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**METHOD FOR CREATING A FLEXIBLE AND EFFICIENTLY DISTRIBUTED
EDUCATIONAL SYSTEM, IN A COMPUTER ENVIRONMENT, WITH THE
POSSIBILITY TO PROTECT INSTRUCTIONS AND DATA**

The invention describes a method for developing a flexible and efficient distributed educational system with the opportunity to protect instructions and data, or distributed systems alike in a computer environment consisting of a

5 network of user and server computer devices, as for example computer devices connected to the Internet or other type of sending/receiving devices, such as CD-ROM, network computers, interactive television etc.

10 Systems of the above mention type is for example known from US patent no. 5 484 293, no. 5 537 141, no. 5 528 281, no. 5 684 952 and no. 5 318 450, which illustrates educational systems connected through a network.

15 Educational systems, which uses direct access to for example the Internet, easily becomes out of control for the user of the system. This not at least due to the large quantities of data being distributed by networks like the Internet, where the user normally - as soon as being connected to for example the Internet - begins to zap or "surf" around. The consequence is that the educational situation becomes
20 unstructured and it means that the student only obtains an overall introduction to the course.

25 It is furthermore a well-known case with for example the Internet, that instruction sets and data not optionally for the sending part can be protected against printing, meaning copying of a given object.

Besides that the Internet and other computer networks is able to deliver large quantities of data, it is also a well-known situation that the distribution of data might be time-consuming, specially at certain times, where a large number
30 of users is connected. This put into perspective, that the instructions used for handling data, sometimes are being executed as function expressions, which equal to data are being distributed through the Internet and computer networks alike, hereby contributing to an, at certain times
35 unacceptable "large traffic" on the Internet.

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It is the purpose of the invention to describe a method of the initially mention type, which ensures that the user of the educational system is offered necessary data, represented in a manageable way with the lowest possible
5 time delays when distributing data, and that the user optionally is able to protect instructions and data in the form of a given object against printing and copying.

The purpose of the invention is enabled by the systems being developed of instruction sets, stored in a user computer
10 device, server computer or other type of sending devices, and which can both be distributed in total or partly separated from data, or together with data, wail the instruction sets is used to manage both data, being distributed from server computer devices and/or other
15 sending devices, and data, being stored in the user computer devices.

In this way a method is created for developing an educational system in a computer environment, where it is possible in a controllable way to distribute data, of
20 relevance for a course, at the same time the instruction sets ensures that only relevant data are being distributed either from the user computer device or from, for example the Internet.

As specified in claim 2, the method is characterized by, the
25 instruction sets being user specified and stored in the users computer device in a way, that the opportunity of copying instruction sets and data optionally can be prevented.

An advantage of using such an approach is that the supplier
30 of an educational system is able to develop static structures of instructions, related to individual courses, which cannot be copied, at the same time preventing the educational system and course content to be pirate copied resulting in a loss for the supplier.

35 A key issue in general in the area of electronic distribution and commerce.

A suitable method of developing an educational system is, as specified in claim 3, that the instructions sets is related to managing and executing educational topics, such as "overview map", "self-study", "lecture", "group
5 collaboration", "browse" and "general instructions".

This method of separating the instruction sets primarily has the advantage, that development of courses with different contents to some extent becomes standardized, hereby minimizing the cost of developing different courses to the
10 lowest possible extend.

To further enable the best possible course structure, it is an advantage, as specified in claim 4, that the instruction sets is organized for creating and editing, administrating, analyzing and use of a total knowledge
15 transformation process

In this way all aspects of an educational situation is procured in an easy way.

For further transformation of the "real life" educational situation to an educational situation in a computer
20 environment, it is suitable, as specified in claim 5, that the topics are being presented as multimedia objects based on integration of one or more information types, such as a video, a series of sounds and pictures, a series of slides, a text, a graphic or a sound program.

25 Wail, as mentioned above, the topics is presented as multimedia objects, the invention is further flexible by presenting these as a dialog between one or more users and the multimedia object, or as a dialog between one or more users through the multimedia object.

30 If multiple persons wishes to use an educational system in a computer environment, it is an advantage, as specified in claim 7, that multiple users at the same time is able to be connection to educational programs.

The flexibility and efficiency of the educational system is also increased if, as specified in claim 8, only data in the form of contents, for example educational contents, which is related to static function expressions, such as an index, is distributed from server computers or other sending devices.

This primarily provides the advantage, that those data, which for example exists on the Internet, can be distributed in a special suitable way, if the function related expressions, which is related to the specific data, are being controlled by the instruction sets.

Finally it is, as specified in claim 9, an advantage that during execution of the educational program data is frequently updated from server computer devices or other sending devices.

This ensures that the supplied course system always is fully updated with the latest knowledge.

The invention shall now be explain in more detail refering to an execution example illustrated on the drawing, on which

fig. 1 illustrates a normal computer environment, which can be used when implementing the invention,

fig. 2 illustrates a flowchart of a normal educational system, where a user/server communication are used,

fig. 3 illustrates a flowchart of a user/in connection with implementation of the invention,

fig. 4 illustrates a flowchart of the most important sub elements, which according to the invention is included in the educational system, wail

5 fig. 5 illustrates an example of a user interface in a display.

On fig. 1 is an example of a computer system illustrated in a flowchart, which consists of a microprocessor 12, to which, by a bus 18, is connected storage's 14, 16 in the form of ROM-storage and RAM-storage. Furthermore, to the
10 bus, is connected a display 20, a speaker 22, a disc drive 24, a CD-ROM drive 26 and an input- and output device 28, which also is connected to a, not illustrated, modem or other type of communication device, for example for an Internet connection. Such systems is also known as
15 multimedia systems and is in itself well-known, therefore not being further explained in more detail here.

On fig. 2 is illustrated a normal computer based learning environment, which consists of a computer environment, such as a PC-environment 100, for example as the one illustrated
20 on fig. 1. This can be executed as illustrated in the box 104. Afterwards instructions can be selected by 106, which as illustrated schematically can consist in showing and retrieving instructions and data from a user computer, server computer or another type of sending device
25 illustrated by 120, 121 or directly from the application and the user computer illustrated by 110, 111 and 112. Instructions and data can be printed, this means copied illustrated in 122. A process, which can be continued as, illustrated by the backwoods connection from the box 122 to
30 box 106.

On fig. 3 is illustrated a flowchart of the elements included in the educational system according to the invention. This system is differentiated from the system illustrated on fig. 2 by, containing the same elements as
35 illustrated on fig. 2, but also including other boxes according to the invention than the boxes illustrated on fig. 2. Boxes, which on fig. 2 start with reference, number 1, starts on fig. 3 with 5.

Beside the on fig. 2 illustrated the flowchart on fig. 3, contains the box 608, expressing the instruction sets, which is specified by the supplier of an educational system. This instructions set can, as illustrated by 610, retrieve data
5 related to the instructions, from both the user computers, server computers, such as computer connected to the Internet, or other type of sending devices. Also the instruction sets can execute general or user specific instructions, illustrated by 510, or retrieve instructions
10 and data, illustrated by 520, from the user computer, server computers or other type of sending devices.

The instruction set can controll other instructions by box 611, both for finding and retrieving and showing instructions, possibly data, separated or together, related
15 to general and customer specific educational systems, illustrated by 511 and 512, and showing contents from the data, possibly instructions, separated or together, which is found in 520, illustrated in box 521.

In the box 620 data, possibly instruction sets, can,
20 depending on the in 610 retrieved instruction data, be printed to external devices, illustrated in 622, such as a disc drive, a printer or alike, meaning the distributed object being copied.

The process continuous so that it is possible to retrieved
25 and execute new instructions and distribute new data from the user computer, the server computer or other sending devices.

On fig. 4 is illustrated in more detail how educational systems are being developed by a supplier. The system allows
30 a supplier to develop and make it possible to execute an educational system, illustrated by 300, by choosing a number of topics illustrated in the boxes 310, 320, 330, 340, 350. The box 310 provide the supplier with the opportunity to choose instruction sets, being divided into topics, such as
35 "overview map",

illustrated by 311, "self-study" illustrated by 312, "lectures" illustrated by 313, "group collaboration" illustrated by 314, "browse" illustrated by 315 and "general instruction".

- 5 By suitable structuring of contents in these boxes the overall structure of an educational system, according to the invention, is generated. For example it is possible by box 312 to insert a multimedia document, an index, an appendix, etc. In box 313 it is for example possible to insert a video
10 or a sound channel and possibly slides, create study groups, administer questions and answers between participants, and create lists of participants, which is related to a lecture. By 314 it is possible to insert messages or slides, among other about study groups, and questions and answer between
15 participants. By the box 315 it is possible to choose instructions, which connects the educational system and course contents to the Internet. In the next column, named 320, is illustrated an administration system, divided into a number of sub functions, such as inserting and removing
20 parts of a course. Also it is possible in box 322 to insert, edit and remove instructions, which are user related. In box 323 different administration data is handled, such as registration of the use of the educational system, payment etc.
- 25 In the box 324 instructions related to questions for users, is administrated. Finally it is possible in box 325 to test and analyze user performance. Until now on fig. 4 is mentioned those parts of the flowchart, which relates to the actual development of an educational system using
30 instruction sets, used by the supplier/author, that develops the system.

It is possible to choose, whether data and instructions shall be distributed together or separated, whether objects shall be executed from sending and/or receiving devices,
35 also whether data and instructions shall be protected against being printed out and copied.

When executing the system, where one or more users is able to participate, the boxes 340 and 350 on fig. 4 illustrated the more

user specific part, used for the course. As seen the box 340 illustrates classifications into overview maps of, what among other is included in the course system, and as it is illustrated contents of the boxes 341-346 is analog with
5 that found in the boxes under 310, more specifically the boxes 311-316, except from box 340 being total or partly protected against editing and development of the educational system and course contents. When the system is used, there is by 350 illustrated a box for execution of the system.
10 After which in box 300 is illustrated choosing-courses, and here after in box 302 choose-the-instruction-sets. The boxes 351-355 are analog to the boxes 341-345. The difference between the boxes, which is under 340, and the boxes, which is under 350, is, that the boxes under 350 total or partly
15 is protected from editing, developing and copying of the educational system and course contents, besides being total or partly protected from use of instructions related to user performance.

For practical implementation on a computer, it is possible,
20 as illustrated on fig. 5, to create an overview map in which the boxes 310, 320, 340 and 350 from fig. 4 can be executed on the on fig 5. illustrated display. Besides this, is on the same figure, illustrated some help functions, which furthermore eases the use of the educational system
25 according to the invention. The on fig. 5 illustrated overview map shall only be understood, as an example of an user interface. It is therefore possible, that the overview map contains other functions such as those represented on the boxes on fig. 4.

What is claimed is:

1. Method for developing a flexible and efficient educational system or distributed systems alike in a computer environment consisting of a network of user computer devices and server computer devices, such as
5 computers connected to the Internet or other sending/receiving devices, such as a CD-ROM, network computers, interactive television etc. c h a r a c t e r i z e d by the system being developed by instruction sets, being stored in the users computer device, and/or server computers
() 10 or other sending devices and which both can be distributed in total or partly separated from data, or together with data, because the instruction sets are being used to handle both data, being distributed from server computer devices and/or other sending devices, and data being stored in the
15 user computer devices.
2. Method according to claim 1, c h a r a c t e r i z e d by, the instruction sets possibly being user specified and stored in the users computer devices in a way that the opportunity to copy instruction sets and data optionally can
20 be prevented.
3. Method according to claim 1 or claim 2, c h a r a c t e r i z e d by, the instruction sets being related to managing and execution of educational topics, such as "overview map", "self-study", "lecture", "group
25 collaboration", "browse" and "general instructions".
4. Method according to claim 1 to 3, c h a r a c t e r i z e d by, the instruction sets being organized for creating and editing a total knowledge transformation process

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5. Method according to claim 3, c h a r a c t e r i z e d by, the topics being presented as a multimedia object based upon integration of one or more types of information, such as a video, a series of sounds and pictures, a series of slides, a text, a graphic or a sound program.
6. Method according to claim 1-5, c h a r a c t e r i z e d by, all educational topics being presented as a dialog between one or more users and the multimedia object, or as a dialog between one or more users through the multimedia object.
7. Method according to claim 1-5, c h a r a c t e r i z e d by, multiple users at the same time is able to be connected to the educational program.
8. Method according to any of the before mentioned claims, c h a r a c t e r i z e d by, only data in the form of contents, for example educational contents, related to static function expressions, such as an index, are being transferred from server computers or other sending devices.
9. Method according to any of the before mentioned claims, c h a r a c t e r i z e d by, during execution of the educational program data are being frequently updated from server computer devices or other sending devices.