IC^E

Development and maintenance of the ICE-key system

Presentation on 08.05.2008

Proper Principles for the ICE key

- **Uniqueness:** two different data never have the same code
- **Consistency**: a key has to describe always the same fact
- Every key has characteristics and attributes with a number and a label

For example: characteristic „gender“ (no. 502) with the attributes „total“ (no. 0)
„male“ (no. 1)
„female“ (no. 2)

- The attributes in every characteristic have to describe all possible cases in a data stock

For example: A data stock contained the characteristic „*nationality*“ with the attributes „*Sri Lankan*“, „*German*“….
But there are some people without nationality or with unknown nationality, so the characteristic nationality needs the attributes „*without*“ and „*unknown*“

Different ICE-keys

In every data stock you find:

1. Three **keys of administration**: source, notation, data quality

   Every stock has these three keys, each with only one attribute.

2. A key to **describe the „topic“** of the stock (in the ICE-system keys 101 – 109)

   Because of this key, the system „knows“ the topic of the Catalogue. In every stock, there is only one characteristic of „topic“ with one or more attributes.
   For example: → characteristic „study demand“ with the attributes „enrolled students“, „graduated students“, …
   → characteristic „staff at institutions of higher education“ with the attributes „scientific staff“, „administrative staff“, …

3. The key **time point** – without a time point data would be senseless

4. **Further characteristics** that describe the stock (gender, universities…)

   Which further characteristics you find in in a data stock, depends on the content of the data.

Example for the encoding of a data stock

1. **Keys of Administration**:
   source: Federal Statistical Office Germany
   data quality: Final
   Notation: Number

2. **Key of topic**:
   Enrolled Students

3. **Time point**: years

students on type of institution in Germany

year	students		
	total	therefrom on	
		universities	Colleges of art and music
Germans and foreigners			
2003	2019465	1436679	31211
2004	1963108	1372531	30960
2005	1985765	1386784	31593
Germans			
2003	1773329	1251676	23053
2004	1716774	1188736	22743
2005	1737408	1203346	23212

4. **Further characteristics**:

Place of report

Type of institutions of higher education

Nationality

Example for the encoding of a data stock

	Characteristic		Attribute	
	Label	**Number**	**Label**	**Number**
source	Federal Statistical Office Germany	702	Main Report	21
data quality	Data quality	701	Final	2
Notation	Notation	201	Number	1
Key of topic	Study demand	101	Enrolled students	4
time point	Year	605	2003	20030
			2004	20040
			2005	20050
Place of reoprt	Germany	403	Total	0
Type of institutions of higher education	Type of institution	504	Total	0
			Universities	11
			Colleges of art and music	20
Nationality	Nationality	502	Total	0
			Germans	1

Example for the encoding of a data stock

The encoding table:

encoding the rows

characteristic	study demand	Germnay	Nationality	year
	101	403	502	605
attributes	4	0	0	20030
	4	0	0	20040
	4	0	0	20050
	4	0	1	20030
	4	0	1	20040
	4	0	1	20050

encoding of the columns

characteristic: type of institution - **504**

0	11	20
students on type of insitituions in Germany		
students		
total	therefrom on	
	universities	colleges of art and music
Germans and foreigners		
2019465	1436679	31211
1963108	1372531	30960
1985765	1386784	31593
Germans		
1773329	1251676	23053
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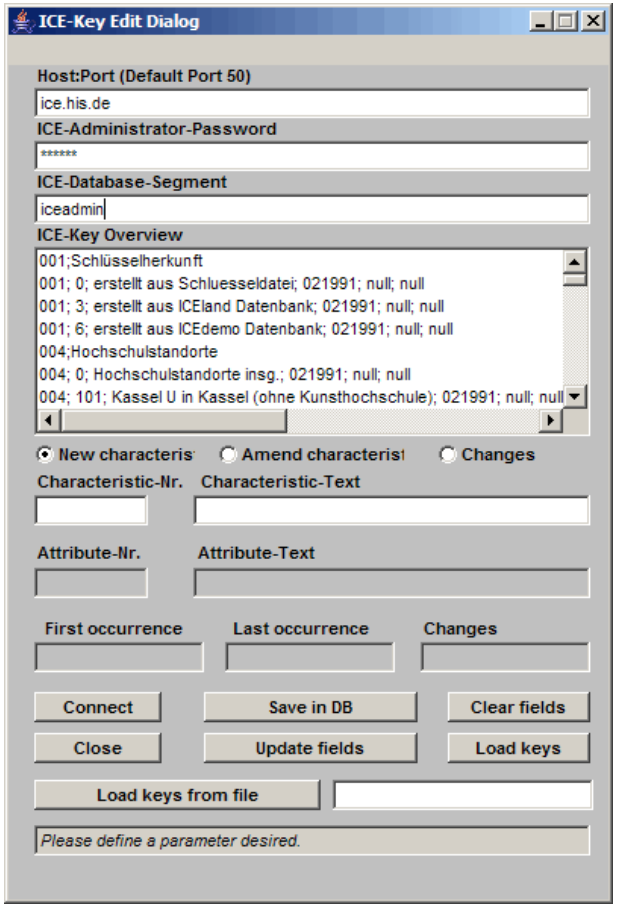
Database maintenance

- „**ICE-Key** Edit Dialog“ insert and edit keys
- Import **Implications** and **Equivalencies** with java classes
- „Modifying **Keywords“** – maintenance and edit Keywords and insert with a java class
- Insert Definitions with SQL-commands

All manipulations can also be done with data base front-end like phpMyAdmin or with SQL-commands, but the ICE tools offer some benefits.

ICE-Key Edit Dialog



Start the java class „ICE-Key Edit Dialog“ in a console and connect it with the data base

Options:

→ **Editing single characteristics** and attributes

- Inserting new characteristics
- Adding new attributes to an existing characteristic
- Changing texts of existing characteristics and attributes

→ **Editing extensive changes** of characteristics and/or attributes using a read file

Benefits:

- The tool executes all necessary entries in the meta tables
- Extensive entries are done in one step
- Use the read file for the maintenance of different data bases

ICE-Key Edit Dialog

Important is the maintenance of the **read file**

Format:
3 tab stops (→) to the characteristics
5 tab stops (→) to the attributes
1 tab stop (→) between no. and label

```
→  →  →  501 →      Gender
→  →  →  →   →  0→  Total
→  →  →  →   →  1→  Male
→  →  →  →   →  2→  Female
→  →  →  →   →  9→  Not stated
→  →  →  502 →      Nationality (dich.)
→  →  →  →   →  00→ Germ. and foreign. total
→  →  →  →   →  01→ Germans
→  →  →  →   →  02→ Foreigners
→  →  →  →   →  99→ Unknown
```

Delete keys

Attributes and characteristics may be deleted **only directly in the database**.

Characteristics may be deleted in the meta ‘tabellenmerkmale’ (table characteristics)
Attributes may be deleted in the meta ‘tabellenschluessel’ (table key)

You can only delete keys when all references in other meta tables and data tables have been deleted before!

Implications

Implications are used by the sort function.

They represent unique hierarchical relations between keys.

subject group A
subject 1
subject 2
subject group B
subject 3
subject 4

you can read

characteristic 309 - attribute 1
includes characteristic 303 - attribute 1
characteristic 303 - attribute 2
characteristic 309 - attribute 2
includes characteristic 303 - attribute 3
characteristic 303 - attribute 4

Implications

Implications are organised in the data base in the **merkimp meta table**.

merkmal1	auspr1	merkmal2	auspr2
303	1	309	1
303	2	309	1
303	3	309	2
303	3	309	2

Use the **java class „ImplGenerator“** for inserting the Implications that are provided in the read file „merkimpl“.

Example **read file “merkimpl”:**
First enter the characteristic no. and the attribute no. of the inferior key, and then the characteristic no. and attribute no. of the superior key, separated by #

```
303#1#309#1
303#2#309#1
303#3#309#2
303#4#309#2
```

Equivalences

Equivalences describe the same facts as regard contents.

For example two characteristics for types of institutions, one more and one less differentiated

504 Type of Institution (detailed)

00	Institutions of higher education (total)
01	Uni. (incl. CoE, CU, CT, CA)
10	Uni. (excl. CA)
11	Uni. (excl. CoE, CU, CT, CA)
12	Col. of education (HS)
13	Col. of theology (HS)
20	Col. of art and music
30	Comprehensive universities
40	Fachhochsch. (total)
41	FH excl. coll. of public administr.
42	Coll. of public administr.
50	Other colleges
60	Colleges abroad
70	Medical facilities
80	Other than EDU facilities

503 Type of Institution (dich)

00	Institutions of higher education (total)
01	Universities
03	Fachhochsch. (total)
04	Other colleges

The Equivalences „tell“ the system: characteristic 504-1 is equal to characteristic 503-1.

Equivalences

Equivalences are organised in the data base in the **merkequ meta table**.

merkmal1	auspr1	merkmal2	auspr2
504	00	503	0
504	01	503	1
504	40	503	3
504	50	503	4

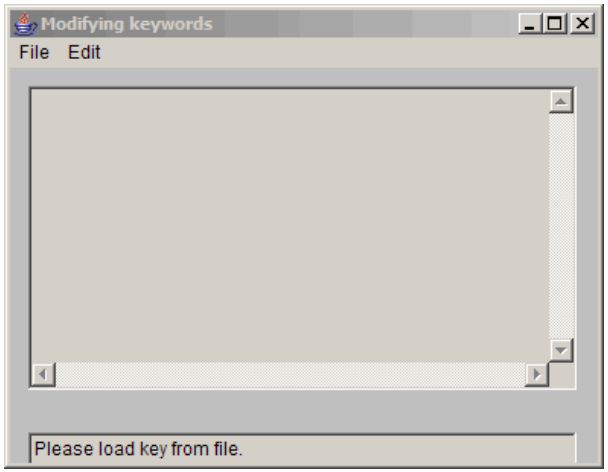
Use the java class **„MerkEquivalentGenerator**“ and insert the Equivalences with the read file „merkequ“.

read file **merkmequ**

(␣ = blank)

```
␣504␣503␣␣00␣␣␣0
␣504␣503␣␣01␣␣␣1
␣504␣503␣␣40␣␣␣3
␣504␣503␣␣50␣␣␣4
```

Modifying Keywords



Generate the read file “Schlagworte” (keywords) with the **„Modifying Keyword“** tool.

Insert the Keywords into the data base with the **java class KeywordGenerator**.

The tool needs the file **GedaechtnisCode** (MemoryCode)

… and automatically generate the **read file „Schlagworte“ (keywords).**

Example MemoryCode:

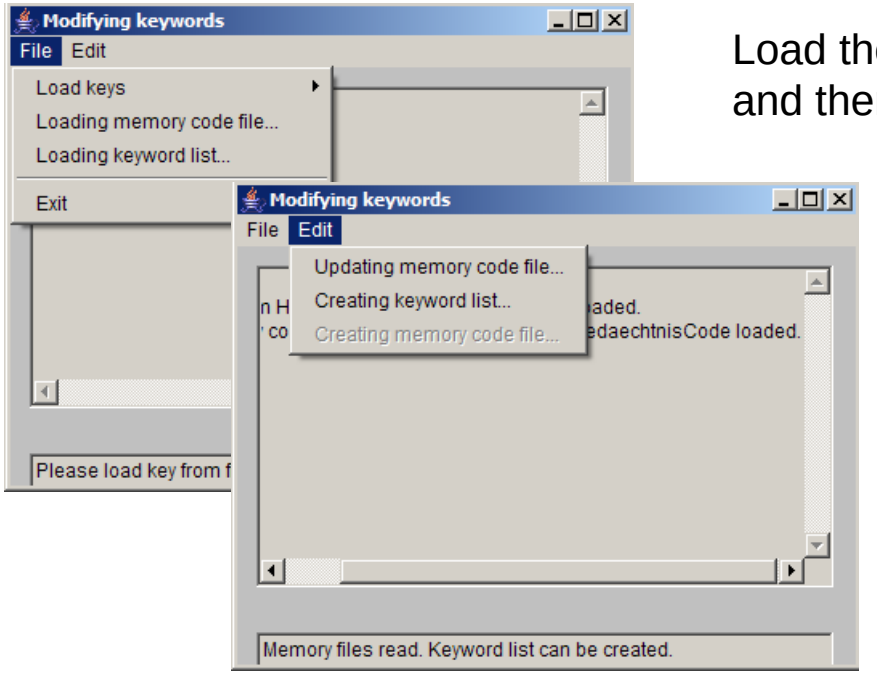
```
␣102␣␣␣-1#Schoolsystem#Schoolsystem
␣101␣00006#Graduates#Graduates#Examinations
```

Example read file

```
␣101␣00006,Examinations
␣101␣00006,Graduates
␣106␣00035,Graduates
␣142␣␣␣␣-1,Expenditures/revenues
```

␣ =blank

Modifying Keywords



Load the key from the data base,
and then the file GedaechtnisCode

Generate the read file.

Keywords are on two data bases: *ice* database and *sta* database

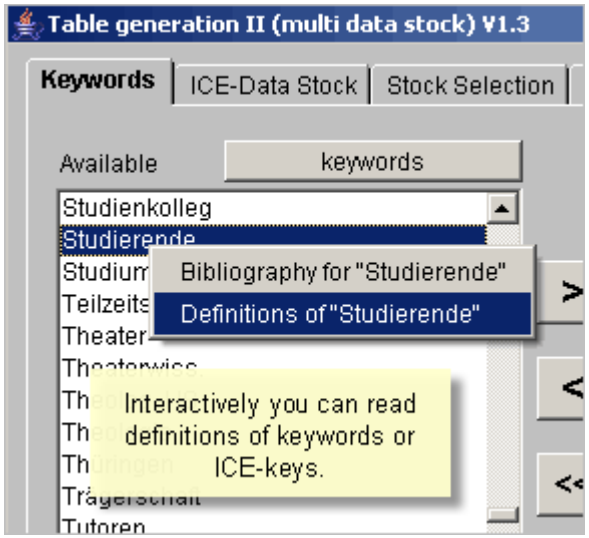
Use the different java classes **„KeywordGenerator“** and **„StandardSWupddate“** to insert the Keywords

Definitions

In the old Table Generations (Type I and II) you can open definitions on the tab Keyword or ICE-Key. It will be opened as html file in a browser.

The following information are organized in meta tables

- definition term
- definition text
- defintion no.
- definition source
- synomyms



A Definition text can only be found by the system if the keyword exactly matches the definition term or one of the related synonyms.

You can read definitions with SQL-commands or with the data bas front-end.

Definitions

You create several definitions texts for one definition terms and you can attach one definitiontext to different keywords or keys

Definition text A found by Term 1 + Synonym x, Synonym y
Definition text B found by Term 2 + Synonym x
Definition text C found by Term 3

Term 1 → Definition text A and Definition text B
Term 2 → Definition text B and Definition text A
Term 3 → Definition text C
Synonym x → Definition text A and Definition text B
Synonym y → Definition text A