

# *IEA Coding Software*

## *Coding Expert*



Presentation prepared for the  
IEA General Assembly in Hong Kong  
October 2007

# *Content*

1. Coding
2. Modes of Coding
3. Why a new coding software?
4. Who was involved?
5. Process of Computer Aided Coding
6. Modular software concept
7. The Coding Expert Manager
8. The Coding Expert Client
9. The Coding Expert Trainer
10. Next steps

# 1. Coding

- Also known as scoring, marking, or rating
- Assign a code, i.e. a number to a constructed response item
  - Simple answer (word or figure; 0,1)
  - More detailed response (partial credit; more options; e.g. 0,1,2...)
  - Essay (Many dimensions)
- Requirements:
  - Coding instructions
  - Training guidelines with examples
  - Logistics procedures
  - Control procedures

## *2. Modes of coding*

- Paper and pencil
  - Implemented in many IEA studies
  - Many copies
  - Training procedures
  - Logistics and control
- Computer Aided Coding (Implemented at the DPC for national projects since 5 years)
  - Scanned material
  - Software for
    - Coding
    - Training
    - Logistics
    - Control

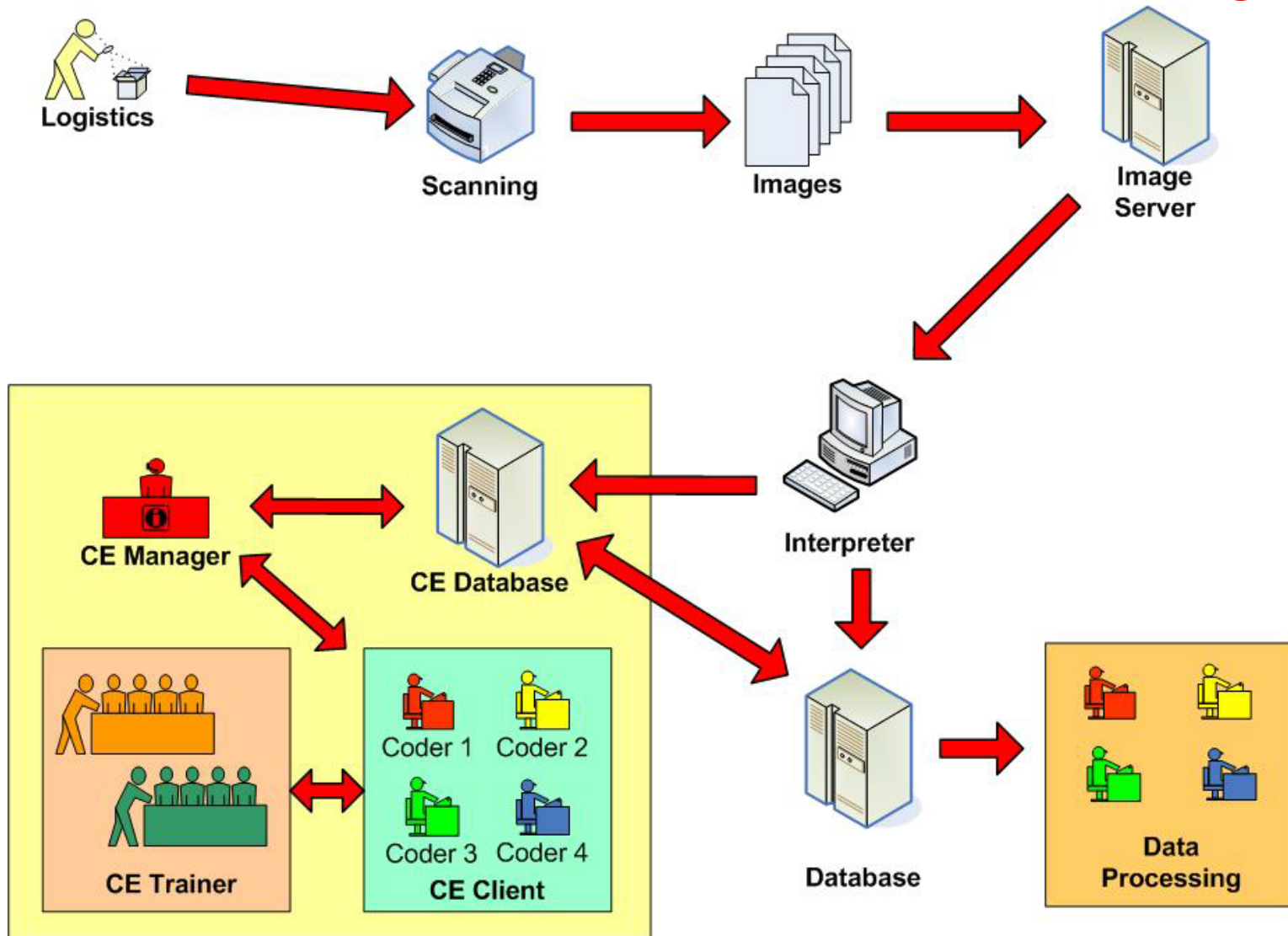
### *3. Why a new coding software?*

- Provider
  - Lack of support and change of activities
  - No room for improvement
- Technical problems
  - Usability (Screen display)
  - Speed problems
  - Lack of stability

## *4. Who was involved?*

- Coding unit
  - Content
  - Testing
- Software unit
  - Programming
  - Testing
  - Interface with data entry and scanning
  - Progress Report and discussion of revisions and next steps every fortnight
- Data management unit
  - Workflow

# 5. Process of Computer Aided Coding



## *6. Modular Software Concept*

The Coding Expert software consists of three modules:

- Administrator module: Coding Expert Manager
- User module: Coding Expert Client
- Training module: Coding Expert Trainer



## 7. *The Coding Expert Manager*

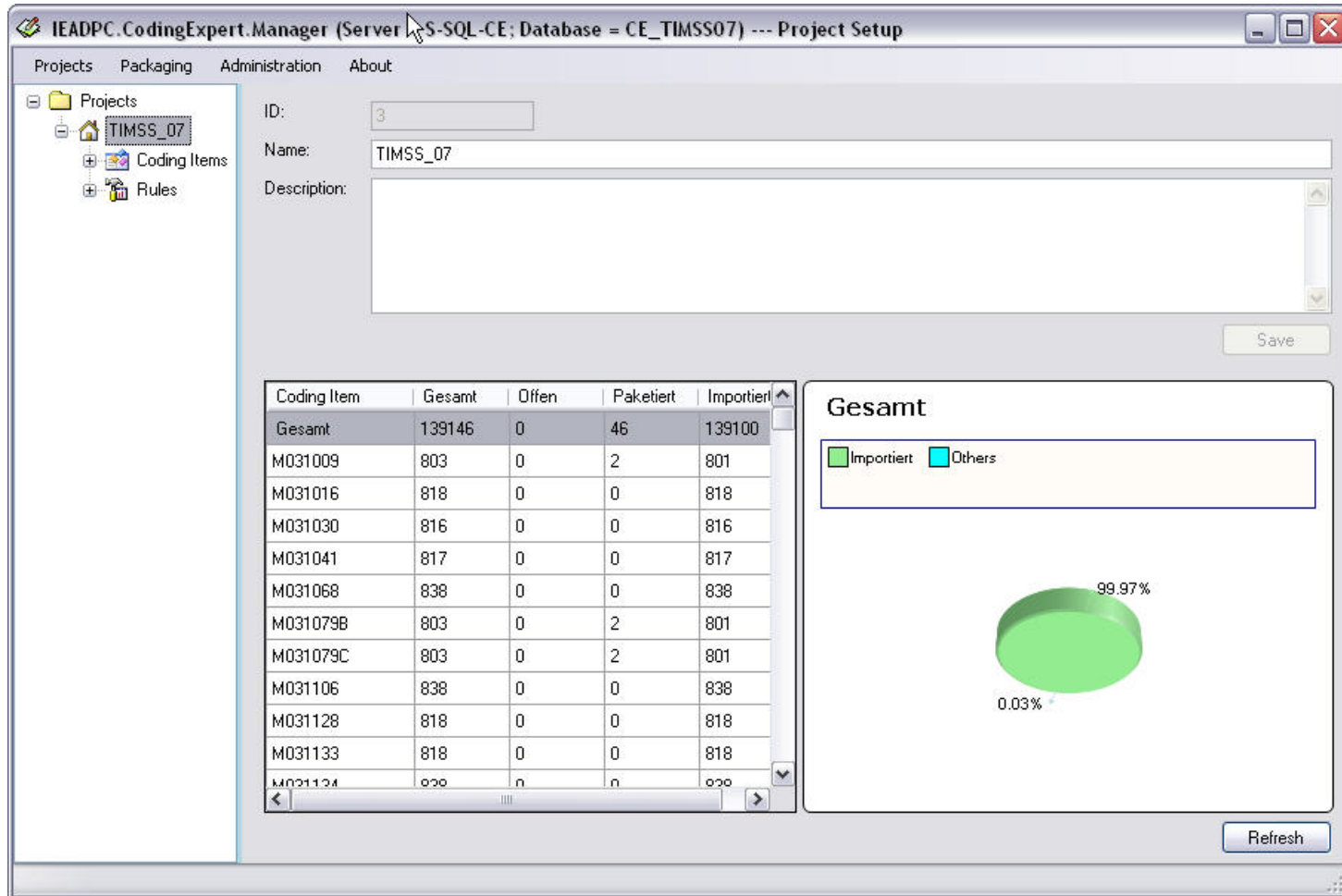


### **Main Functions:**

- Coder administration (who is coding)
- Item definition (what to code)
- Code plan definition (how to code)
- Rule definition (who is coding what and how)
- Management of logistics
  - Creating packages (input for coders)
  - Delivering packages (CD or ftp)
  - Control return (ftp or e-mail)
  - Statistics

# 7. The CE-Manager

## Definition of projects, items, and rules



IEADPC.CodingExpert.Manager (Server) --- Project Setup

Projects Packaging Administration About

Projects

- TIMSS\_07
- Coding Items
- Rules

ID: 3

Name: TIMSS\_07

Description:

Save

Coding Item	Gesamt	Offen	Paketiert	Importiert
Gesamt	139146	0	46	139100
M031009	803	0	2	801
M031016	818	0	0	818
M031030	816	0	0	816
M031041	817	0	0	817
M031068	838	0	0	838
M031079B	803	0	2	801
M031079C	803	0	2	801
M031106	838	0	0	838
M031128	818	0	0	818
M031133	818	0	0	818
M031134	820	0	0	820

Gesamt

Importiert Others

99.97%

0.03%

Refresh

# 7. The CE-Manager



## Item Definitions

IEADPC.CodingExpert.Manager (Server = S-SQL-CE; Database = CE\_TIMSS07) --- Project Setup

Projects Packaging Administration About

Projects

- TIMSS\_07
  - Coding Items
    - M031009 [GEORGIA NEEDS PAGES TO SEND LETTERS (1)]
    - M031016 [WHAT IS THE PRIZE WINNING NUMBER (1)]
    - M031030 [12.36 MINUS 9.7 (1)]
    - M031041 [TRIANGULAR TILES TO COVER THE FIGURE (1)]
    - M031068 [TIME DON, ROB, LYNN TO LEAVE SCHOOL (1)]
    - M031079B [PATTERN OF CIRCLES/FIGURE 5 (1)]
    - M031079C [PATTERN OF CIRCLES/FIGURE 10 (1)]
    - M031106 [MANOS MISSING DIGIT (1)]
    - M031128 [5631 PLUS 286 (1)]
    - M031133 [FAVORITE COLORS OF DARINS FRIENDS (2)]
    - M031134 [JASMIN'S TALLY CHART (1)]
    - M031183 [RECIPE FOR 3 PEOPLE (2)]
    - M031227 [SEANS RULE TO TRANSFORM NUMBERS (1)]
    - M031235 [CHILDREN SHARE SWEETS EQUALLY (1)]
    - M031240 [COMPLETE TABLE BY GENDER WITH HATS (1)]
    - M031242A [RENTING BIKES/FILL TABLE (1)]
    - M031242B [RENTING BIKES/SAME PRICE (1)]
    - M031247 [A MAN TOOK HIS CHILDREN TO A FAIR (2)]
    - M031258 [THE RULE ANN USES TO GET HER NUMBER (1)]
    - M031271 [THE SQUARE IS CUT INTO 7 PIECES (1)]
    - M031274 [DRAW THE REFLECTION OF THE SHAPE (1)]
    - M031282 [NUMBER OF BOYS AND GIRLS IN A SCHOOL (2)]

Item Definition Details:

ID: 233 Name: M031009 Alias: GEORGIA NEEDS PAGES TO SEND LETT Description:

ID: 324 Description:

Buttons: [Icons for file operations and status]

Code	Name	Description
<b>Akzeptable_Antwort</b>		
10	18	
<b>Nicht_akzeptable_Antwort</b>		
70	24	
71	36	
77	Abgeschnitten, nicht lesbar	
79	Andere nicht akzeptable	
<b>Frage_nicht_beantwortet</b>		
99	Leer	

No warnings Save

# 7. The CE-Manager



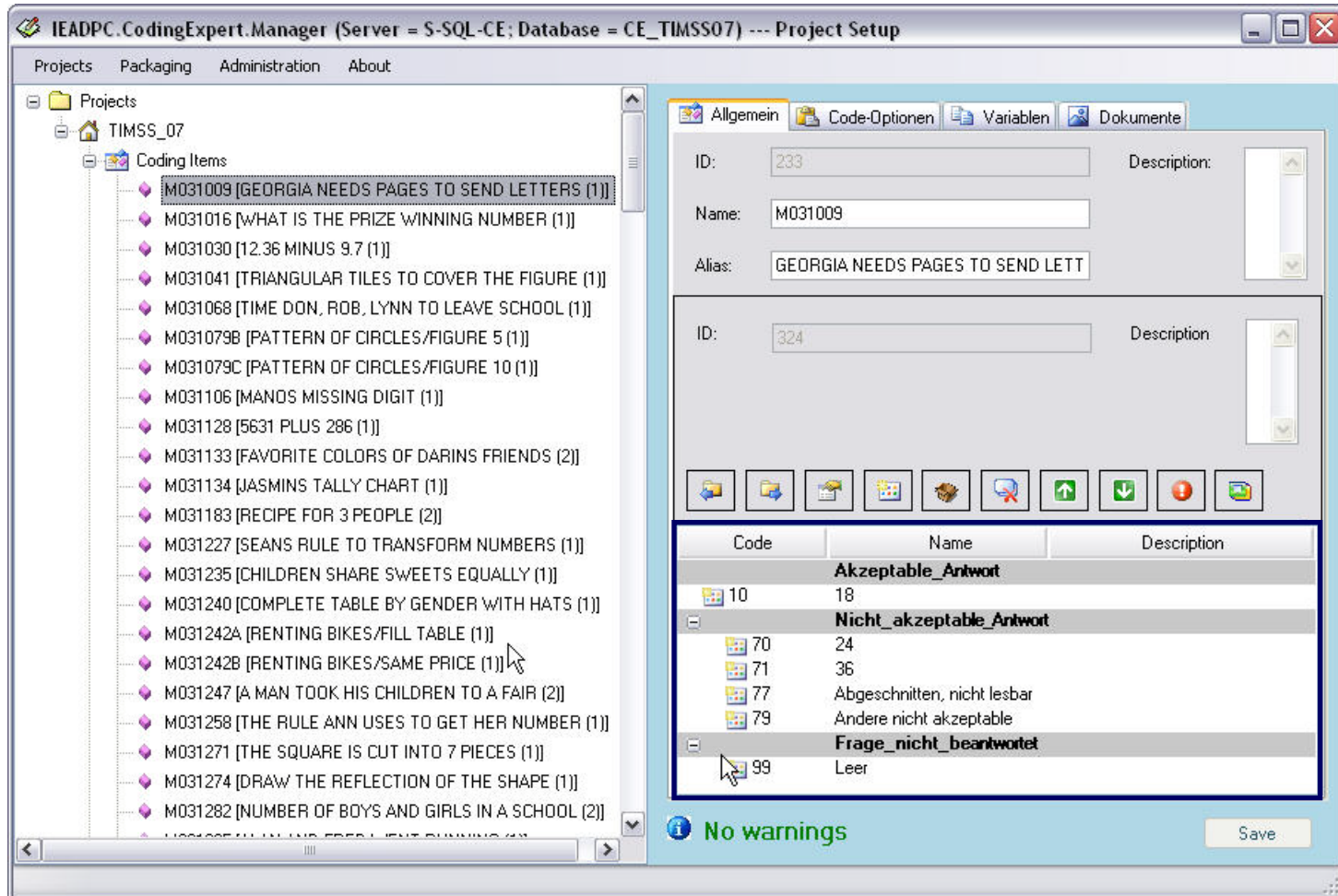
## Item Definitions

The screenshot shows the IEADPC.CodingExpert.Manager application window. The title bar reads "IEADPC.CodingExpert.Manager (Server = S-SQL-CE; Database = CE\_TIMSS07) --- Project Setup". The menu bar includes "Projects", "Packaging", "Administration", and "About". The left sidebar shows a tree view with "Projects" expanded, containing "TIMSS\_07". The main area is titled "Coding Items" and lists several items, each with a purple diamond icon and a description in brackets. The first item, "M031009 [GEORGIA NEEDS PAGES TO SEND LETTERS (1)]", is highlighted with a dashed border. Below the list, a table displays the possible answers for the selected item. The table has two main sections: "Akzeptable\_Antwort" (Acceptable Answer) and "Nicht\_akzeptable\_Antwort" (Not acceptable Answer). The "Akzeptable\_Antwort" section shows a single entry: "10" with the value "18". The "Nicht\_akzeptable\_Antwort" section lists several entries: "70" with "24", "71" with "36", "77" with "Abgeschnitten, nicht lesbar", "79" with "Andere nicht akzeptable", and "99" with "Leer". At the bottom of the window, a status bar indicates "No warnings" and a "Save" button is visible.

Akzeptable_Antwort	
10	18
Nicht_akzeptable_Antwort	
70	24
71	36
77	Abgeschnitten, nicht lesbar
79	Andere nicht akzeptable
Frage_nicht_beantwortet	
99	Leer

# 7. The CE-Manager

## Code Plan and Code Definitions



IEADPC.CodingExpert.Manager (Server = S-SQL-CE; Database = CE\_TIMSS07) --- Project Setup

Projects Packaging Administration About

Projects

- TIMSS\_07
  - Coding Items
    - M031009 [GEORGIA NEEDS PAGES TO SEND LETTERS (1)]
    - M031016 [WHAT IS THE PRIZE WINNING NUMBER (1)]
    - M031030 [12.36 MINUS 9.7 (1)]
    - M031041 [TRIANGULAR TILES TO COVER THE FIGURE (1)]
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    - M031079B [PATTERN OF CIRCLES/FIGURE 5 (1)]
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    - M031133 [FAVORITE COLORS OF DARINS FRIENDS (2)]
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    - M031235 [CHILDREN SHARE SWEETS EQUALLY (1)]
    - M031240 [COMPLETE TABLE BY GENDER WITH HATS (1)]
    - M031242A [RENTING BIKES/FILL TABLE (1)]
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    - M031258 [THE RULE ANN USES TO GET HER NUMBER (1)]
    - M031271 [THE SQUARE IS CUT INTO 7 PIECES (1)]
    - M031274 [DRAW THE REFLECTION OF THE SHAPE (1)]
    - M031282 [NUMBER OF BOYS AND GIRLS IN A SCHOOL (2)]

Code-Optionen Variablen Dokumente

ID: 233 Description:

Name: M031009

Alias: GEORGIA NEEDS PAGES TO SEND LETT

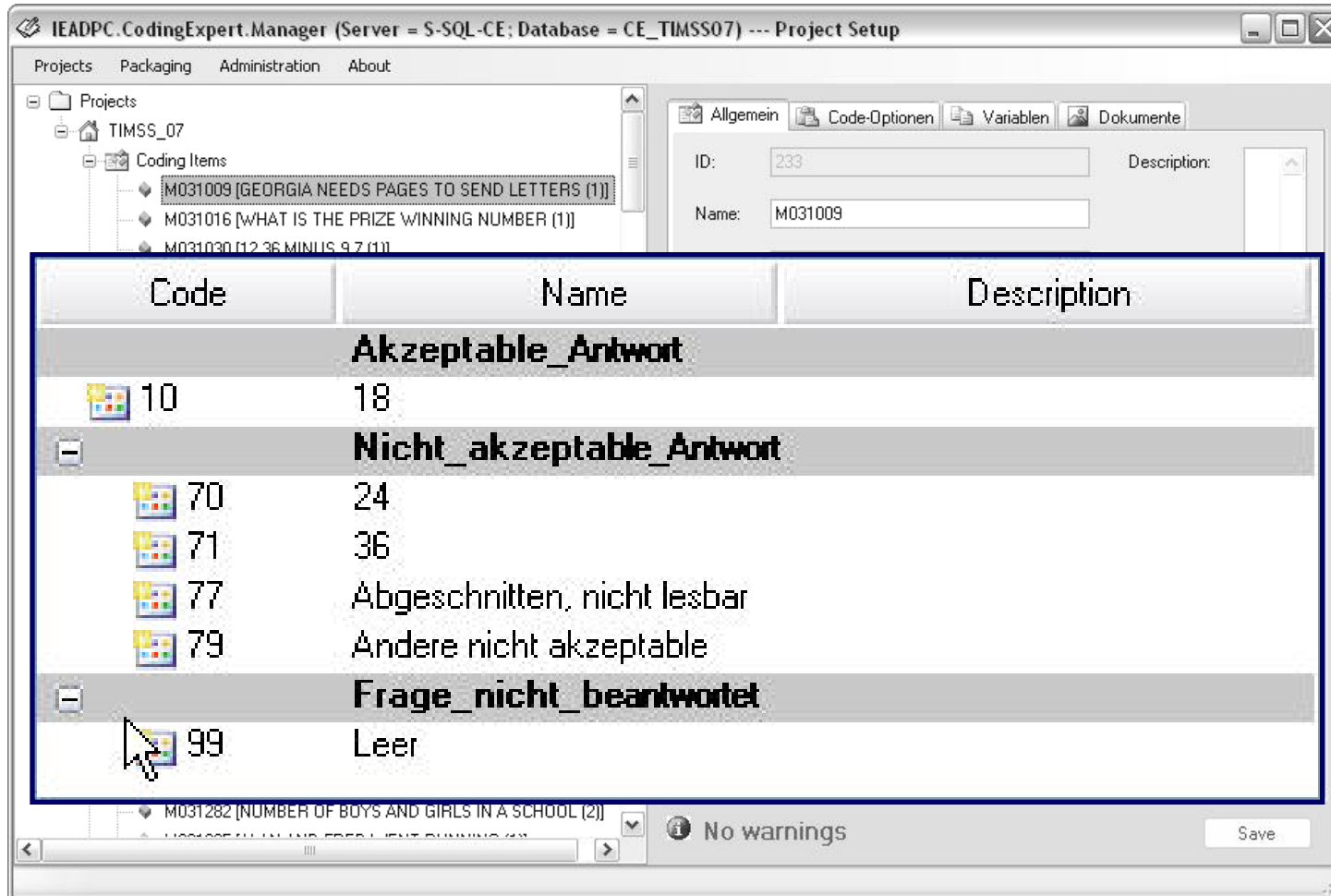
ID: 324 Description:

Code	Name	Description
<b>Akzeptable_Antwort</b>		
10	18	
<b>Nicht_akzeptable_Antwort</b>		
70	24	
71	36	
77	Abgeschnitten, nicht lesbar	
79	Andere nicht akzeptable	
<b>Frage_nicht_beantwortet</b>		
99	Leer	

No warnings Save

# 7. The CE-Manager

## Code Plan and Code Definitions



The screenshot shows the 'IEADPC.CodingExpert.Manager (Server = S-SQL-CE; Database = CE\_TIMSS07) --- Project Setup' window. The 'Projects' pane on the left shows a tree structure with 'TIMSS\_07' and 'Coding Items'. The 'Coding Items' list includes 'M031009 [GEORGIA NEEDS PAGES TO SEND LETTERS (1)]', 'M031016 [WHAT IS THE PRIZE WINNING NUMBER (1)]', and 'M031030 [12.36 MINUS 9.7 (1)]'. The 'Allgemein' tab is active, showing 'ID: 233' and 'Name: M031009'. A table with three columns: 'Code', 'Name', and 'Description' is displayed. The table contains the following data:

Code	Name	Description
<b>Akzeptable_Antwort</b>		
10	18	
<b>Nicht_akzeptable_Antwort</b>		
70	24	
71	36	
77		Abgeschnitten, nicht lesbar
79		Andere nicht akzeptable
<b>Frage_nicht_beantwortet</b>		
99	Leer	

The status bar at the bottom indicates 'No warnings' and has a 'Save' button.



## 7. *The CE-Manager*

### **Advantages:**

- No handling of papers during coding
- Sophisticated package management
- Handling of different coding purposes
  - Coding for the data base
  - Coding of multiple marking items (within and between coder reliability)
  - Coding of training items (comparisons)
  - Coding of transcribed items (occupations)
- Batch processing for packaging (over night)
- Import/export functionalities (code plans, rules)
- Basic statistics to monitor the process

## *8. The Coding Expert Client*



### **Main Functions:**

- Coding
- Transcription
- Recoding of problematic responses or missing codes (single station or network)
- Creation of return files (codes)



## 8. The CE-Client



Image Window, Code Plan Window, Assigned Codes

IEADPC.CodingExpert.Client (K:\Kodierungsprojekte\TIMSS 2007\Sendouts\Sendouts\_Mathe\Sendout\_...

Package View Window About

58%

Gisela möchte an 12 Freunde Briefe schicken. Für die Hälfte der Briefe braucht sie je 1 Blatt, für die andere Hälfte je 2 Blätter. Wie viele Blätter braucht sie insgesamt?

Antwort: 18

Code plan

Code	Name	Description
	<b>Akzeptable_Antwort</b>	
10	18	
	<b>Nicht_akzeptable_Antwort</b>	
70	24	
71	36	
77	Abgeschnitten, nicht lesbar	
79	Andere nicht akzeptable	
	<b>Frage_nicht_beantwortet</b>	
99	Leer	

Navigation

Assigned codes

Code	Name
10	18

Assigned codes Transcription text

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## 8. *The CE-Client*



### **Advantages:**

- No handling of paper during coding
- Coding by item or any other order pre-defined in the manager module
- Sorting function by file size (missing data)
- Help function
- Annotations possible
- Recording of additional information (time per code)

## *9. The Coding Expert Trainer*



### **Main Functions:**

- Display and compare training material on screen
- (Pre-)define master codes
- Display coder agreement
- Display coder annotations and discuss code plan for improvements

# 9. The CE-Trainer



Image Window, Master Code, Code Comparisons

M041302C - M041302C(DRAW A 6-SIDED SHAPE (1)) - D:\...GA\_Example - IEADPC.CodingExpert.Trainer - ...

File << < > >> View Window Setting About

**Coders**

MASTER	10	
steffen	10	
timssm01	11	
timssm02	70	
timssm03	11	
timssm04	10	
timssm05	11	

10	2	Siehe Kodieranweisung
11	3	Siehe Kodieranweisung
70	1	Siehe Kodieranweisung
77	0	Abgeschnitten, nicht lesbar
79	0	Andere_nicht_akzeptable
99	0	Leer

55%

C. Zeichne eine Figur mit 6 gleich langen Seiten in den Kreis.

1. of 100 document(s). - 73353

## 9. The CE-Trainer



### Advantages:

- Immediate comparison of results during the training sessions after coding rounds
- Detection of problematic items
- Detection of problematic coding instructions
  - Categories missing?
  - Instructions ambiguous?
  - Instructions too complex?
- Detection of deviating coders
  - Harshness
  - Leniency
  - Systematic deviations

## *10. Next steps*

- Calculation of agreement indices in the system
- Create links to the bookkeeping system
  - Generation of invoices for coders
  - Controlling
  - Approval system
- Explore possibilities and conditions to make modules available for others
  - Most likely for the client module
  - Training module also possible, but would require some effort for modification
  - Manager module is tailored for the IEA DPC environment

*Many thanks for your attention!*