DATA QUALITY

DATA QUALITY FRAMEWORK PART 1

DATA QUALITY IS A PROCESS

There are three focus areas in addressing data quality:

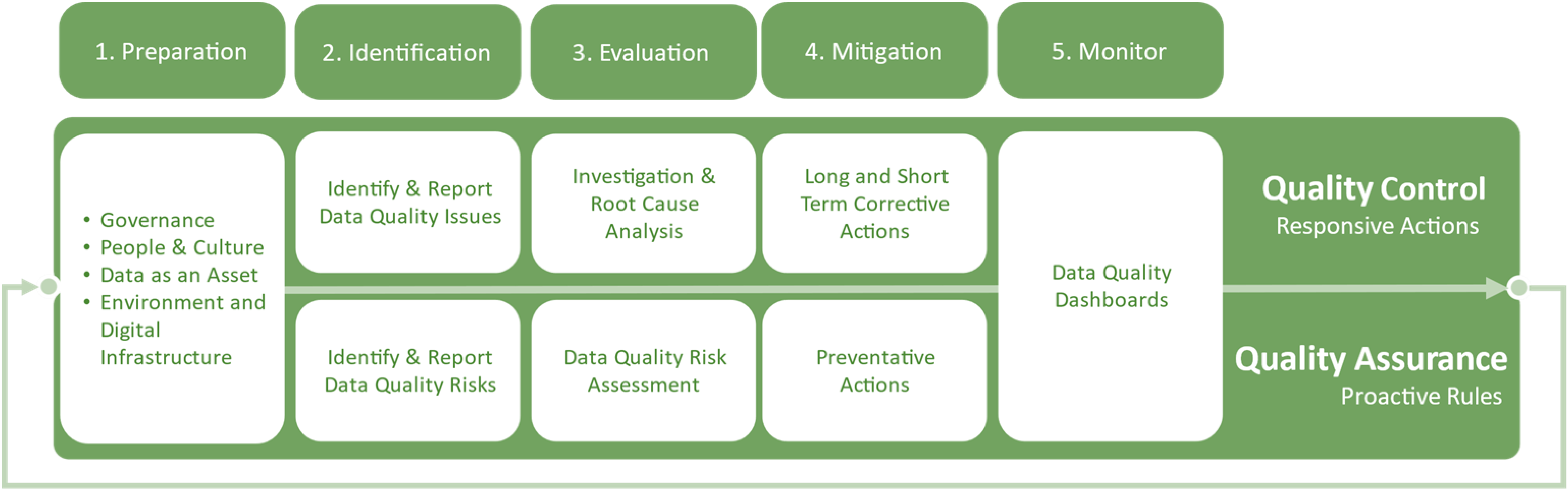
1. identify and mitigate **existing** data quality issues through quality control (e.g., testing a database to identify incorrect values then replacing them);
2. identify sources of high risk that could **create** quality issues and mitigate those risks through quality assurance (e.g., replacing a free form text field on a new software app with a dropdown list), and
3. track and **monitor** all known data quality issues and report them on a regular basis through quality monitoring (e.g., creating a list of all known issues and monitoring when they get fixed).

DATA QUALITY IS A PROCESS

We cannot implement a **data quality program** all at once, so we typically break it down to 5 stages:

1. preparation
2. issue and risk identification
3. issue and risk evaluation
4. issue and risk mitigation
5. ongoing monitoring

DATA QUALITY IS A PROCESS



1. Preparation

- Governance
- People & Culture
- Data as an Asset
- Environment and Digital Infrastructure

2. Identification

Identify & Report Data Quality Issues

Identify & Report Data Quality Risks

3. Evaluation

Investigation & Root Cause Analysis

Data Quality Risk Assessment

4. Mitigation

Long and Short Term Corrective Actions

Preventative Actions

5. Monitor

Data Quality Dashboards

Quality Control

Responsive Actions

Quality Assurance

Proactive Rules

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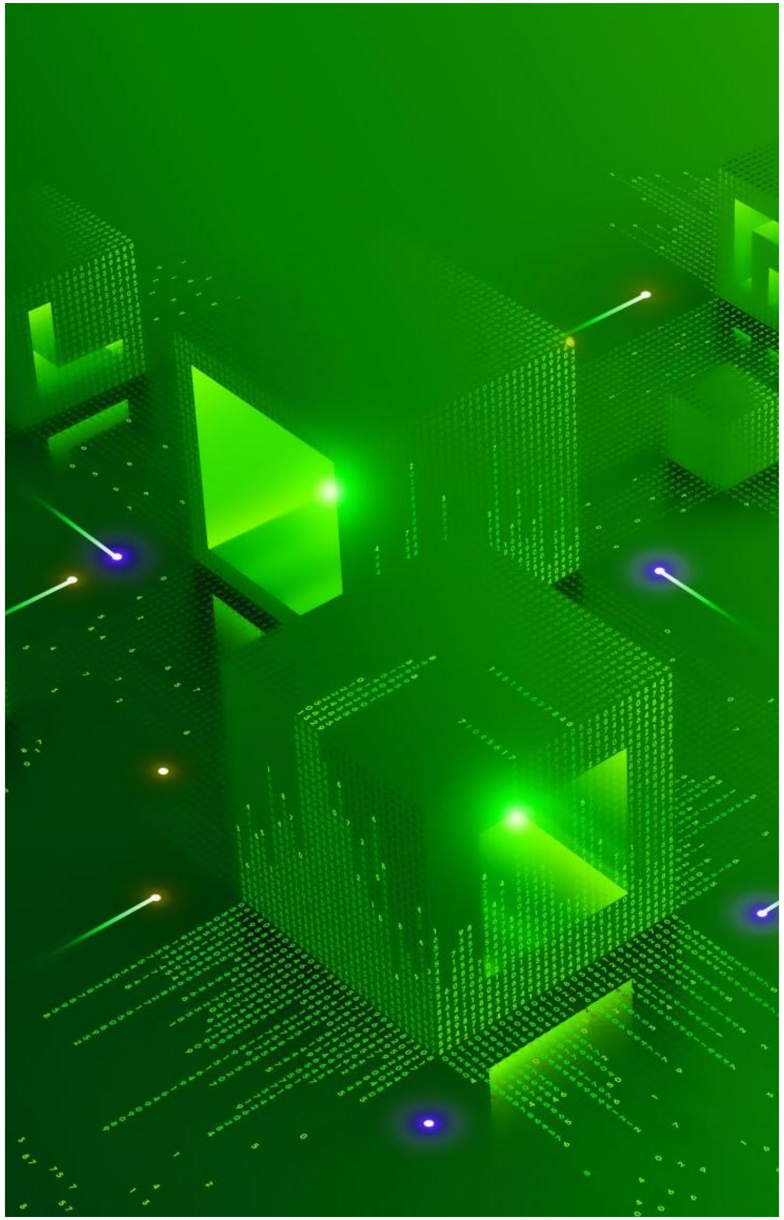


STAGE 1: PREPARATION

We can improve data quality by implementing programs such as:

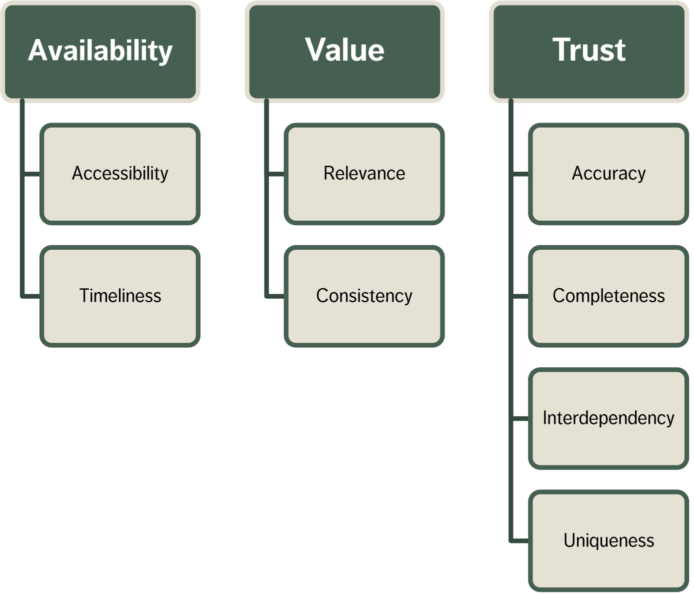
- **People & Culture** (data literacy, culture, and communication)
- **Environment & Digital Infrastructure** (tools, data asset catalogue)
- **Data Management** (metadata, reference/master data, dimensions & rules)
- **Governance** (roles & responsibilities, DQ planning, process definition)

Although it isn't critical to have all the above activities in place before starting on Data Quality, they do make a significant impact on the effectiveness of all DQ activities.

STEP 2: IDENTIFICATION

The second step in the process is to identify **data quality issues**. Currently-existing issues are called **data quality non-conformances**; issues that are yet to appear are known as **data quality risks**.

- DQ dimensions identify data attributes that can be used to measure data quality (often defined in an organization's **Data Quality Framework**).
- Business rules define the **business requirements** for data and how **data quality tests** are performed.
- Data quality metrics track the results of these tests over time.


Availability
Accessibility
Timeliness
Value
Relevance
Consistency
Trust
Accuracy
Completeness
Interdependency
Uniqueness

STAGE 2: IDENTIFICATION METHODS

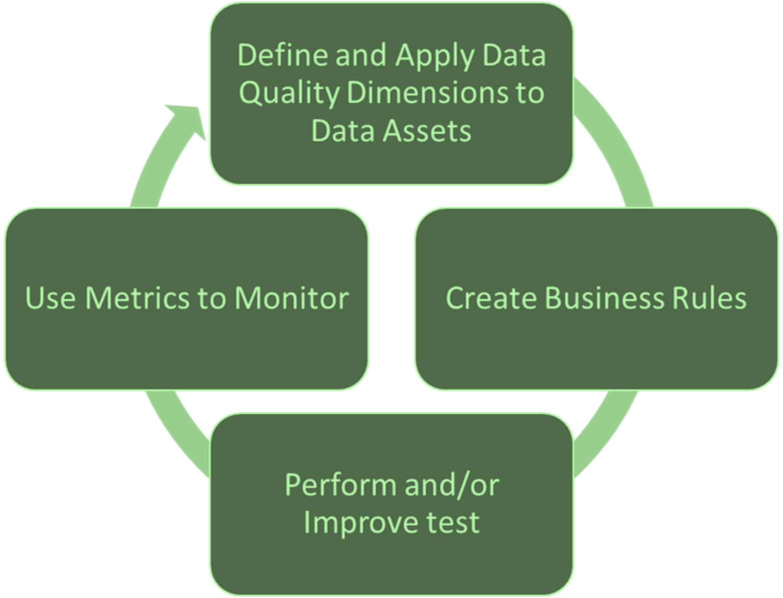
Methods for identifying **DQ non-conformances** and **DQ risks** include:

Quality Control

- DQ testing using software
- systems, process, and procedure auditing
- data consumer feedback

Quality Assurance

- creation of risk register



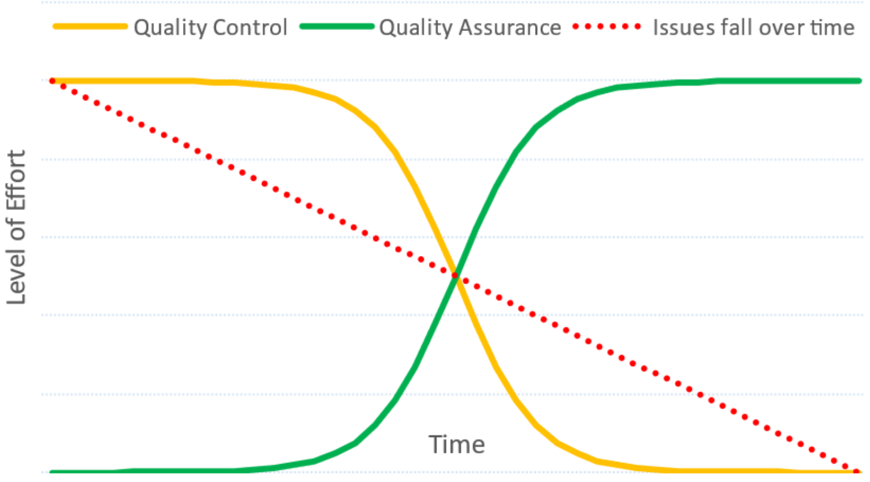
Define and Apply Data Quality Dimensions to Data Assets

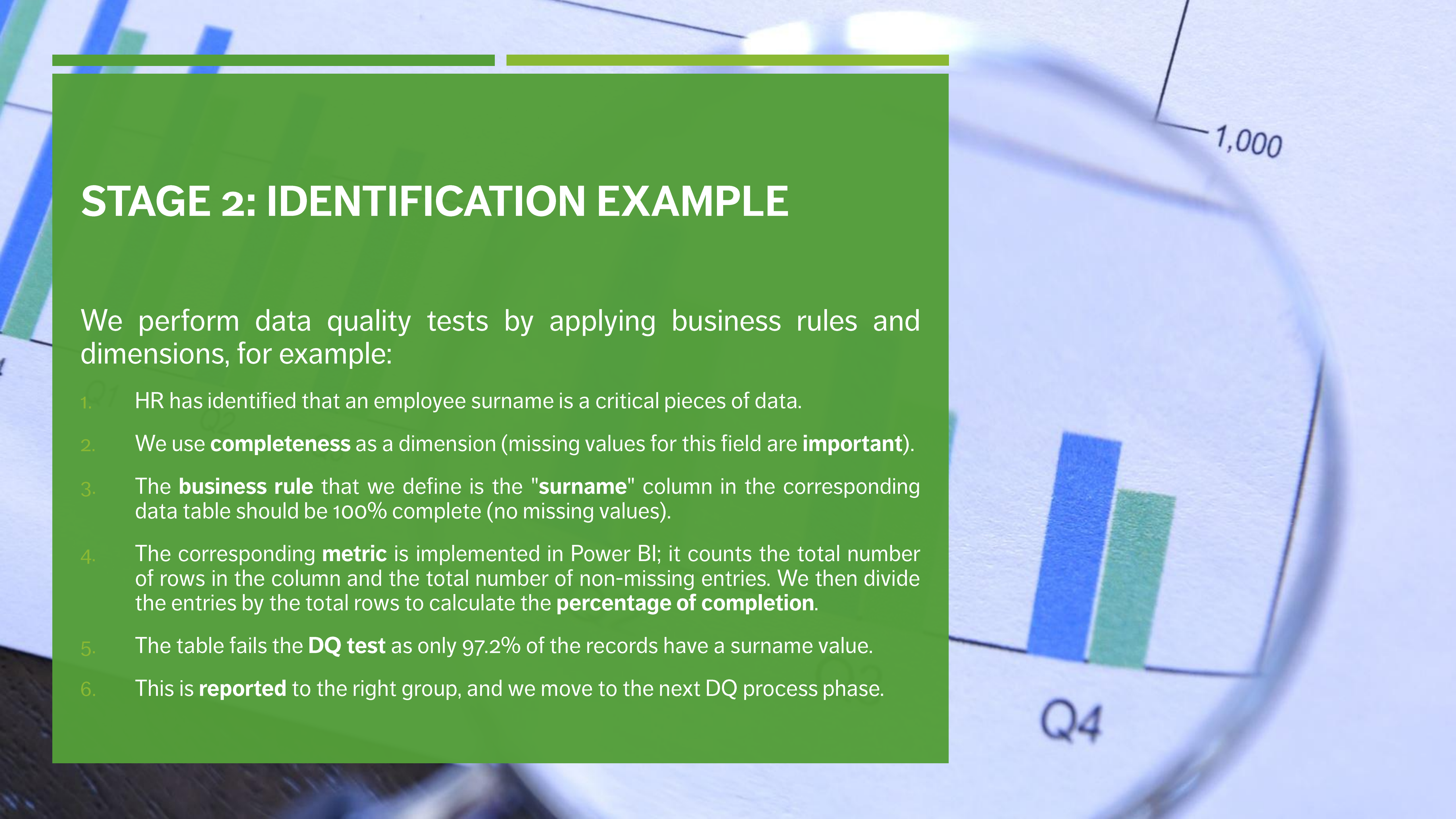
Create Business Rules

Perform and/or Improve test

Use Metrics to Monitor

Quality Assurance vs Quality Control over time





STAGE 2: IDENTIFICATION EXAMPLE

We perform data quality tests by applying business rules and dimensions, for example:

1. HR has identified that an employee surname is a critical pieces of data.
2. We use **completeness** as a dimension (missing values for this field are **important**).
3. The **business rule** that we define is the "**surname**" column in the corresponding data table should be 100% complete (no missing values).
4. The corresponding **metric** is implemented in Power BI; it counts the total number of rows in the column and the total number of non-missing entries. We then divide the entries by the total rows to calculate the **percentage of completion**.
5. The table fails the **DQ test** as only 97.2% of the records have a surname value.
6. This is **reported** to the right group, and we move to the next DQ process phase.

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