please describe in general how data is transferred from one data layer to another, and what is purpose of added data layer

In general ERD is for transaction processing. Datavault is the main warehouse. Dimensional model is for easier querying and analysis of data.

Data is first loaded usually to a staging area and then on to the datavault and to dimensional model.

In data vault, the data is never updated, instead changed data is inserted with a new loaded_at time. All the hubs can be loaded in parallel, as can all the links and satellites.

In datavault 2.0 the business keys are loaded first into the hub and the record is given a PK as the calculated hash of the business key columns.

The hub's surrogate key is compared to the calculated hash of the incoming rows business keys and if the record doesn't exist yet, it is inserted.

Satellites have a hash_diff column, which is a calculated hash of all the attributes and can be compared to the calculated hash of all the incoming rows. Defaults should be used for NULL values so that incoming data doesn't get lost.

In the datavault, the HUBs record the first time a business key has reached the system and these don't change. Changing attributes are captured in satellites.

In the dimensional model records are inserted with a start_date and if the record gets an update in source then the previous dimensional model record gets and end_date and the record with new info gets a start_date.