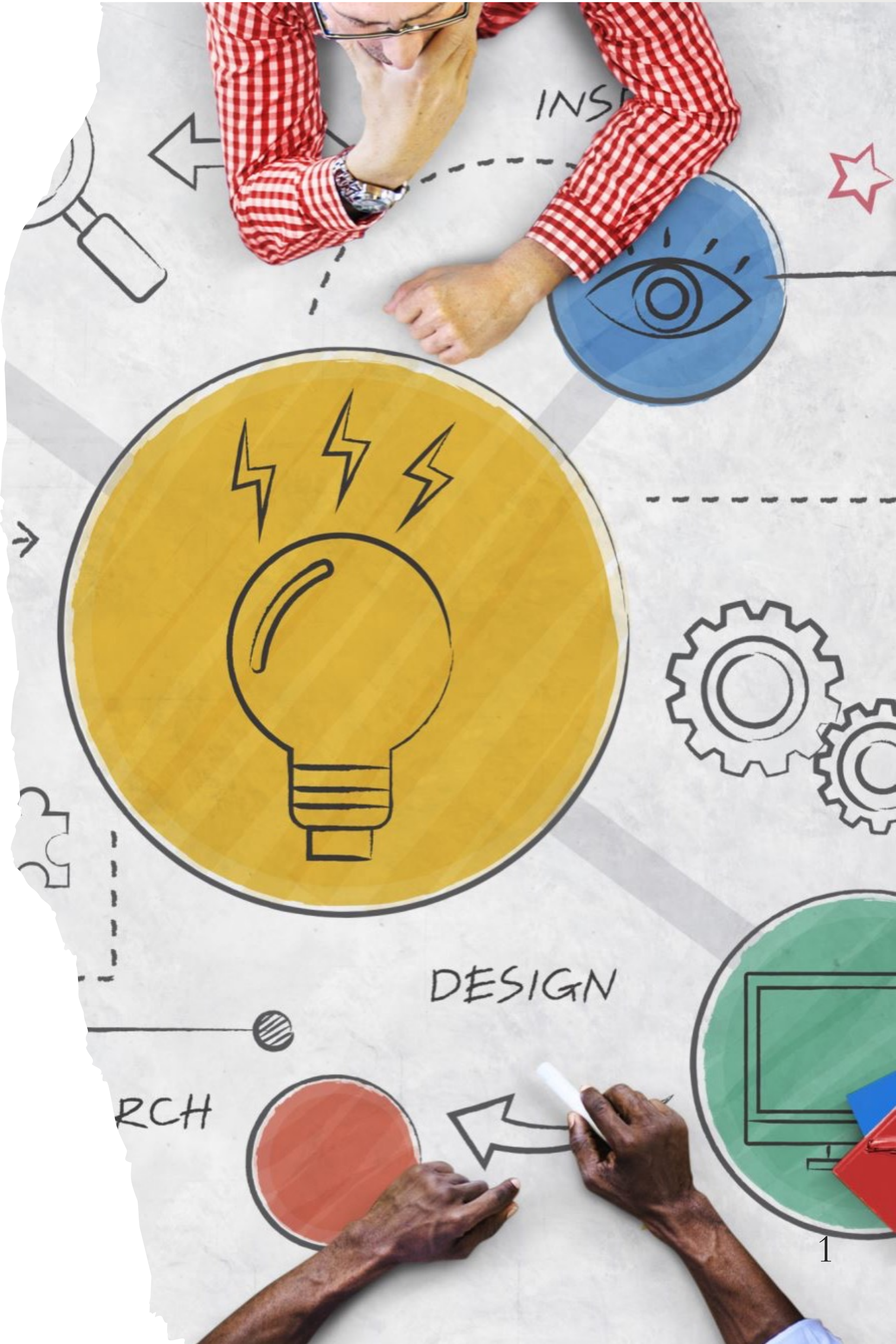
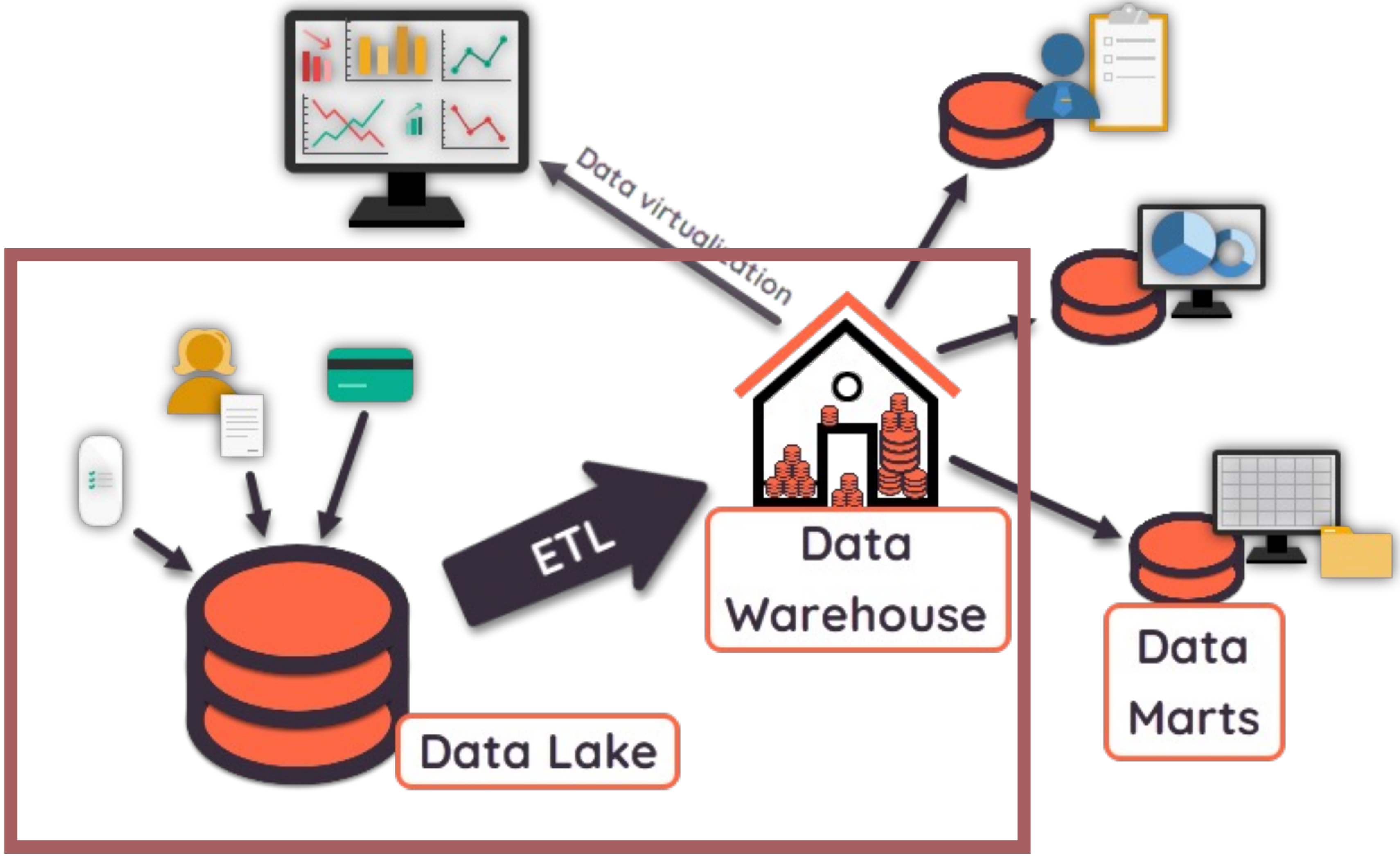
DATAVAULT

DATA ENGINEERING BOOTCAMP

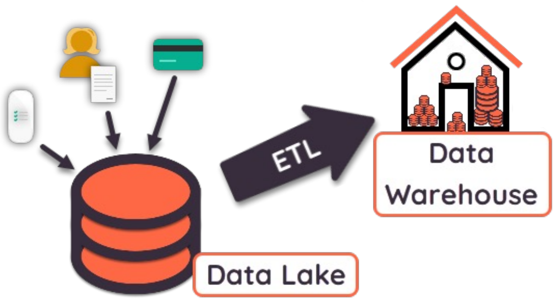


WHAT IS ETL ?


Data virtualization
ETL
Data Warehouse
Data Lake
Data Marts

HOW DO WE TRACK CHANGES OF OUR SOURCE DATA OVER TIME?

WHAT IS A DATAVAULT ?



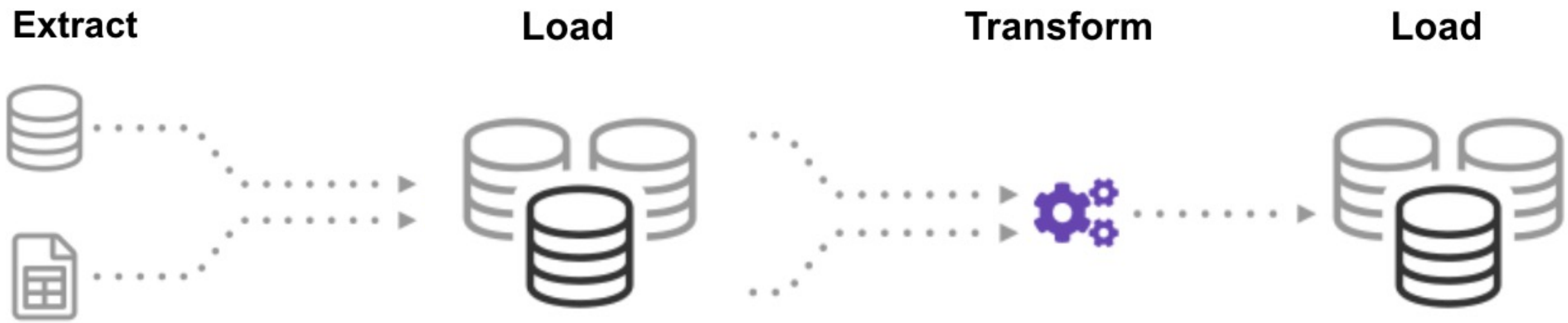


Image: https://panoply.io/uploads/etl-1.png

MODEL

```
crops:
+------+----------+-------------------+
| id   | crop     | water_consumption |
+------+----------+-------------------+
| C-1  | tomato   | 10                |
+------+----------+-------------------+
| C-2  | cucumber | 15                |
+------+----------+-------------------+

fields:
+------+-------+----------+
| id   | field | crop_id  |
+------+-------+----------+
| F-5  | small | 2        |
+------+-------+----------+
| F-6  | big   | 1        |
+------+-------+----------+
```

Tomatos now have a water consumption of 12 liters/day.

How can we communicate our stakeholders that yesterdays analysis contained a different value?

SATELITE

```
crops satelite:
+---------------+----------+-------------------+------------+----------+---------------+-----------+
| crop_hash_key | crop     | water_consumption | load_date  | end_date | record_source | hash_diff |
+---------------+----------+-------------------+------------+----------+---------------+-----------+
| b519e         | tomate   | 10                | 2022-05-01 | NULL     | ERP           | 8a3f0     |
+---------------+----------+-------------------+------------+----------+---------------+-----------+
| 5f763         | cucumber | 15                | 2022-05-01 | NULL     | ERP           | c345a     |
+---------------+----------+-------------------+------------+----------+---------------+-----------+
```

```
crops:
+------+----------+-------------------+
| id   | crop     | water_consumption |
+------+----------+-------------------+
...
+------+----------+-------------------+
```

ALTER DATA

```
crops satelite:

+---------------+----------+-------------------+------------+------------+---------------+-----------+
| crop_hash_key | crop     | water_consumption | load_date  | end_date   | record_source | hash_diff |
+---------------+----------+-------------------+------------+------------+---------------+-----------+
| b519e         | tomate   | 10                | 2022-05-01 | 2022-05-02 | ERP           | 8a3f0     |
+---------------+----------+-------------------+------------+------------+---------------+-----------+
...
+---------------+----------+-------------------+------------+------------+---------------+-----------+
| b519e         | tomate   | 12                | 2022-05-02 | NULL       | ERP           | 8a3f0     |
+---------------+----------+-------------------+------------+------------+---------------+-----------+
```

- ✅ Tracking data changes
- ✅ Only import differences

ADD COLUMN

crops height satelite:

```
+-----------------+-------------+------------+----------+---------------+-----------+
| height_hash_key | crop_height | load_date  | end_date | record_source | hash_diff |
+-----------------+-------------+------------+----------+---------------+-----------+
| 74f10           | 30          | 2022-05-03 | NULL     | ERP           | a8c94     |
+-----------------+-------------+------------+----------+---------------+-----------+
| d9570           | 15          | 2022-05-03 | NULL     | ERP           | ef3a9     |
+-----------------+-------------+------------+----------+---------------+-----------+
```

crops - crops height link:

```
+---------------------------+---------------+----------------------+------------+---------------+
| crop_crop_height_hash_key | crop_hash_key | crop_height_hash_key | load_date  | record_source |
+---------------------------+---------------+----------------------+------------+---------------+
| 05610                     | b519e         | 74f10                | 2022-05-03 | ERP           |
+---------------------------+---------------+----------------------+------------+---------------+
| 2c61c                     | 5f763         | d9570                | 2022-05-03 | ERP           |
+---------------------------+---------------+----------------------+------------+---------------+
```

- ✅ Tracking schema changes
- ✅ Downstream ETL processes do not need to be adjusted if they don't need the new information

REMOVE A COLUMN

- All Columns need to be nullable
- Therefore no further changes are needed.

PROS & CONS OF A DATAVAULT

Pros:

- Long-term storage of data
- Tracking data changes
- Fast import of data
- Changes in data schemas do not necessarily required downstream ETL and analysis processes to be adjusted

Cons:

- Not easy to query
- Large overhead

HOW DO WE TRACK CHANGES OF OUR SOURCE DATA OVER TIME?

THANK YOU FOR YOUR ATTENTION