



INFORMATION AND COMMUNICATION
TECHNOLOGIES IN EDUCATION

APPROACH TO TEACHING
OF INFORMATION SYSTEMS

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- Introduction
- Structure and content of the course
- Motivational aspects of the course
- Example
- Conclusion



The article presents the experience gained in teaching the course named 'Development and administration of IS', which is based on a structured approach.

The professional development of IS for commercial use is being executed through agile methodologies and object approaches.

Predominantly, web applications are being created, and working with IS by using mobile devices is being solved.

The course is specified for study as follows:

1. The introductory course in the IS programme for future ICT specialists.
2. The course providing basic information about IS for future specialists in business (economics, management, etc.).

The course begins with the analysis of IS issues.

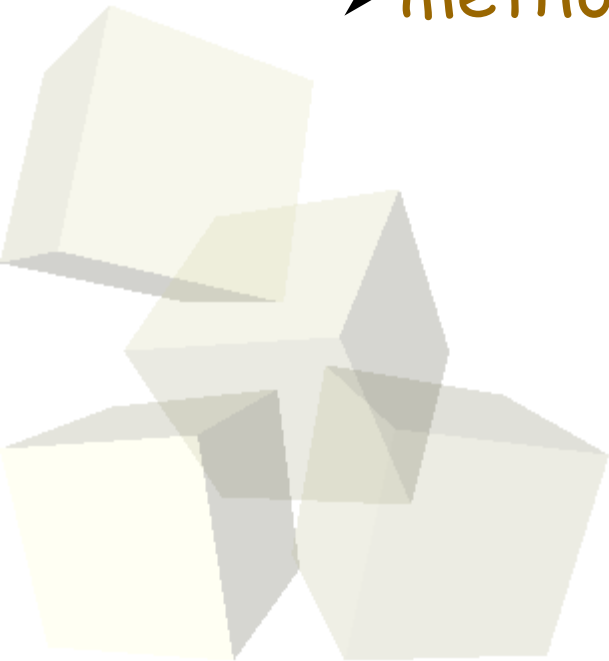
It includes the following topics:

- the concept of IS, its meaning and classification,
- data - information - knowledge,
- database system and its data structures,
- the function of database management system,
- and database properties.

Then follows the teaching of the IS modelling.

It includes the topics of the:

- IS model, general principles of modelling,
- IS life cycle,
- methodology - method - technique - tool.



After that a structured approach to IS development and a conceptual level of modelling are introduced.

This part is the core for understanding the field and the proper basis for analytical thinking. The structured methodology is explained.

The constructs and rules of the:

- entity-relationship diagram,
- functional scheme, and
- data dictionary are presented.

In the last part of the course, the logical and physical levels of IS modelling are introduced.

They include the relational data model (RDM), the transformation of the ERD to RDM, RDM normalization, and relational operations.

The development environment of the DBMS MS Access and the description of the basic elements of the application (table, query, form and report) are presented.

The above mentioned structure of the course is suitable for teaching the ICT specialists.

In the case of the 'business' oriented students, some of the passages can be omitted or modified.

It is not necessary to present the details of DBS, it is possible to replace the RDM by the 'table view of data', to omit normalization and relational operations.

In addition, this group of students could become more familiar with the MS Access.

Motivational aspects of the course 1/2

The basic motivational tool is continuous repetition of the teaching content and checking the students' skills and knowledge by testing them. Their test results are part of the final evaluation.

In addition, the process of the IS creation is checked individually, step by step; the ERD design and its transformation into the RDM are discussed.

A well-proven motivational aspect is the choice of the IS theme according to student's interest.

It is easier to design and create an IS when the student is familiar with its environment.

It can be summarized that the most popular topics for IS creations are:

- ✓ ICT (computers, graphic cards, mobile phones, software, data media, satellite communication, errors of security codes, overview on signals).
- ✓ Trade and services (car or motorcycle sales, car service, mobile phones, music, food). Machinery (automobiles, motorcycles, weapons).
- ✓ Music (music bands and singers, recorded music, DVD, musical instruments).
- ✓ Sports competition (soccer, fire sports, athletics, shooting, body building).
- ✓ Teaching (student records, future practice for students, eLearning exercises).

The example presents student's work in the theme is 'Guitars'.

Based on the documentation of this assignment, the following parts are presented:

- Assignment for the IS development.
- Entity-relationship diagram (ERD).
- Data dictionary (DD).
- Functional scheme (FS).
- Relational data model (RDM).
- Description of the final application.

Assignment specification:

Create an IS about internet shop with guitars.

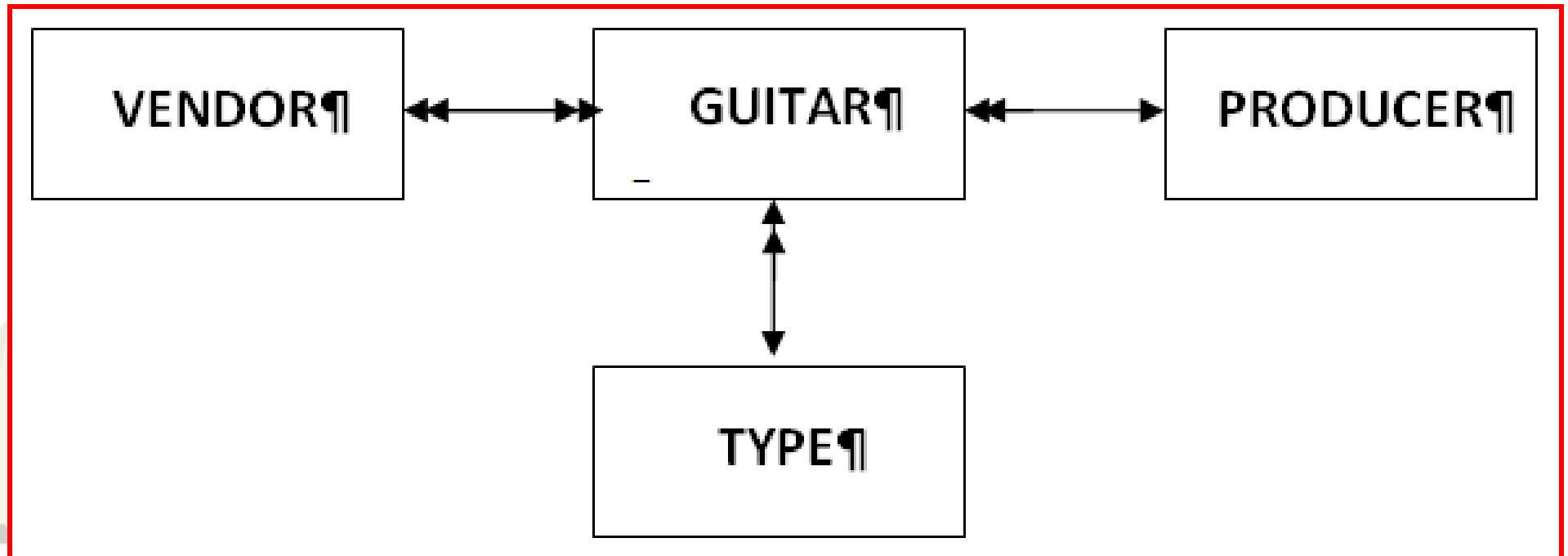
Register vendors and producers, their name, website, contacts (phone, email).

Additionally to record data on the guitar, its name, type, price, color, sensors, wood, scale, frets, tremolo, and the number of pieces on a stock.

These items is possible to insert into IS, update, sort, and search.

For users of IS must be available a list of developers, of stores, report of guitars by price, producer and vendor.

Entity-Relationship Diagram:

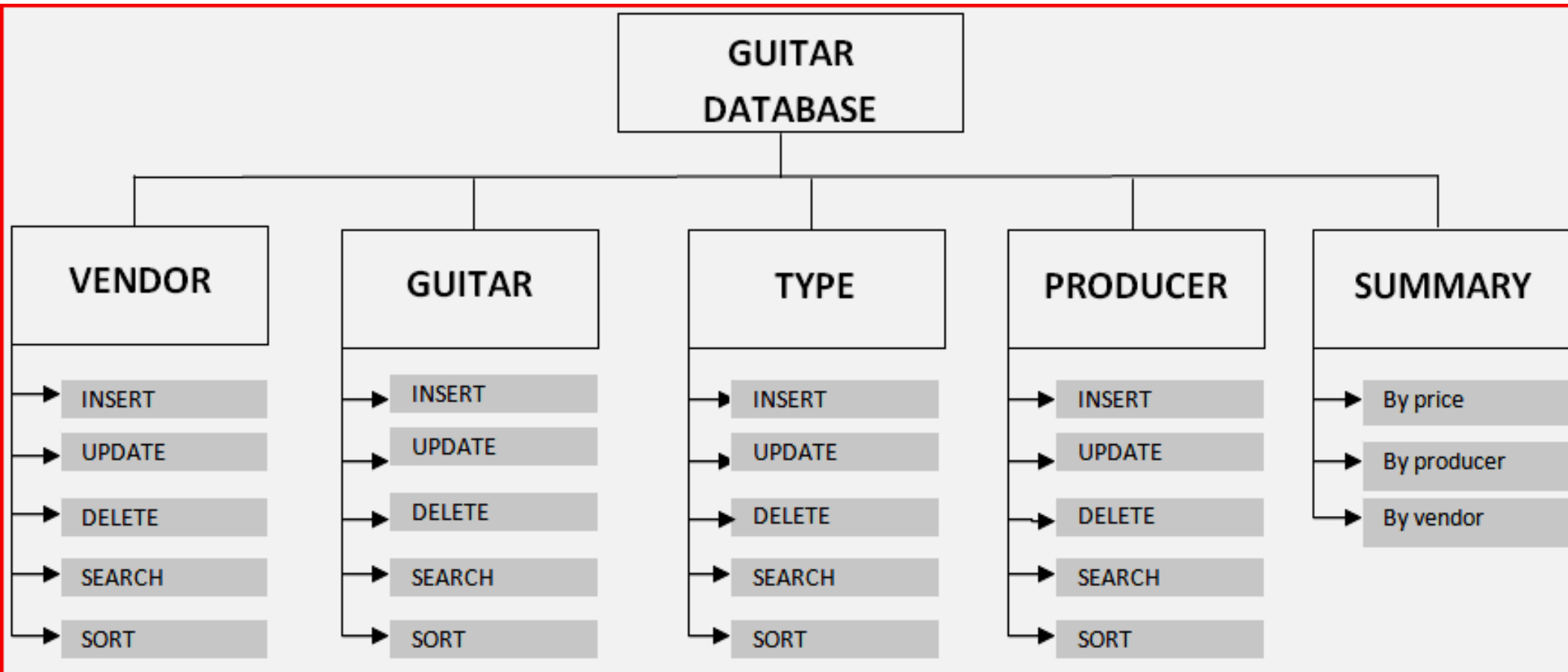


Example 4/7

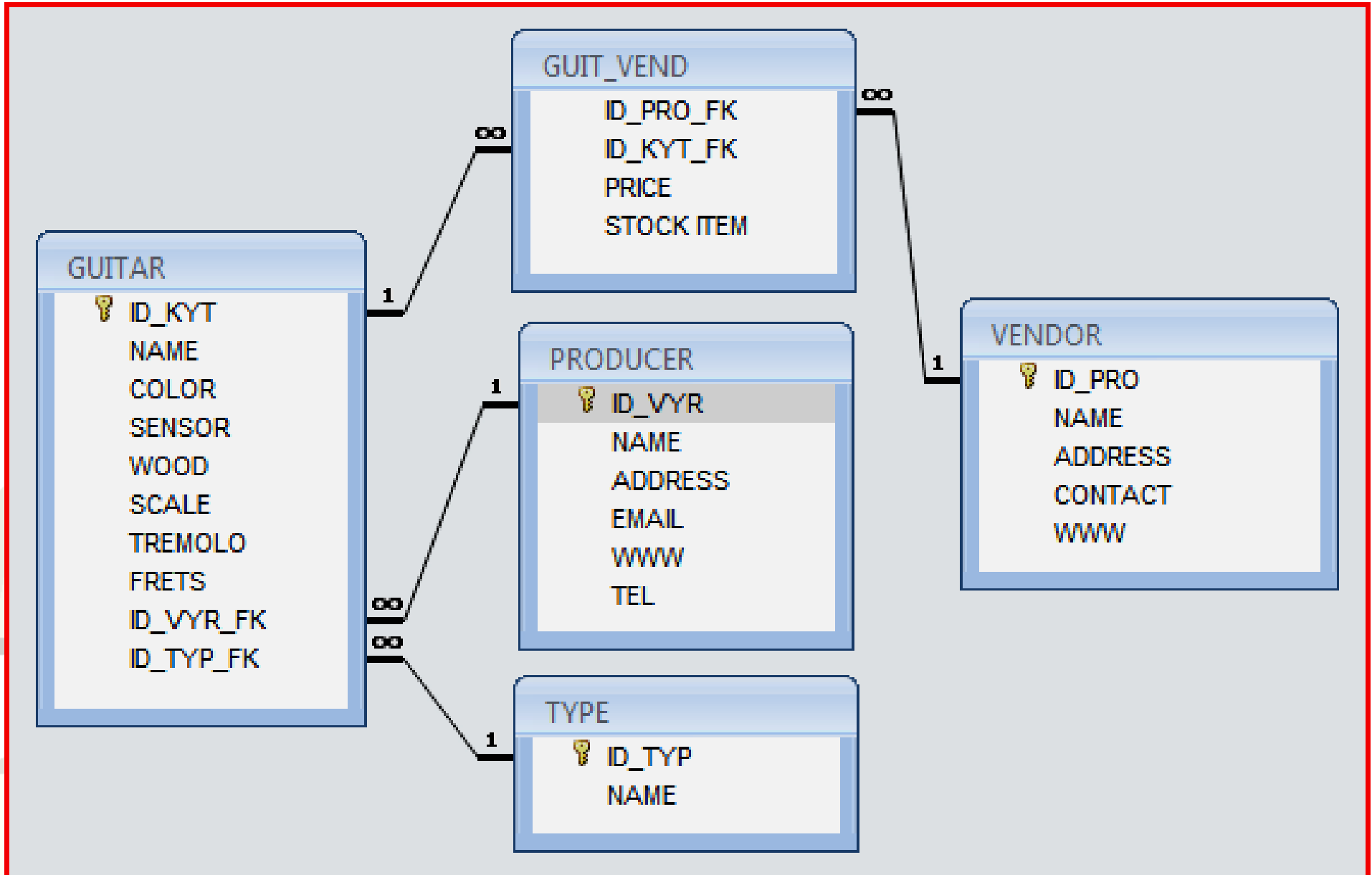
D a t a D i c t i o n a r y

Entity	Attribute	Data type	Length	Obligat.	Key
GUITAR	ID_KYT	aut. num.	6	YES	PK
	NAME	text	30	YES	
	COLOR	text	50	YES	
	SENSOR	text	30	YES	
	WOOD	text	70	YES	
	SCALE	number	3	YES	
	TREMOLO	text	3	YES	
	FRETS	number	2	YES	
	ID_VYR_FK	number	6	YES	<i>FK</i>
	ID_TYP_FK	number	6	YES	<i>FK</i>
VENDOR	ID_PRO	aut. num.	6	YES	PK
	NAME	text	30	YES	
	ADDRESS	text	30	YES	
	CONTACT	text	30	YES	
	WWW	text	40	YES	
PRODUCER	ID_VYR	aut. num.	6	YES	PK
	NAME	text	30	YES	
	ADDRESS	text	45		
	EMAIL	text	30	YES	
	WWW	text	45	YES	
	TEL	text	45	YES	
TYPE	ID_TYP	aut. num.	6	YES	PK
	NAME	text	30	YES	
GUIT_VEND	ID_PRO_FK	number	6	YES	<i>FK</i>
	ID_KYT_FK	number	6	YES	<i>FK</i>
	PRICE	number	15	YES	
	STOCK ITEM	number	10	YES	

Functional Scheme:



Relational Data Model:



Description of the final application:

IS GUITARS

INSERT/UPDATE/DELETE

GUITAR VENDOR PRODUCER

PRODUCERS SUMMARY

VENDORS SUMMARY

GUITARS SUMMARY

SORT BY PRODUCER

ESP SHECTER

BCRICH LTD-ESP IBANEZ

SORT BY VENDOR

MUSICCENTER GUITARS MUSICCITY

PRICE SORT

0-10000

10000-20000

20000-30000

30000-40000

40000 a více

The primary goal of the course is to gain basic information about IS environment and IS development.

An important benefit of the course is the development of students' ability to work independently and to document the results of their work.

The evaluation of the documentation of their IS is aimed at encouraging students to prepare the high quality documentation.



Thank you for your attention!

