

Overview of the ICE Database Structure

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1 Definition of Keys

A key in the ICE System consists of a three digit number for the characteristics and up to five digit numbers for the attributes of the characteristics. A characteristic is the superordinate concept for a set of attributes. For example the characteristic "gender" contains the attributes "male" and "female". The characteristic gender together with the attribute female forms a key.

1.1 tabellenmerkmale

mschluessel	merkmal
1	Schlüsselhe...
4	Hochschulst...
21	Hochschulst...
...	...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
mschluessel	NOT NULL	int(3)	PK
merkmal		varchar(150)	

primary keys:
mschluessel

This table defines all characteristics (mschluessel) and their labels (merkmal).

1.2 tabellenschluessel

mschluessel	aschluessel	erstesvorkommen	...
1	0	021991	...
1	3	021991	...
1	6	021991	...
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
mschluessel	NOT NULL	int(3)	PK/FK
aschluessel	NOT NULL	int(5)	PK
erstesvorkommen		varchar(6)	
aenderung		varchar(6)	
letztesvorkommen		varchar(6)	
auspraegung		varchar(150)	

primary keys:
mschluessel, aschluessel

foreign keys:

mschluessel from tabellenmerkmale (mschluessel)

This table defines all attributes (aschluessel) and their labels (auspraegung). It references the characteristic (mschluessel) for every attribute in the table tabellenmerkmale.

2 Definition of Keywords

Keywords are used in the ICE to search for stocks. They describe the characteristics and attributes a stock should contain i.e. the topic the user searches data for. One keyword can be linked to several characteristics or attributes.

2.1 schlagworte

schlagwort	kennzahl
1st academi...	0
1st degree ...	1
1960	2
...	...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
schlagwort		varchar(150)	
kennzahl	NOT NULL	int(4)	PK

primary keys:

kennzahl

The keywords (German "Schlagworte") are defined in the table schlagworte. It contains the labels (schlagwort) and an id (kennzahl).

2.2 merkschlagworte

kennzahl	mschluessel
325	101
320	102
357	102
...	...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
kennzahl	NOT NULL	int(4)	PK/FK
mschluessel	NOT NULL	int(3)	PK/FK

primary keys:

kennzahl, mschluessel

foreign keys:

mschluessel from tabellenmerkmale (mschluessel)

kennzahl from schlagworte (kennzahl)

This table links keywords to characteristics. The field kennzahl contains the id of the keyword as defined in the table schlagwort. The field mschluessel (characteristic) references a characteristic in the table tabellenmerkmale.

2.3 ausprschlagworte

kennzahl	mschluessel	aschluessel
418	101	1
415	101	2
474	101	2
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
kennzahl	NOT NULL	int(4)	PK/FK
mschluessel	NOT NULL	int(3)	PK/FK
aschluessel	NOT NULL	int(5)	PK

primary keys:

kennzahl, mschluessel, aschluessel

foreign keys:

mschluessel, aschluessel from tabellenschluessel (mschluessel, aschluessel)

kennzahl from schlagworte (kennzahl)

This table links keywords to attributes. The field kennzahl contains the id of the keyword as defined in the table schlagworte. The fields mschluessel (characteristic) and aschluessel (attribute) reference a key in the table tabellenschluessel.

3 Definition of Virtual Stocks

Virtual stocks define the metadata (keys, points in time etc.) for a collection of data tables. They have numerical IDs with three digits. Virtual stocks can be searched and selected by the user through the keyword search.

3.1 virtuellebestaende

bestandnr	bereich	zeitmerkmal	...
101	1	605	...
102	2	605	...
104	4	605	...
...

Name	Null?	Type	Key?
bestandnr	NOT NULL	int(5)	PK
bereich	NOT NULL	int(1)	FK
zeitmerkmal	NOT NULL	int(3)	FK
jahrstart	NOT NULL	int(1)	
bezeichnung		varchar(50)	
bestandsart	NOT NULL	int(1)	FK

primary keys:

bestandnr

foreign keys:

bestandsart from virtbestarten (id)

zeitmerkmal, jahrstart from zeitmerkmale (zeitmerkmal, jahrstart)

bereich from bereiche (id)

This table describes all virtual stocks, the ID (bestandnr), the topic area (bereich) the time characteristic (zeitmerkmal), the type of stock (aggregated or single case data - bestandsart) and the label (bezeichnung).

There exist to distinct types of virtual stocks in the system:

Aggregated data stocks contain data that is already aggregated, meaning it contains sums of all characteristics.

Individual case data stocks contain data that consists of single cases and is not aggregated.

3.2 virtbestschluessel

bestandnr	merkmal	auspraegung	verwaltung
101	101	2	0
101	101	3	0
101	101	4	0
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
bestandnr	NOT NULL	int(5)	PK/FK
merkmal	NOT NULL	int(3)	PK/FK
auspraegung	NOT NULL	int(5)	PK
verwaltung	NOT NULL	int(1)	FK

primary keys:

bestandnr, merkmal, auspraegung

foreign keys:

merkmal, auspraegung from tabellenschluessel (mschluessel, aschluessel)

bestandnr from virtuellebestaende (bestandnr)

verwaltung from verwaltungsmerkmale (id)

This table lists all the keys contained in the virtual stocks. The stock id (bestandnr) references the virtual stock in table virtuellebestaende. Characteristic (merkmal) and attribute (auspraegung) reference the keys in table tabellenschluessel.

3.3 virteinzelfbestand

bestandnr	tabnr	merkmal	auspraegung
301	10110000	604	20021
301	10110001	604	20022
301	10110002	604	20031
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
bestandnr	NOT NULL	int(5)	PK
tabnr	NOT NULL	int(8)	PK
merkmal	NOT NULL	int(3)	
auspraegung	NOT NULL	int(5)	

primary keys:

bestandnr, tabnr

This table contains a list of all physical tables (tabnr) and the points in time they represent (merkmal, auspraegung) for every individual case data stock. *Note that such a direct connection between virtual stocks and physical data tables is not available for aggregated data stocks.*

4 Physical Stock Tables (Data Tables)

4.1 spaltenmerkmale

merkmal	tabnr
501	10110000
501	10110001
501	10110002
...	...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
merkmal	NOT NULL	int(3)	PK/FK
tabnr	NOT NULL	int(8)	PK/FK

primary keys:

merkmal, tabnr

foreign keys:

tabnr from datenbestand (tabnr)

merkmal from tabellenmerkmale (mschluessel)

This table defines for every physical aggregate data table (tables beginning with "datentab_") which column characteristic it has.

The column characteristic is the characteristic for the fields $a_{n1}..a_{nn}$ where the different n in the a_n are attributes of the characteristic and the column contents are the sums for each characteristic.

4.2 datentab_10110000

m101	m403	m605	...
2	0	19930	...
2	0	19930	...
2	0	19930	...
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
m101	NOT NULL	mediumint(5)	PK
m403	NOT NULL	mediumint(5)	PK
m605	NOT NULL	mediumint(5)	PK
m504	NOT NULL	mediumint(5)	PK
m506	NOT NULL	mediumint(5)	PK
m305	NOT NULL	mediumint(5)	PK
m301	NOT NULL	mediumint(5)	PK
m502	NOT NULL	mediumint(5)	PK
a0		decimal(15)	
a1		decimal(15)	
a2		decimal(15)	

primary keys:

m101, m403, m605, m504, m506, m305, m301, m502

4.3 edatentab_10110000

id	m403	m604	...
1	19	20021	...
2	19	20021	...
3	19	20021	...
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
id	NOT NULL	int(11)	PK
m403	NOT NULL	int(2)	
m604	NOT NULL	int(5)	
m504	NOT NULL	int(2)	
m004	NOT NULL	int(5)	
m511	NOT NULL	int(1)	
m506	NOT NULL	int(1)	
m501	NOT NULL	int(1)	
m523	NOT NULL	int(2)	
m410	NOT NULL	int(3)	
m110	NOT NULL	int(1)	
m610	NOT NULL	int(5)	
m418	NOT NULL	int(3)	
m615	NOT NULL	int(2)	
m419	NOT NULL	int(3)	
m616	NOT NULL	int(2)	
m361	NOT NULL	int(2)	
m363	NOT NULL	int(1)	
m362	NOT NULL	int(2)	
m117	NOT NULL	int(4)	
m116	NOT NULL	int(2)	
m414	NOT NULL	int(2)	
m422	NOT NULL	int(1)	
m423	NOT NULL	int(3)	
m373	NOT NULL	int(1)	
m101	NOT NULL	int(2)	
m371	NOT NULL	int(1)	
m351	NOT NULL	int(2)	
m353	NOT NULL	int(1)	
m352	NOT NULL	int(2)	
m372	NOT NULL	int(1)	
m309	NOT NULL	int(2)	
m312	NOT NULL	int(2)	
m314	NOT NULL	int(3)	
m425	NOT NULL	int(4)	
m051	NOT NULL	int(1)	
m405	NOT NULL	int(5)	
m550	NOT NULL	int(1)	
m502	NOT NULL	int(2)	
m111	NOT NULL	int(2)	
m112	NOT NULL	int(2)	
m052	NOT NULL	int(1)	

primary keys:

id

4.4 tabverwaltung1

tabnr	merkmal	ausprmin	...
10110000	101	2	...
10110000	301	0	...
10110000	305	0	...
...

Name	Null?	Type	Key?
tabnr	NOT NULL	int(8)	PK/FK
merkmal	NOT NULL	int(3)	PK/FK
ausprmin		int(5)	
ausprmax		int(5)	
sonderfaelle		int(1)	
datenbestandsart		int(1)	

primary keys:

tabnr, merkmal

foreign keys:

tabnr from datenbestand (tabnr)

merkmal, ausprmin from tabellenschluessel (mschluessel, aschluessel)

merkmal, ausprmax from tabellenschluessel (mschluessel, aschluessel)

The tables *tabverwaltung_n* where n is a number from 1 to 6 define which keys exist in the physical aggregate data stocks. Every n is for a certain topic area like students, university staff etc. The table number (tabnr, which is identical with the numbers in the physical stock tables) references the table number in the table datenbestand. Characteristic (merkmal) and the minimum and maximum attributes (ausprmin, ausprmax) reference the keys in table tabellenschluessel. Every table contains the attributes from ausprmin to ausprmax from the characteristic. The count of missing attributes (sonderfaelle) shows how many attributes are missing between ausprmin and ausprmax in the stock (for these see also below: table sonderfehl1).

4.5 sonderfehl1

tabnr	merkmal	ausprfehl
10111000	101	3
10111000	101	5
10110024	305	1
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
tabnr	NOT NULL	int(8)	PK/FK
merkmal	NOT NULL	int(3)	PK/FK
ausprfehl	NOT NULL	int(5)	PK

primary keys:

tabnr, merkmal, ausprfehl

foreign keys:

tabnr from datenbestand (tabnr)

merkmal, ausprfehl from tabellenschluessel (mschluessel, aschluessel)

4.6 datenbestand

tabnr	tabname	aufgabengebiet	...
10110000	Thema: Lehr...	10	...
10110001	Thema: Lehr...	10	...
10110002	Thema: Lehr...	10	...
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
tabnr	NOT NULL	int(8)	PK/FK
tabname		text(65535)	
aufgabengebiet		int(2)	
bereich		int(2)	
mdataenquelle		int(3)	FK
adataenquelle		int(5)	
mdarstellungsart		int(3)	FK
adarstellungsart		int(5)	
mdataenqualitaet		int(3)	FK
adataenqualitaet		int(5)	
nachkommastellen		int(1)	
bestandsart	NOT NULL	int(1)	PK

primary keys:

tabnr, bestandsart

foreign keys:

mdataenquelle, adatenquelle from tabellenschluessel (mschluessel, aschluessel)

mdarstellungsart, adarstellungsart from tabellenschluessel (mschluessel, aschluessel)

mdataenqualitaet, adatenqualitaet from tabellenschluessel (mschluessel, aschluessel)

tabnr, bestandsart from icetabellen (tabnr, bestandsart)

This table contains information about all physical aggregate data tables in the system. It contains the table number (tabnr), a textual description of the table (tabname), the topic area (bereich) and the administrative characteristics of the tables: data source (mdatenquelle, adatenquelle), data measure (mdarstellungsart, adarstellungsart) and data quality (mdatenqualitaet, adatenqualitaet). Furthermore it says how many decimal places the data contains (nachkommastellen).

5 Definition of Implications and Equivalences

In the ICE system implication means a hierarchical relationship between two characteristics. This means that attributes of one characteristic can be expressed as sums over groups of attributes of another characteristic.

Equivalences mean that two keys have the same semantical meaning.

5.1 merkimp

merkmal1	auspr1	merkmal2	auspr2
314	0	303	0
314	1	303	1
314	690	303	1
...

Name	Null?	Type	Key?
merkmal1	NOT NULL	int(3)	PK/FK
auspr1	NOT NULL	int(5)	PK
merkmal2	NOT NULL	int(3)	PK/FK
auspr2	NOT NULL	int(5)	PK

primary keys:

merkmal1, auspr1, merkmal2, auspr2

foreign keys:

merkmal1, auspr1 from tabellenschluessel (mschluessel, aschluessel)

merkmal2, auspr2 from tabellenschluessel (mschluessel, aschluessel)

This table defines hierarchical relationships between keys. These relationships are used to sort the attributes of one characteristic by attributes of another characteristic that stands higher in the hierarchy. The keys that constitute the sums are merkmal1 (characteristic) and auspr1 (attribute), whereas the sum key is merkmal2, auspr2.

5.2 merkequ

merkmal1	auspr1	merkmal2	auspr2
404	101	4	101
404	102	4	102
404	103	4	103
...

<i>Name</i>	<i>Null?</i>	<i>Type</i>	<i>Key?</i>
merkmal1	NOT NULL	int(3)	PK/FK
auspr1	NOT NULL	int(5)	PK
merkmal2	NOT NULL	int(3)	PK/FK
auspr2	NOT NULL	int(5)	PK

primary keys:

merkmal1, auspr1, merkmal2, auspr2

foreign keys:

merkmal1, auspr1 from tabellenschluessel (mschluessel, aschluessel)

merkmal2, auspr2 from tabellenschluessel (mschluessel, aschluessel)

This table contains equivalences between keys. The keys characteristic1 (merkmal1), attribute1 (auspr1) and characteristic2 (merkmal2), attribute2 (auspr2) are semantically equivalent to each other, meaning they can substitute each other in table definitions without changing the meaning of the definition.