C&E data templates

Presentation & discussion

EURISCO training workshop, 12th to 14th September 2017, Gatersleben

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BACKGROUND

C&E data I

- Previously not available in EURISCO
- Of high importance to users of PGR data
  - Determine value of germplasm for breeding and research
- Difficult to handle due to lots of “standards”
  - Different descriptor names/synonyms
  - Different rating scales
    - Nominal, ordinal, metric scale
  - Different amounts of meta information
    - When, where, how, by whom?
    - Experiment set-up, treatment etc.

C&E data II

- Discussed in detail in previous years
- Suitable proposal compiled by the ECPGR Doc&Info Network in 2009
  - As simple as possible
  - As few fields as possible

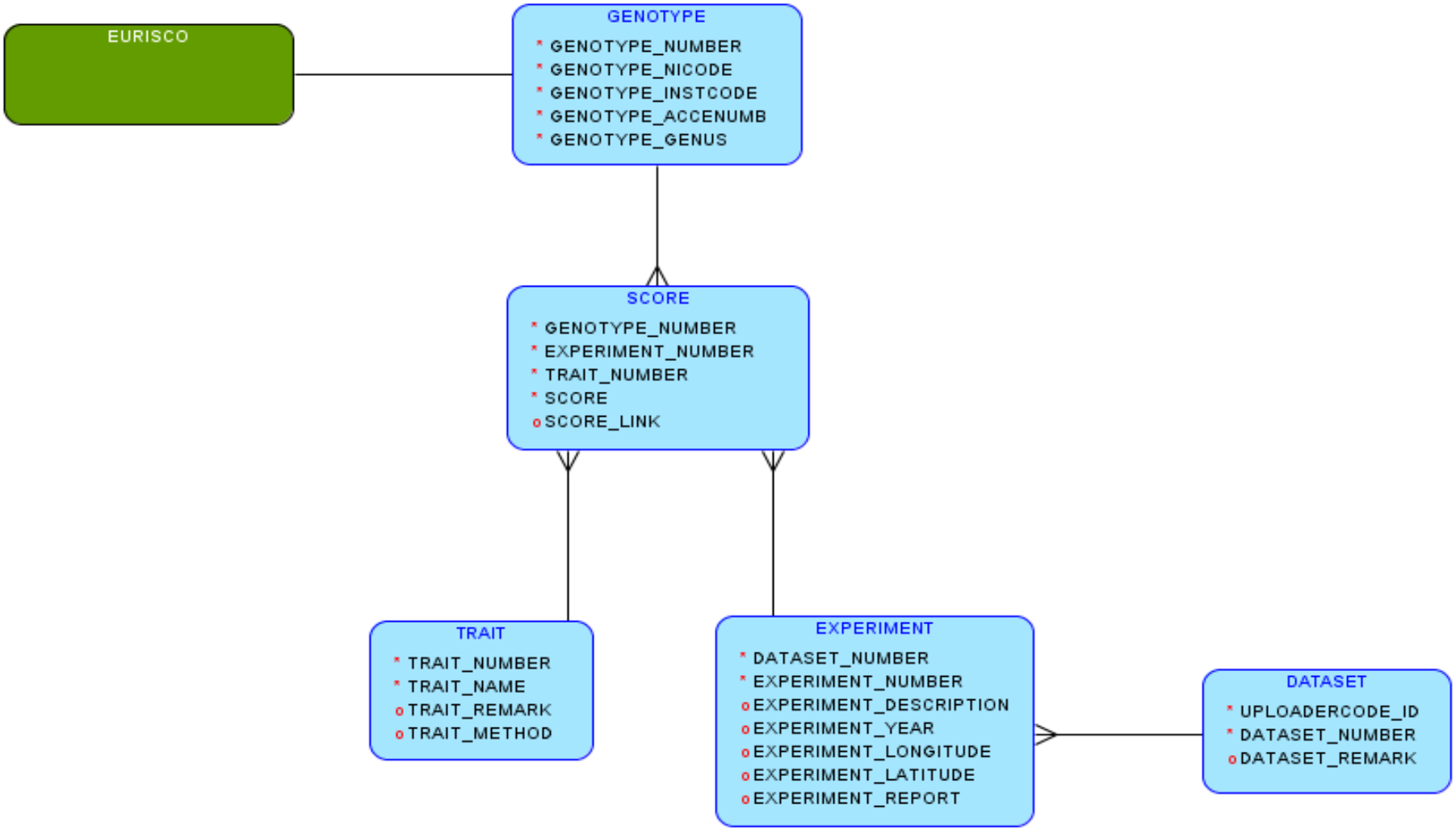
    → “minimum consensus”
- D&I meeting 2014
  - Pragmatic approach:
    - No standardisation of trait, scale or experimental design
    - Only standardisation of exchange format (as simple as possible)
    - Import of existing data as-is → reach critical mass
    - Use proposal of 2009 (+ small adjustments)

DATA MODEL

Data model for C&E data I

- Five components
  - GENOTYPE
    - Identified by EURISCO descriptors
  - DATASET
    - May comprise different experiments
  - EXPERIMENT
    - Multiple genotypes are scored for different traits
  - TRAIT
    - Characteristic feature to be scored
  - SCORE
    - Value of a trait for a genotype

Data model for C&E data II



TEMPLATES

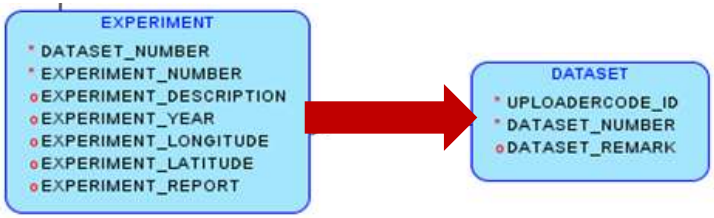
DATASET

- Enables to upload multiple experiments at once
- Fields:
  - **UPLOADERCODE***:
    - ID of registered authorised data provider
    - Provided by EURISCO
  - **DATASET_NUMBER***:
    - To link experiments with datasets
    - Unique and persistent for the data provider
  - DATASET_REMARK:
    - General remark for all scores in the dataset

UPLOADERCODE	DATASET_NUMBER	DATASET_REMARK
DEU271	1	This dataset contains forage grass accessions.
…	…	…
…	…	…

EXPERIMENT I

- Meta data helping to interpret C&E data
  - Experiment set-up
  - Weather conditions
  - Soil conditions
  - Experiment location
  - …
- Fields:
  - **DATASET_NUMBER***:
    - Reference to the dataset
  - **EXPERIMENT_NUMBER***:
    - To link scores with experiments
    - Unique and persistent for the data provider



EXPERIMENT II

- Fields (cont.):
  - EXPERIMENT_DESCRIPTION:
    - Brief English description
    - Information necessary for interpreting the scores, e.g. set-up
  - EXPERIMENT_START_YEAR:
    - Year in which the experiment was performed/started
  - EXPERIMENT_END_YEAR:
    - Year in which the experiment was ended
  - EXPERIMENT_LONGITUDE:
    - Longitude of experimental site
  - EXPERIMENT_LATITUDE:
    - Latitude of experimental site
  - EXPERIMENT_REPORT:
    - Reference to a report
      - Either report file or report URL

EXPERIMENT III

DATASET_NUMBER	EXPERIMENT_NUMBER	EXPERIMENT_DESCRIPTION	EXPERIMENT_START_YEAR	EXPERIMENT_END_YEAR	EXPERIMENT_LONGITUDE	EXPERIMENT_LATITUDE	EXPERIMENT_REPORT
1	1	Characterisation data of Lolium perenne	1999	2000	11.278414	51.826059	http://...
1	2	Characterisation data of Lolium perenne	2000		11.278414	51.826059	http://...
1	3	Characterisation data of Lolium perenne	2001		11.278414	51.826059	http://...
1	4	Evaluation data of Lolium perenne (4 replications per accession)	2002		11.278414	51.826059	http://...
…	…	…	…		…	…	…

TRAIT I

- Describe phenotypic traits and the methods used for scoring
- Fields:
  - **TRAIT_NUMBER***:
    - Unique, temporary number of the trait in the dataset
  - **TRAIT_NAME***:
    - English name of the trait
  - TRAIT_REMARK:
    - General remark helping to interpret the trait
  - TRAIT_METHOD:
    - English description of the used method + scale

TRAIT II

TRAIT_NUMBER	TRAIT_NAME	TRAIT_REMARK	TRAIT_METHOD
1	Sowing date	…	Date
2	Emerging date	…	Date
3	Growing before winter	…	Rating value from 1 (min) – 9 (max)
4	Stem height min	In flowering time, the shortest plant	Measurement [cm]
…	…	…	…

GENOTYPE I

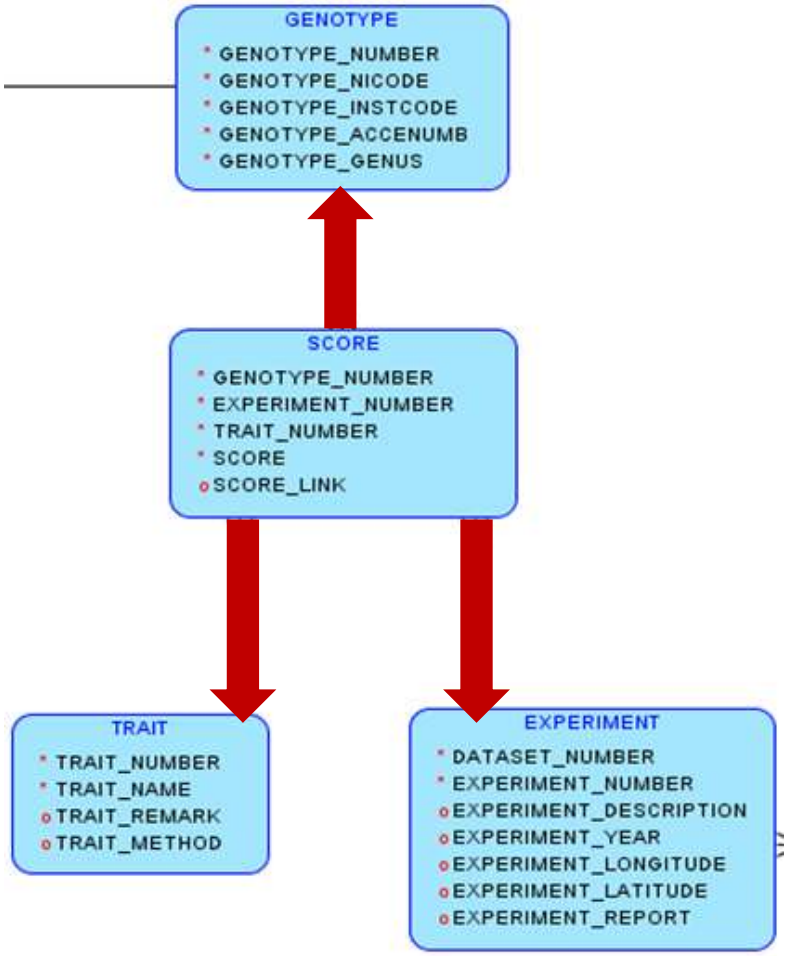
- All accessions for which C&E data will be uploaded
- Fields:
  - **GENOTYPE_NUMBER***:
    - Unique, temporary number of the genotype in the dataset
  - **GENOTYPE_NICODE***:
    - National Inventory code from EURISCO
  - **GENOTYPE_INSTCODE***:
    - Holding institute code from EURISCO
  - **GENOTYPE_ACCENUMB***:
    - Accession number from EURISCO
  - **GENOTYPE_GENUS***:
    - Genus from EURISCO
  - GENOTYPE_PUID:
    - Placeholder for a PUID

GENOTYPE II

GENOTYPE_NUMBER	GENOTYPE_NICODE	GENOTYPE_INSTCODE	GENOTYPE_ACCENUMB	GENOTYPE_GENUS	GENOTYPE_PUID
1	DEU	DEU271	GR 142	Lolium	
2	DEU	DEU271	GR 476	Lolium	
3	DEU	DEU271	GR 550	Lolium	
4	DEU	DEU271	GR 2670	Lolium	

SCORE I

- Observed phenotypic values of the accessions
- Fields:
  - **GENOTYPE_NUMBER***:
    - Reference to a genotype
  - **EXPERIMENT_NUMBER***:
    - Reference to an experiment
  - **TRAIT_NUMBER***:
    - Reference to a trait
  - **SCORE***:
    - Observed score
  - SCORE_LINK:
    - Link to a publication on accession level



SCORE II

GENOTYPE_NUMBER	EXPERIMENT_NUMBER	TRAIT_NUMBER	SCORE	SCORE_LINK
1	1	1	19990313	http://...
1	1	3	7	http://...
4	4	1	20020401	…
4	4	4	21	http://...
…	…	…	…	…
…	…	…	…	…

Putting all this together

GENOTYPE_NUMBER	GENOTYPE_NICODE	GENOTYPE_INSTCODE	GENOTYPE_ACCENUMB	GENOTYPE_GENUS	GENOTYPE_PUID
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GENOTYPE

TRAIT

TRAIT_NUMBER	TRAIT_NAME	TRAIT_REMARK	TRAIT_METHOD
1	Sowing date	…	Date
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1	1	3	7	http://…
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4	4	4	21	http://…
…	…	…	…	…
…	…	…	…	…

SCORE

DATASET_NUMBER	EXPERIMENT_NUMBER	EXPERIMENT_DESCRIPTION	EXPERIMENT_START_YEAR	EXPERIMENT_END_YEAR	EXPERIMENT_LONGITUDE	EXPERIMENT_LATITUDE	EXPERIMENT_REPORT
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…	…	…	…		…	…	…

EXPERIMENT

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DEU271	1	This dataset contains forage grass accessions.
…	…	…
…	…	…

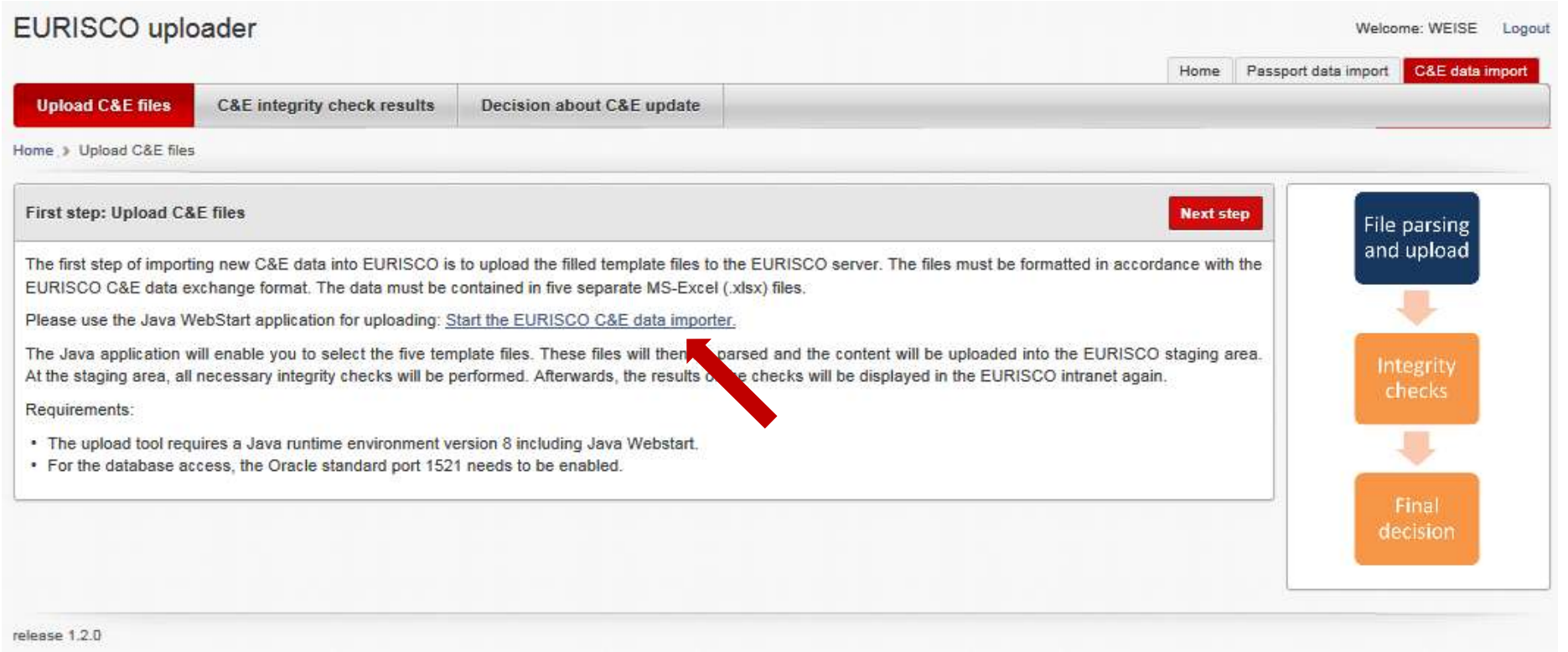
DATASET

PROCEEDING

Proceeding for data upload

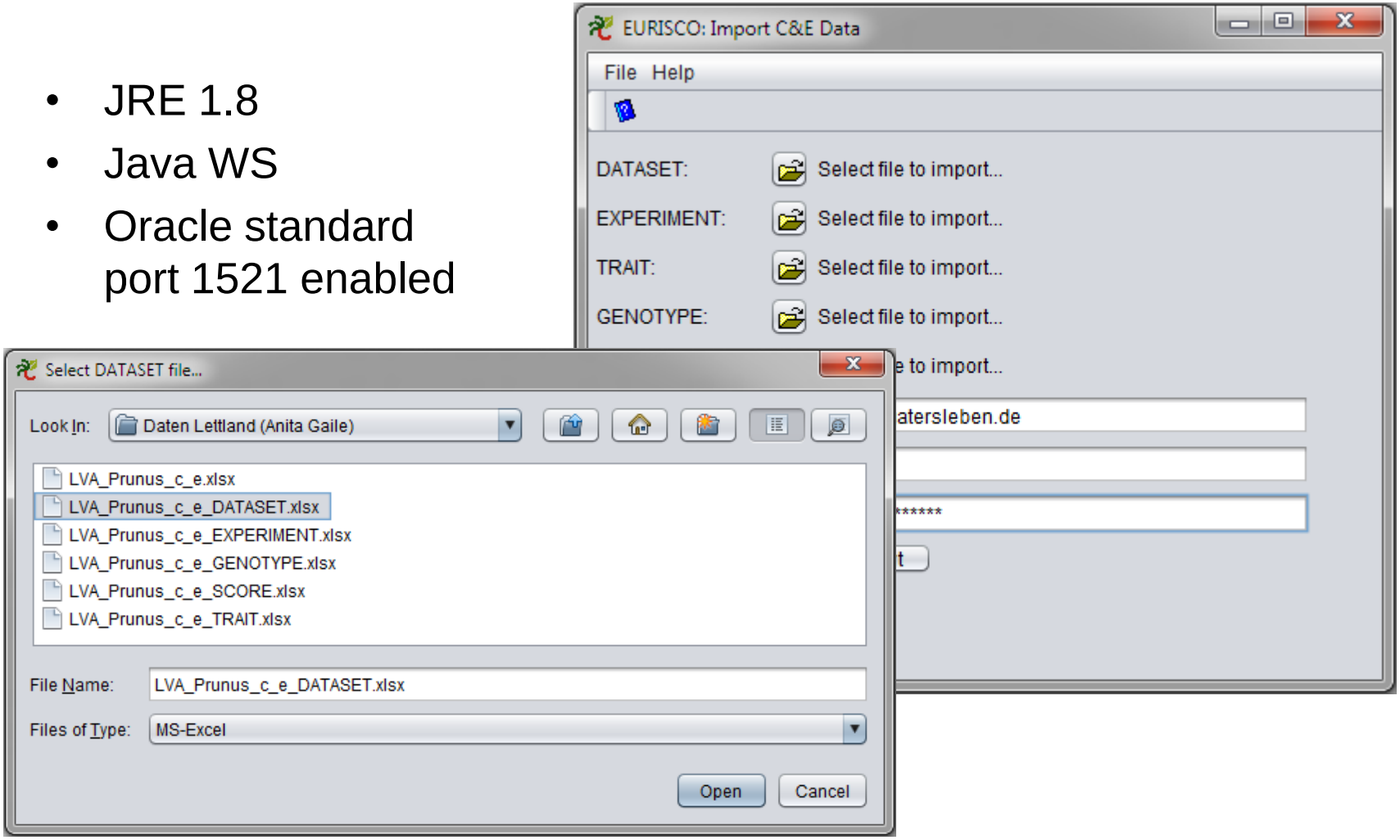
- Prerequisite:
  - Only non-confidential C&E data
  - Only data of accessions listed in EURISCO
- Impact
  - NFPs responsible for data upload (Data Sharing Agreements)
    - →May nominate users for (sub) accounts for data uploads
    - →NFPs must approve data before publication
- Data formatting
  - According to exchange format in MS Excel (.xlsx) files
- Upload via EURISCO intranet

Upload of C&E data files I

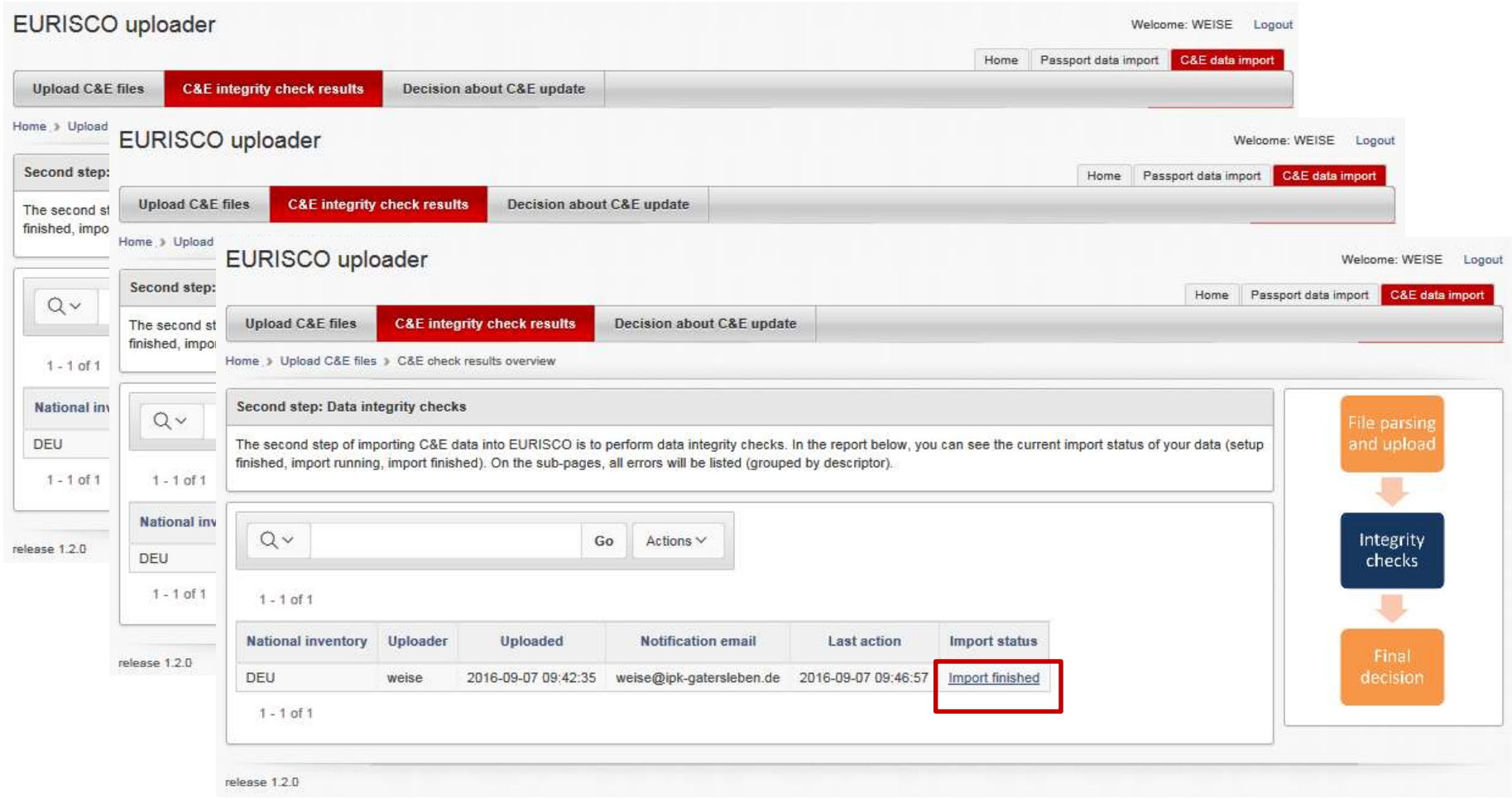


Upload of C&E data files II

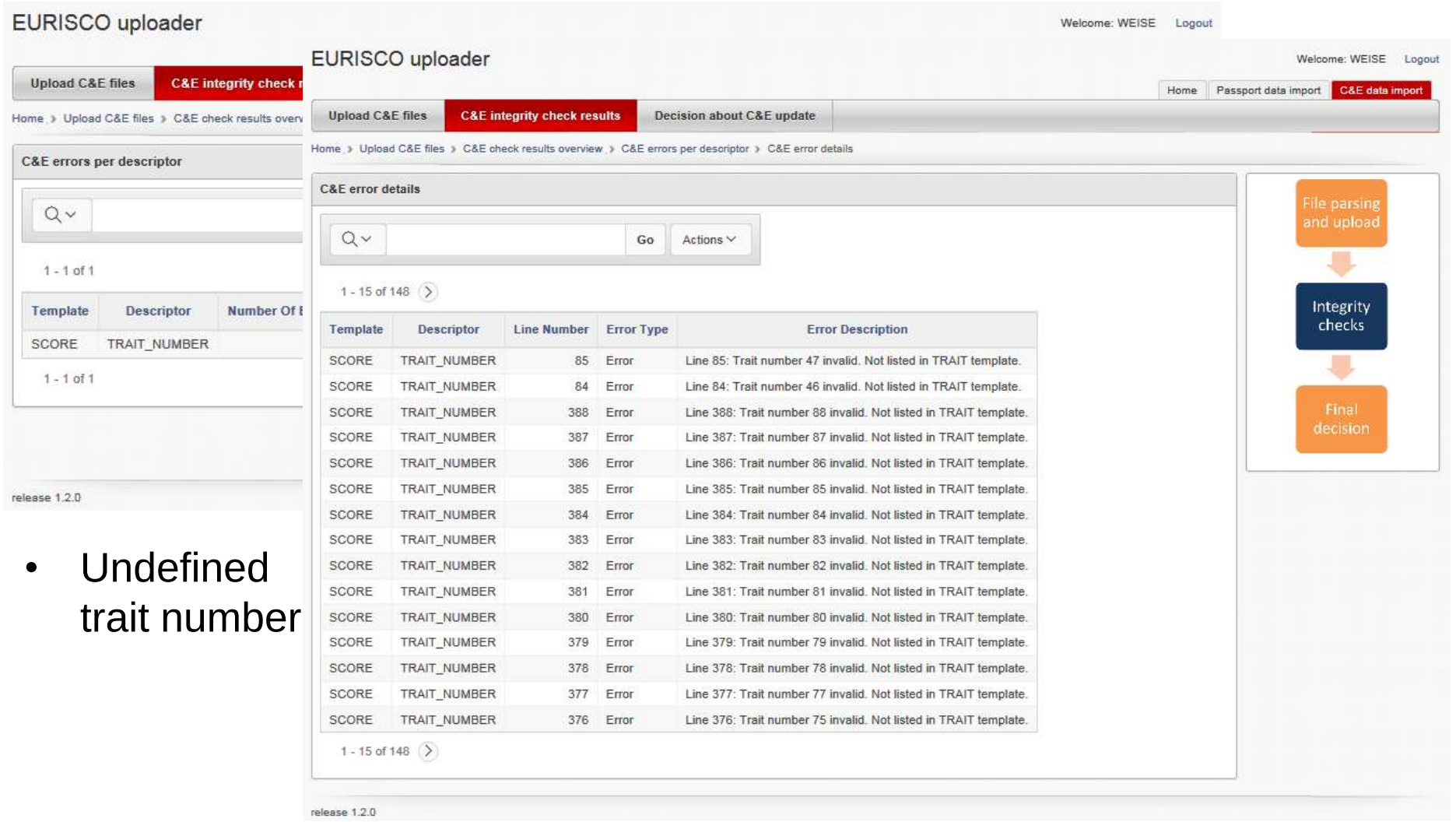
- JRE 1.8
- Java WS
- Oracle standard port 1521 enabled



Integrity checks I

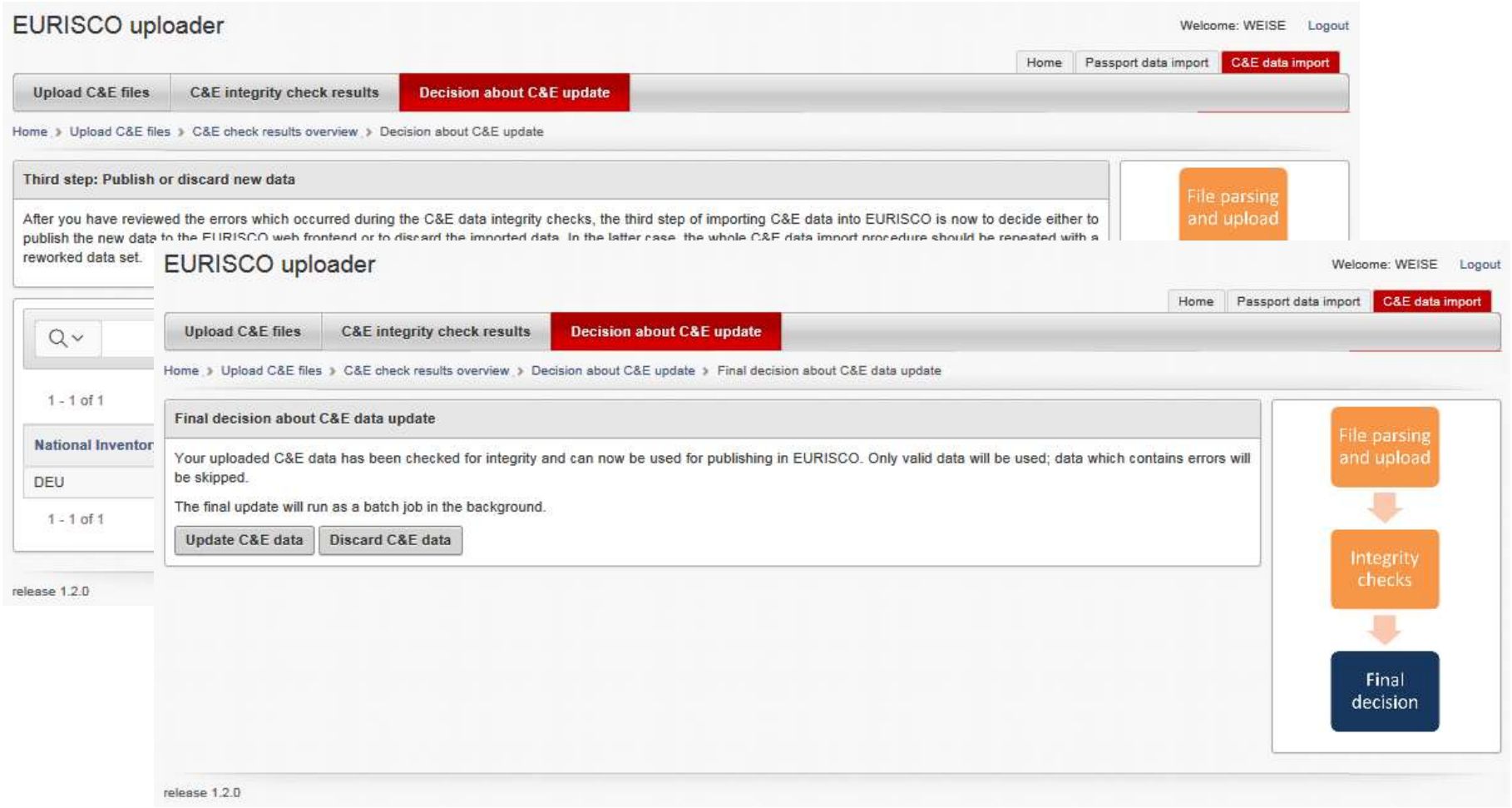


Integrity checks II



- Undefined trait number

Final decision



Next steps (in background)

- New dataset will be applied to EURISCO stage schema
  - Existing C&E data will not be overwritten
  - Existing C&E data may be removed on request

- EURISCO stage will be synchronised to the EURISCO web schema (Time lag!)
  - Not in main business hours
  - Rebuild of materialised views
  - News message on EURISCO webpage