in an Oracle database.

Iteration 1 Problem definition

- The first step is to be able to capture simple **train compositions** with one **locomotive** and several **wagons**
- A train composition is made up of a locomotive and several wagons

Iteration 1: Solution a and b



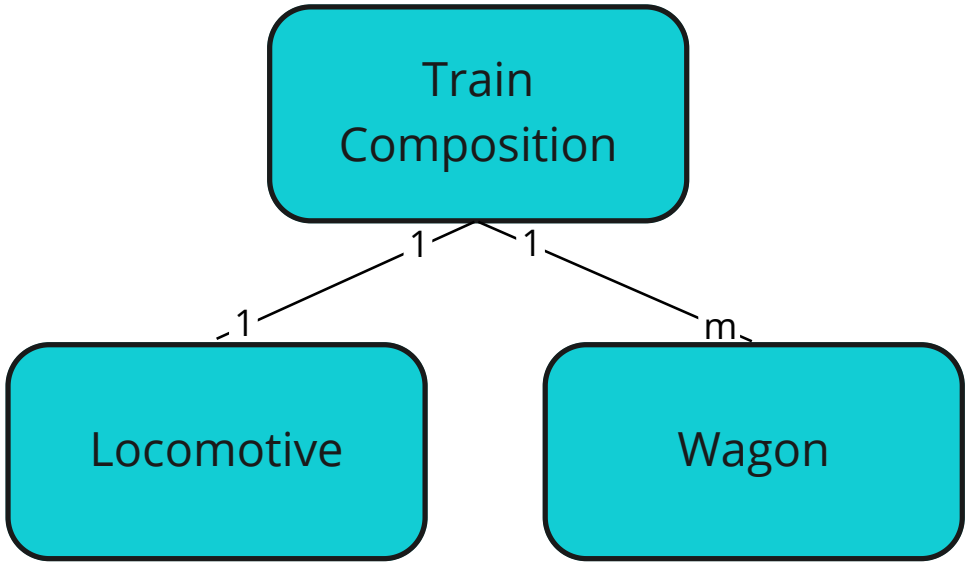


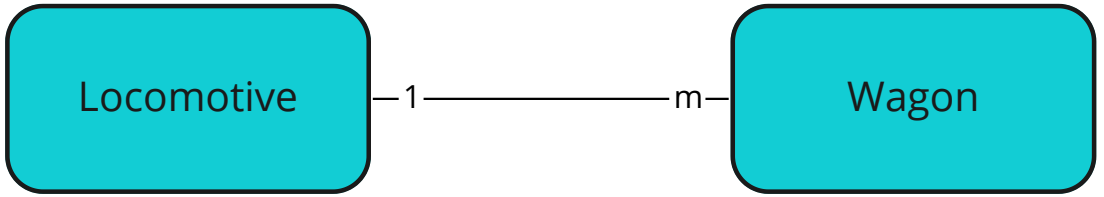
Better not 1:1 ➔ Solution b is preferred

Iteration 2 Problem definition

- There are different train compositions
- One and the same wagon can appear in different train compositions
- The same applies to locomotives
- A wagon in a train composition is called a composition unit.
- **Composition units** are numbered to indicate their position in the train composition

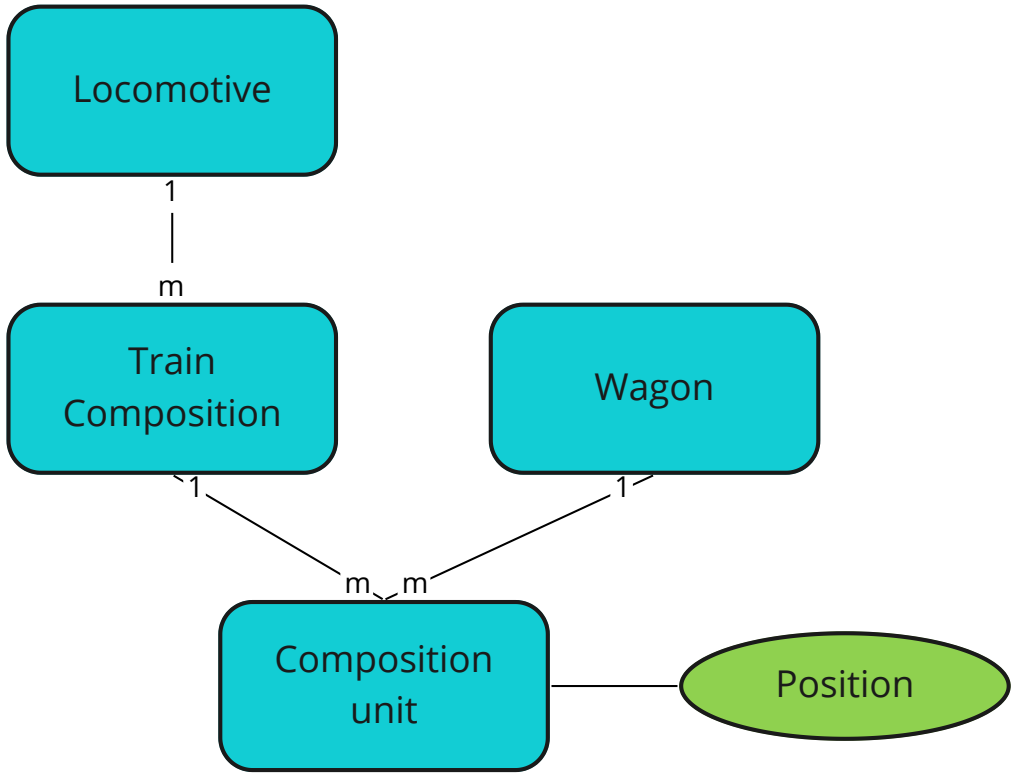
Iteration 1: Solution a and b

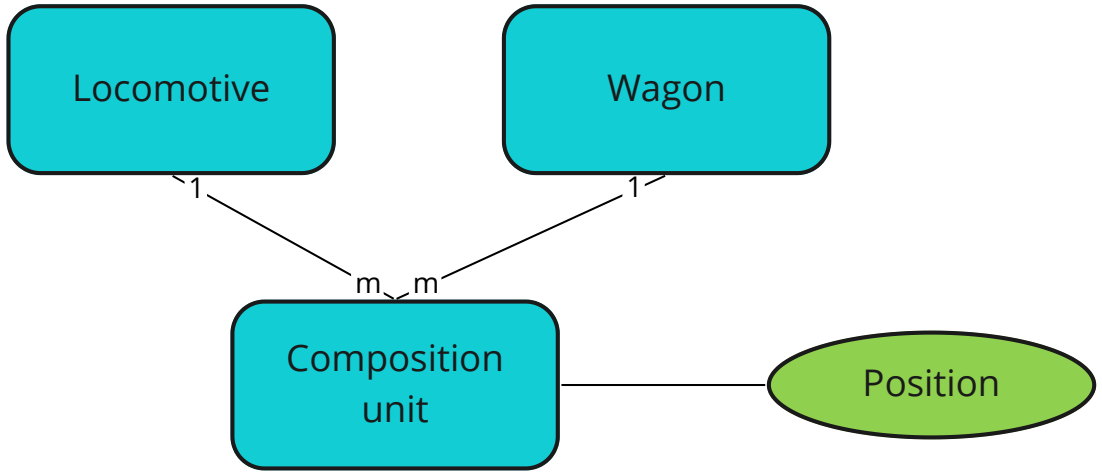




Better not 1:1 ➔ Solution b is preferred

Iteration 2: Solution a and b





Iteration 2: Data example

Locomotive	Wagon	Position	Train Composition
Back	Green	1	Irland
Back	White	2	Irland
Back	Orange	3	Irland
Back	Blue	1	Frankreich
Back	White	2	Frankreich
Back	Red	3	Frankreich

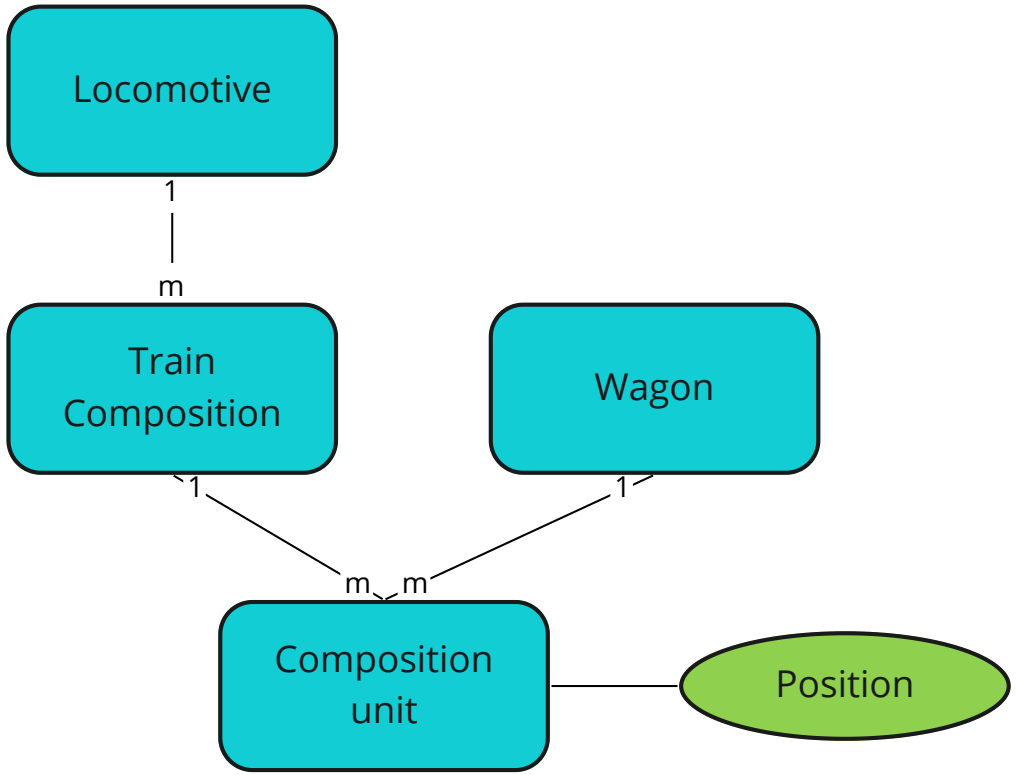
Locomotive	Wagon	Position
Back	Green	1
Back	White	2
Back	Orange	3
Back	Blue	1
Back	White	2
Back	Red	3

On the right it is not clear which combination belongs to which composition.
Therefore, the entity train composition makes sense ➔
Solution **a** is preferred

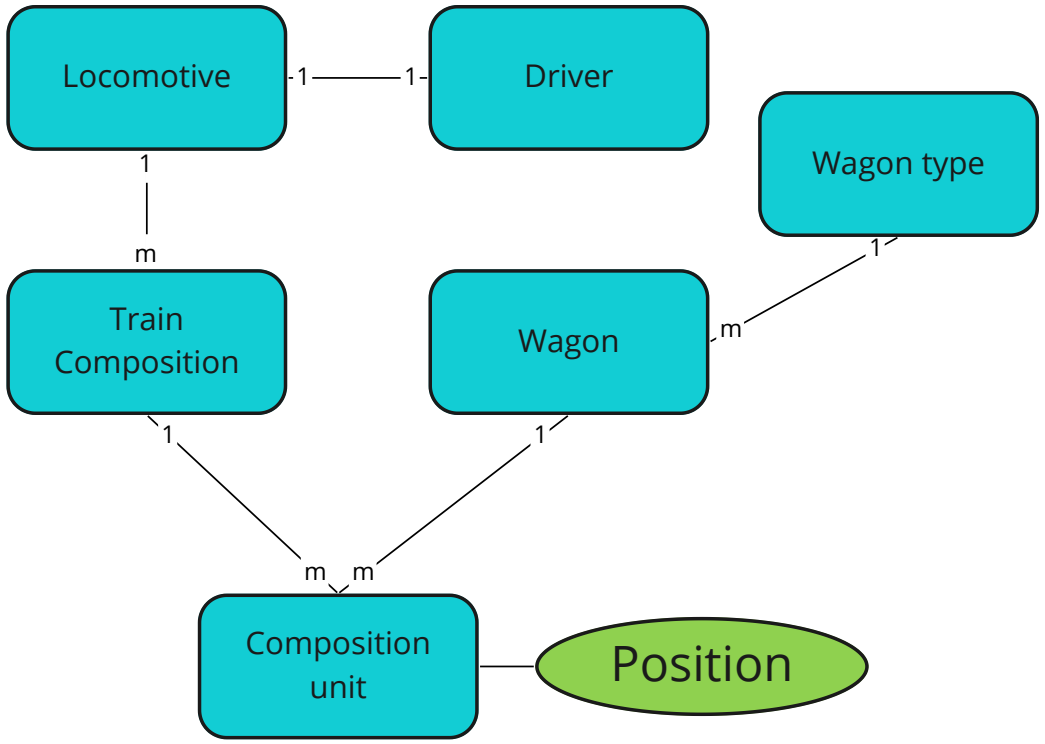
Iteration 3 Problem definition

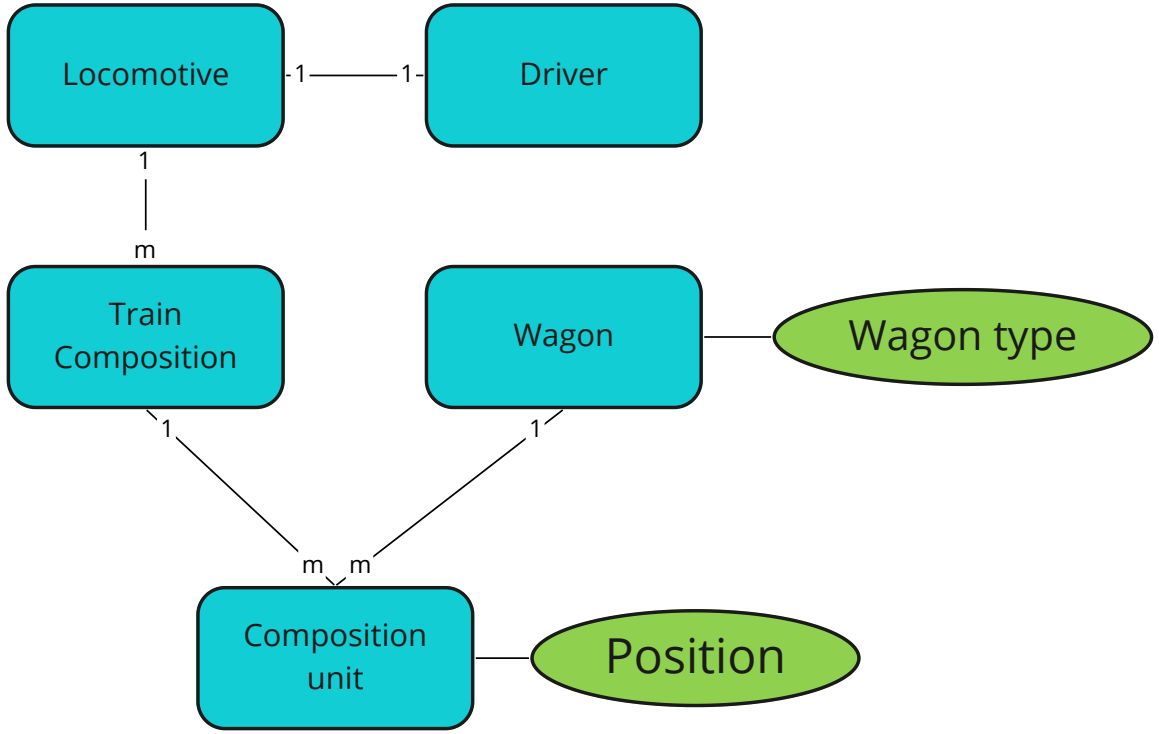
- Position 1 is always locomotive with driver
- Driver only drives own locomotive
- Locomotive can only have 1 driver
- Different goods and magic students are transported
- Wagons are for goods, passenger or dining cars
- Definition of wagon: each individual wagon
- Definition locomotive: each individual locomotive

Iteration 2: Solution a



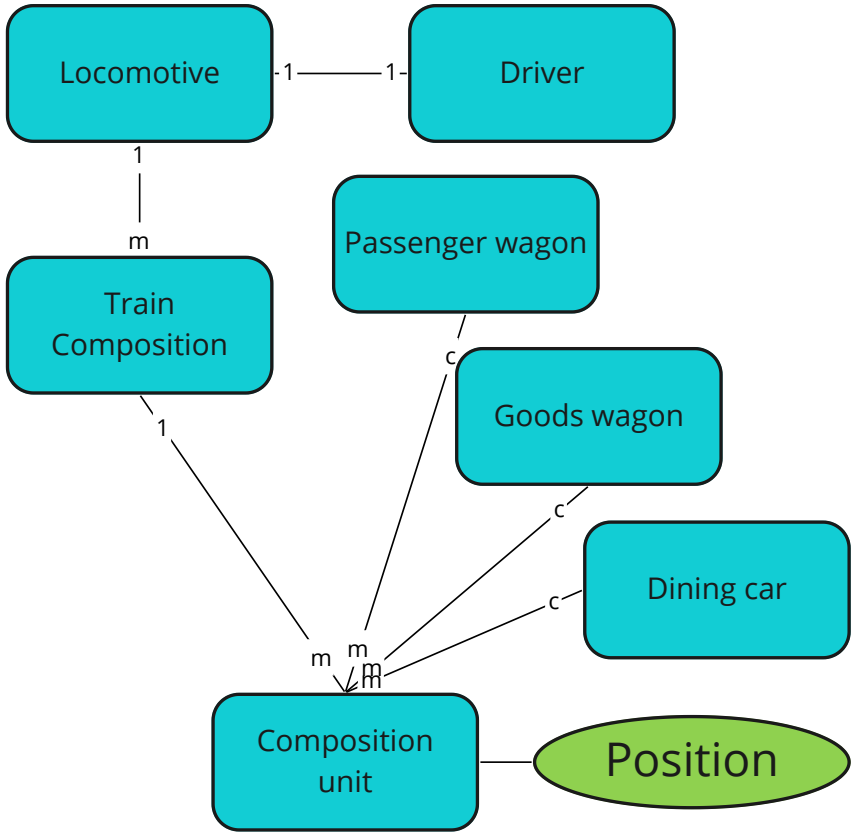
Iteration 3: Solution a and b

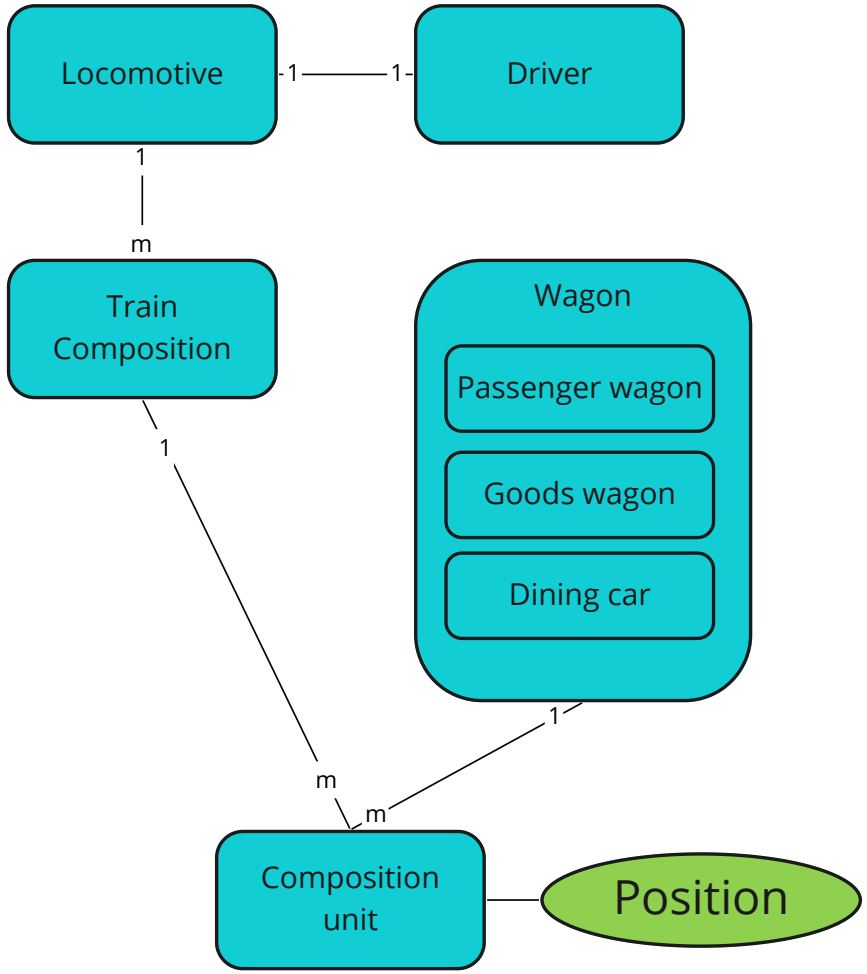




Wagon type has only one attribute Solution ➔
Solution b is preferred

Iteration 3: Solution c and d



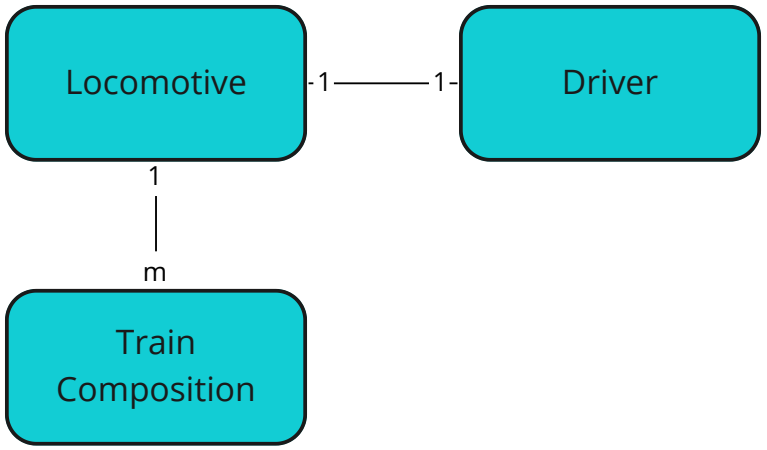


Wagon types have common and own attributes

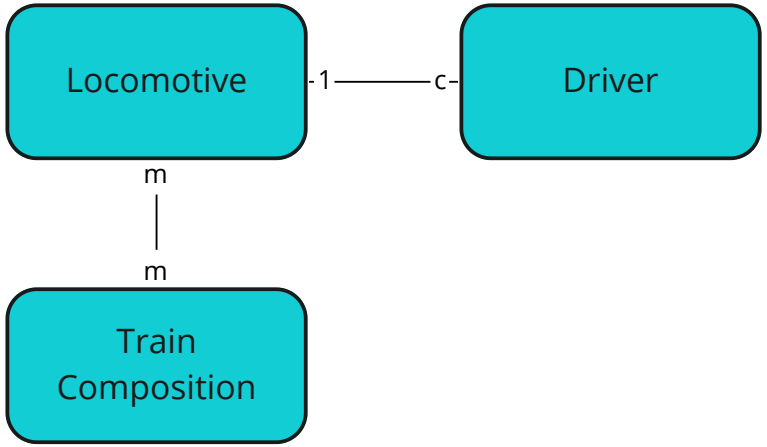
➔ Solution d

Iteration 4 Problem definition

- A train composition can have several locomotives
- Only the first locomotive has a driver

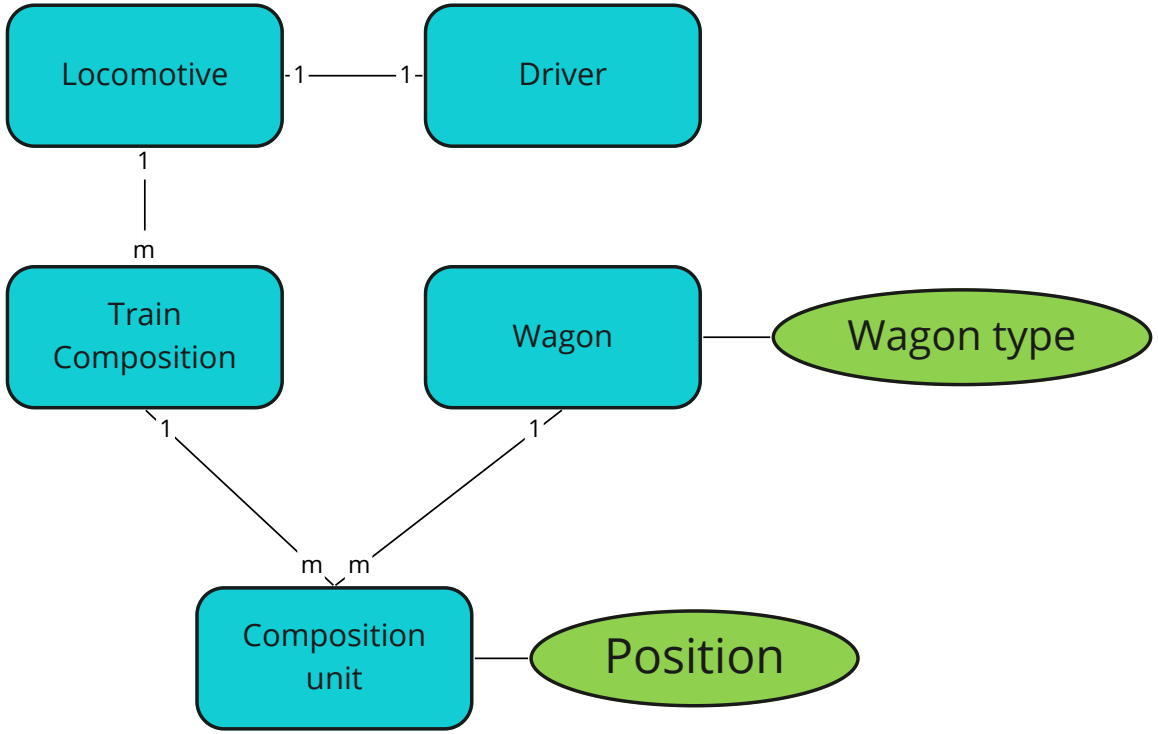


old

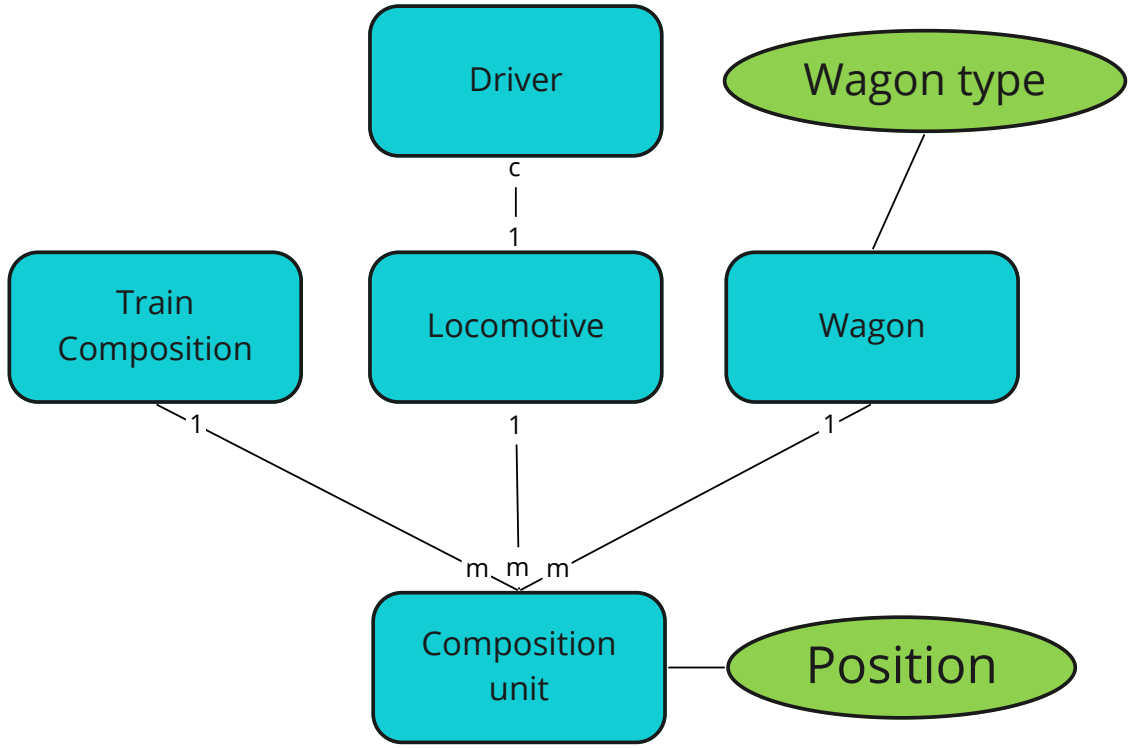


new

Iteration 4:
Solution based on 3b

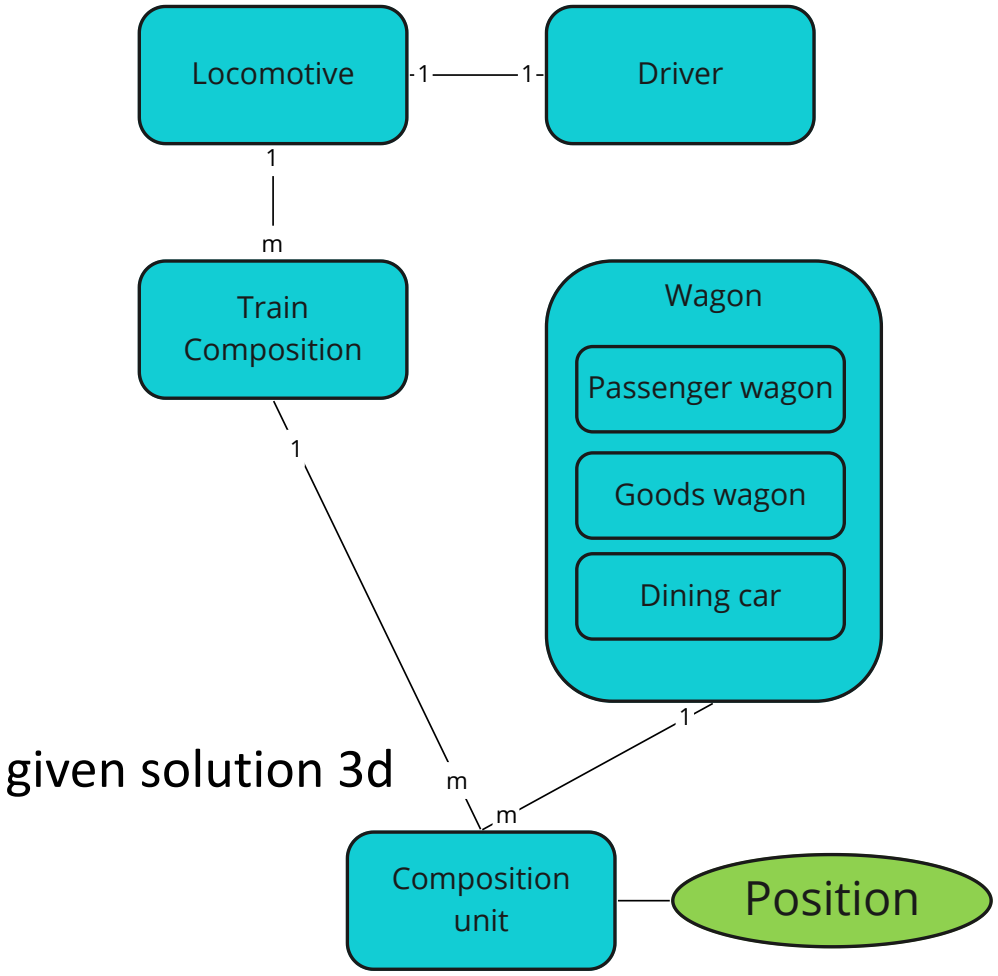


given solution 3b

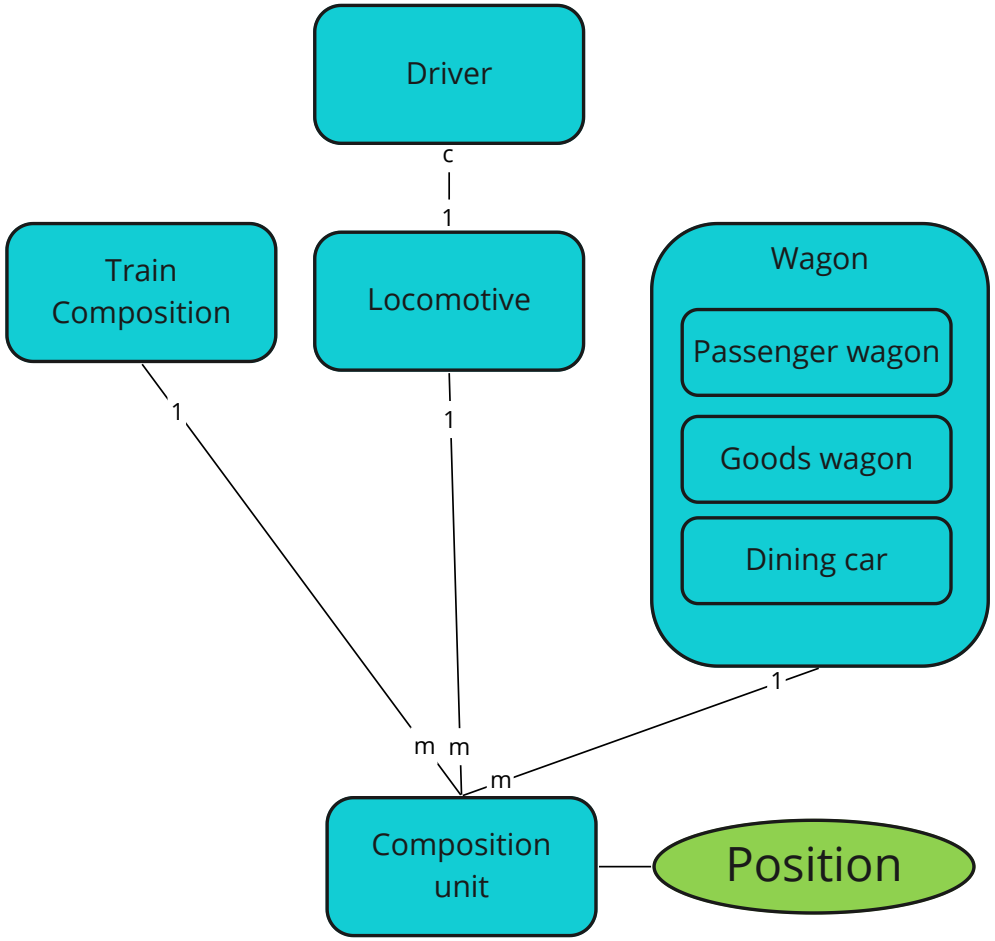


new solution 4b

Iteration 4: Solution based on 3d

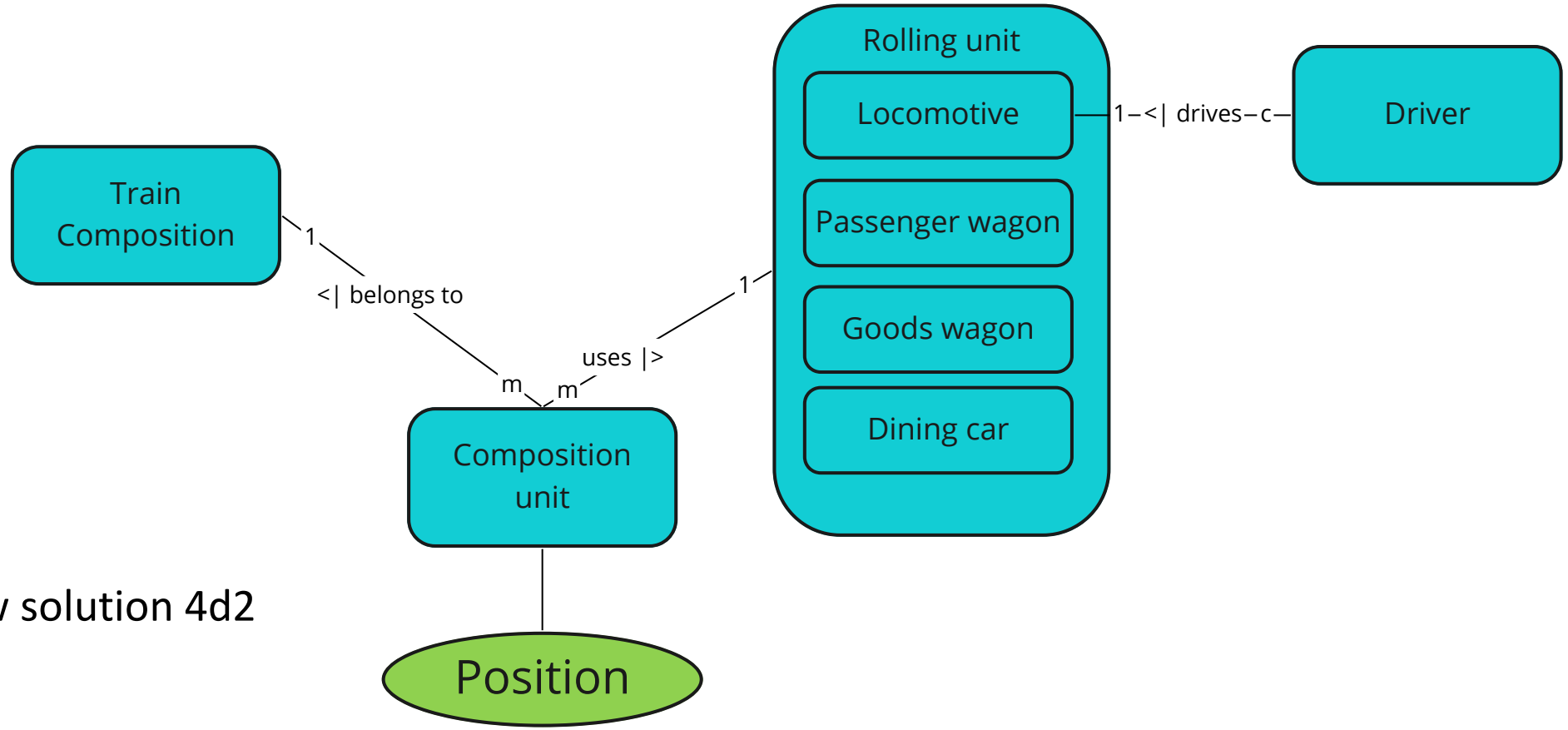


given solution 3d



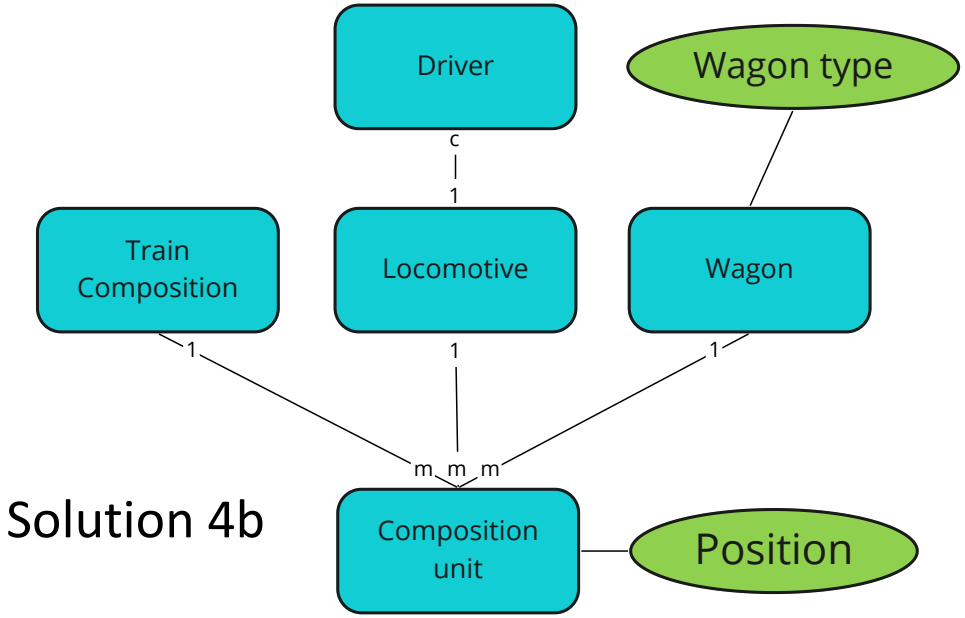
new solution 4d1

Iteration 4: Solution based on 3d

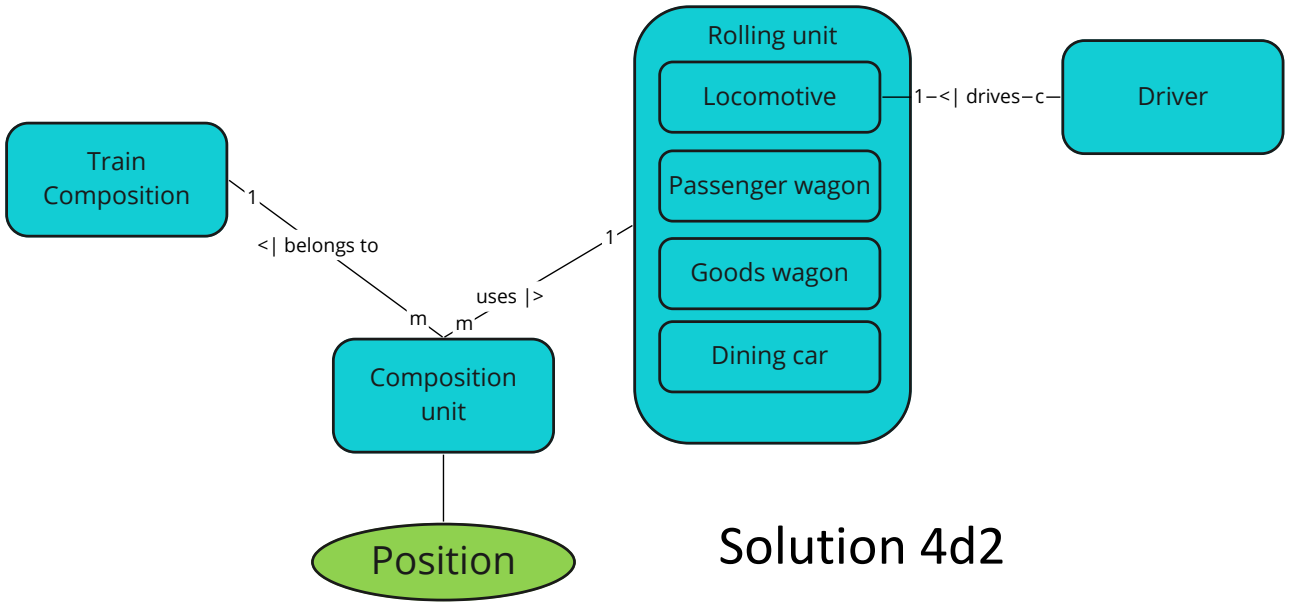


New solution 4d2

Iteration 4: Solution based on 3b and d



Solution 4b



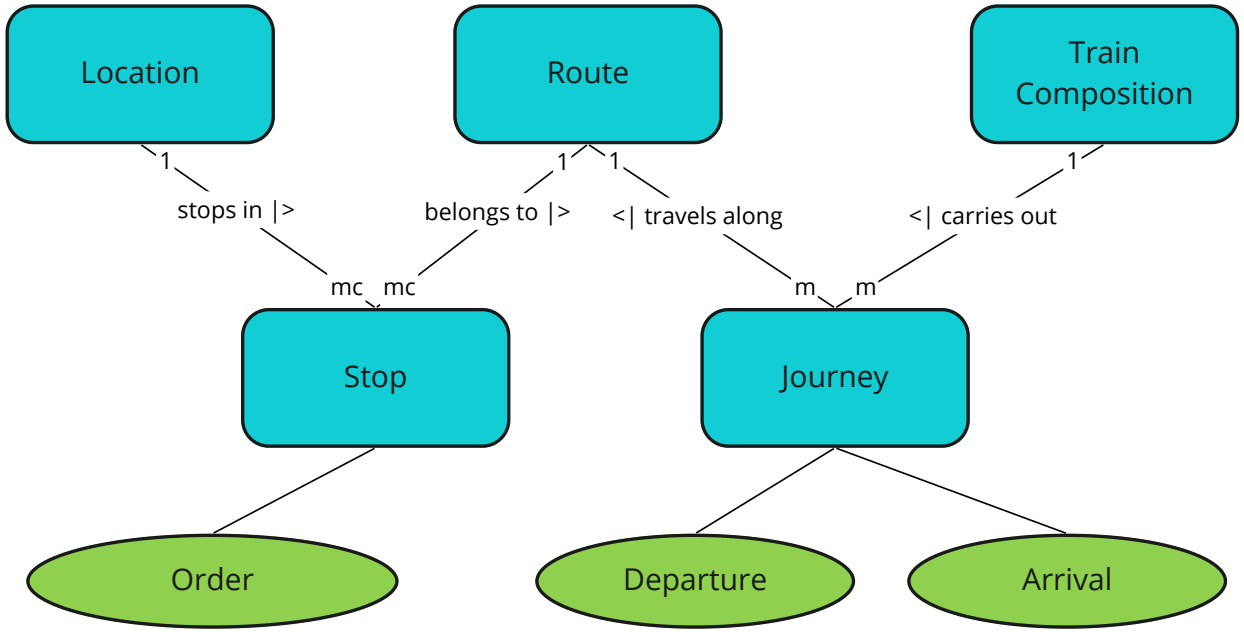
Solution 4d2

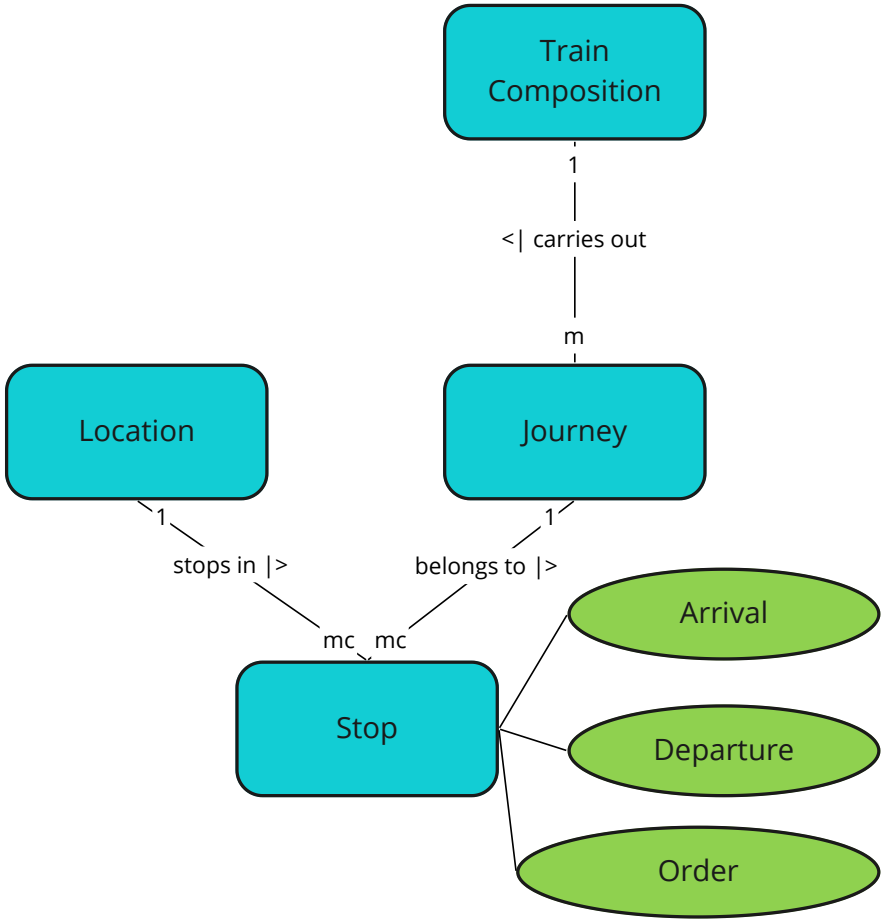
Locomotive must be considered separately.
We assume that wagon types are important and take the solution on the right as a further basis

Iteration 5 Problem definition Timetable

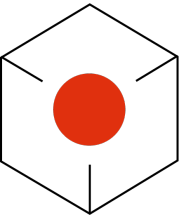
- Hogwarts Express trains run irregularly.
- We want to track every **journey** that is planned and made.
- We want to know which train composition **stops** at which **locations** in which order, including **arrival and departure time** for each place.
- The arrival and departure times for the start and destination locations are empty.

Iteration 5: Solution a and b





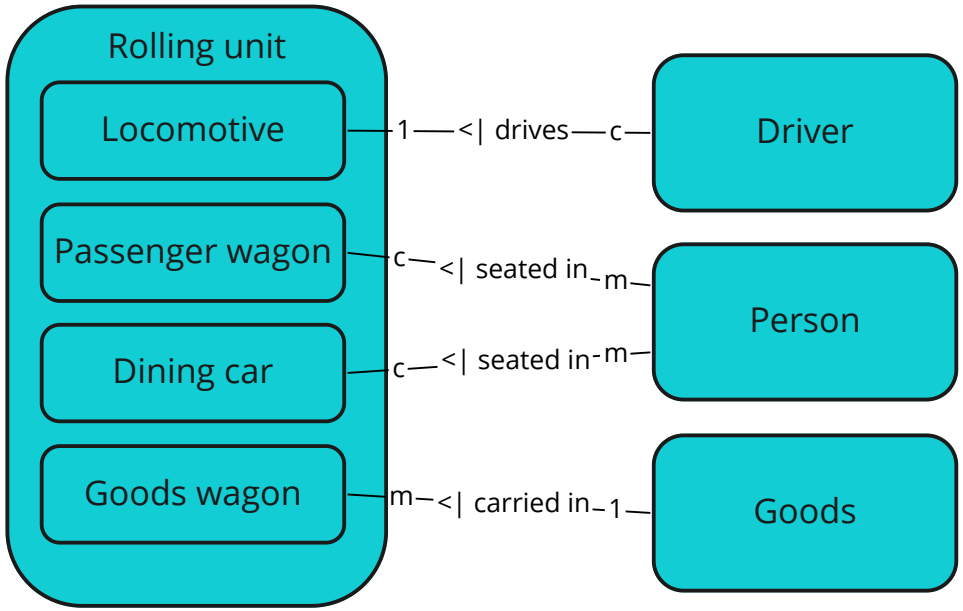
Arrival and departure per location for each individual journey is important ➔ Solution b is preferred



Iteration 6 Problem definition

- Now we also want to record who and what is being transported per journey
- Only one type of goods can be transported in a wagon, so we must not mix goods.
- Goods often have to be distributed over several wagons
- A person has his or her place in exactly one passenger wagon or dining car.
- However, there is room for more than one person in a passenger wagon or dining car.

Iteration 6: Solution

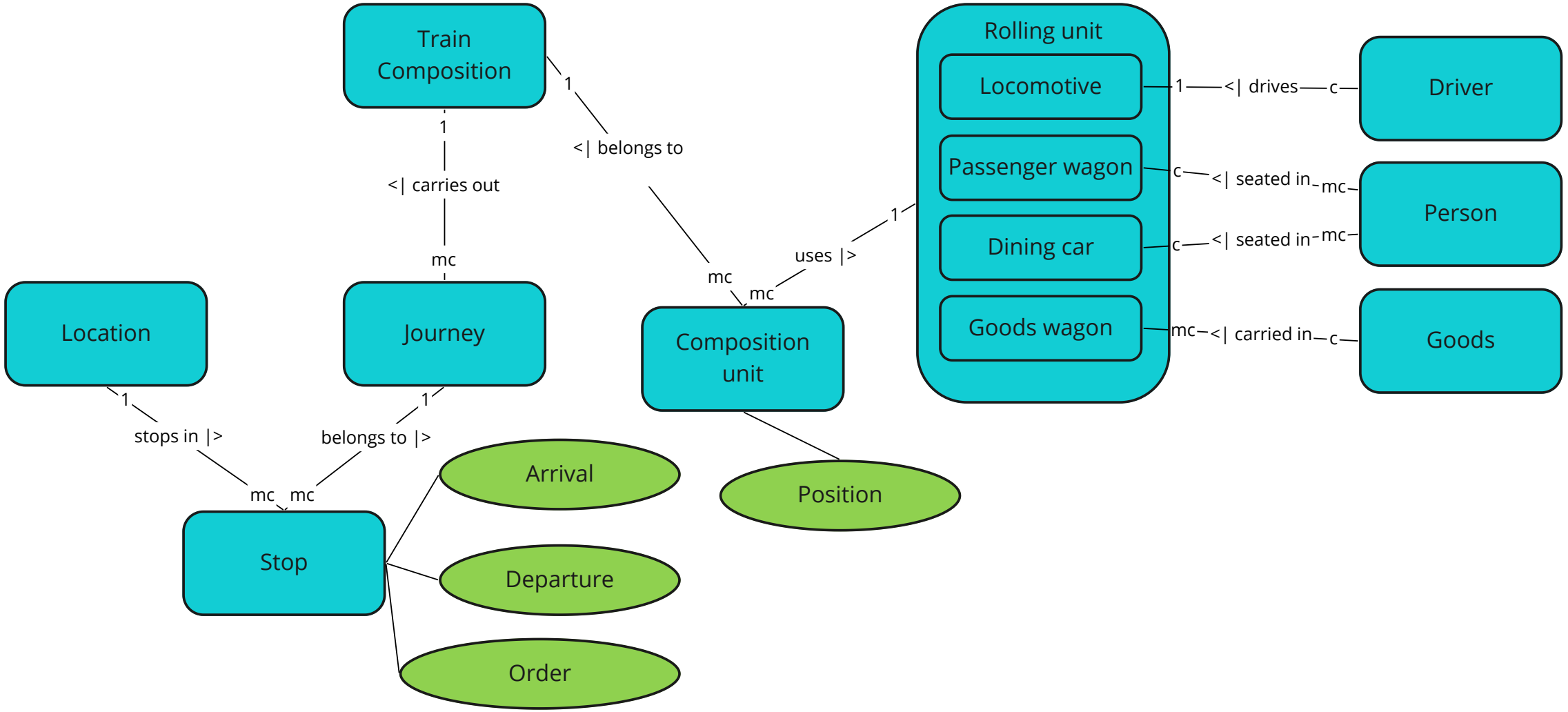


Good that we had chosen the solution with the types, otherwise we would have to bring this out now.

Iteration 7 Problem definition

- Check relationships and assembly the model
- Goods exist without goods wagons
- Passenger wagons and dining cars can also be empty
- Train composition and rolling stock unit is defined before they are merged via composition unit
- A train composition exists even without a journey

Iteration 7: Solution



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