Domain Instruction Server (DIS)

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Abstract

Web based instruction is growing at an incredible rate. Teachers, instructors, trainers and several others are putting their instructional content online. The format, style and media types vary from instructor to instructor. In essence web based instruction is being done by an unknown number of people in an unknown number ways using different media types and platforms. In this paper, an instruction repository will be introduced that has the ability to unite all web based instruction under one umbrella. The media types, platforms, instructors and formats will remain independent. The repository will create a new instructional model for Web based instruction.

1. Introduction

In the traditional classroom, there exists a one-to-many instructor-student ratio. There is one instructor teaching many students. In a tutoring environment, there exists a one-to-one instructor-student ratio. In this paper, the instructional model will be changed to a many-to-one instructor-student ratio [3]. Creating a distributed repository of instruction will provide each student with many instructors facilitating a many-to-one instructional model. In this instructional model, the major task is matching students to instructors that accommodate their learning style [1]. In the sections that follow, the architecture for a distributed instruction repository will be introduced.

2. Repository Model

The internet consists of several domain name servers. Each domain name server contains a list of domain names, i.e.: www.eng.auburn.edu , and a corresponding IP address. When a browser connects to the Web, it will ask a domain name server for an IP address before it is connected to the requested web site. This model can be adopted to create an instruction repository that consists of domain names and other instructional meta data.

In the instruction repository, users can submit queries that will yield a domain name. The domain name will correspond to an instruction unit on the web. This function is similar to the domain name service, but it also models credit card processing on the web. For example, most electronic commerce sites buy or lease merchant services from a merchant service provider. The merchant service provider gives the store owner access to their credit card processing server. The store owner submits a query to the credit card processing server and the server returns a response code. The response code informs the store owner of an acceptance or rejection of the credit card transaction. This model of credit card processing fits a model for the creation of an instruction repository called DIS.

3. Domain Instruction Server (DIS)

The Domain Instruction Server (DIS) is a repository consisting of web deliverable instruction units. A single unit of instruction is defined as an instruction unit. In traditional terms a single unit of instruction can be viewed as a lesson found on a syllabus. The sequential organization of a collection of instruction units defines a course. Instruction units are created by an instructor and placed on a web server. The web server may belong to their college, department, company, internet service provider or it may be their own personal machine. In any case, the web server is world accessible and it contains their instruction units. Each instruction unit has several common attributes. These attributes can be viewed as instructional meta data. By collecting several instruction units from several instructors the repository creates a high level view for each course as seen in figure 1.

In figure 1, there are three instructors teaching the same course. This course is composed of five lessons and fifteen different instruction units. Each row in figure 1

illustrates that each lesson is taught three different ways using three different instructors. The columns under each instructor illustrate the use of different instructional methods used by the individual instructor. Each instructor teaches the same course using a different media type or style. Each rectangle in figure 1 is an instruction unit consisting of instructional meta data. Figure 1 is a high level view of the DIS organization. The lower level architecture is discussed next.

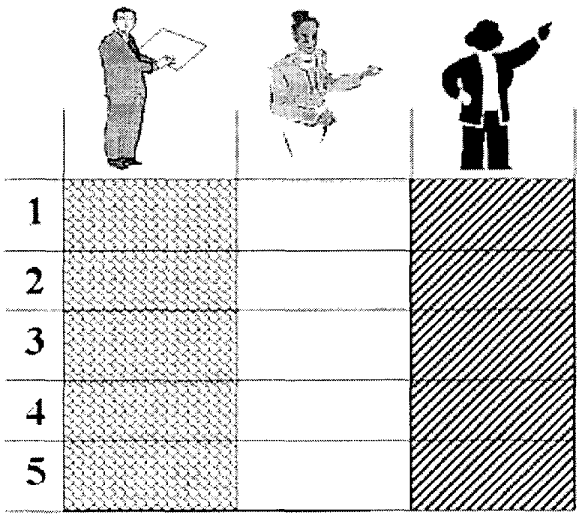

Figure 1. High level course view.

3.1. DIS Architecture

The architecture that supports the DIS environment is very flexible. The primary objective in defining the architecture is to obtain total flexibility with respect to varying platforms across various implementations. This architecture must be platform independent, universally accessible and easy to use. With these requirements in mind, the architecture in figure 2 was defined.

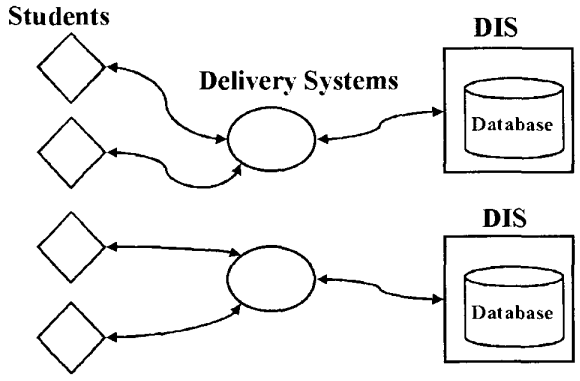

Figure 2. DIS architecture.

In figure 2, there are three layers. The first layer consists of the students. These are designated by the diamonds. The students are using a web browser to connect to the second layer, delivery systems.

Delivery systems are the middleware that provide instructor flexibility for their instruction unit selection process. Within the DIS architecture, there exists the concept of instruction method selection. As described by figure 1, the DIS contains several instruction units. These instruction units have to be selected for use. The process of selecting an instruction unit for use is called "instruction method selection" [2] The final layer is the server layer.

The server layer is composed of domain instruction servers. Each server contains the same repository information. The delivery systems request instruction units from the domain instruction servers. Upon receipt of the instruction unit, the delivery systems will deliver instruction to the student's browser.

4. Conclusion

The DIS environment is being created to unify web based instruction. This environment also serves the purpose of changing the instructional model from the traditional one-to-many or one-to-one models to a many-to-one instructor-student relationship model. This new model of instruction will link students to instructors that before now, may have been impossible to learn from. This environment also creates a repository of instruction that is modeled after existing, yet proven technologies, i.e. domain name server. The future design and implementation will consists of a synchronous component in order to facilitate group participation.

5. References

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