Towards
E-Learning Management System Using Semantic Web Technology and Develop a Universal Namespace for University Domain

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Abstract—Today’s World Wide Web (WWW) is known as Web 2.0. It includes social networking sites, blogs, wikis, video sharing sites, hosted services, web applications, mashups and folksonomies. It also includes E-learning Management system. It is a process in which we use the electronic medium to access the defined set of applications, and processes. Research works in the field of E-Learning are represented by a broad spectrum of applications, ranged from virtual classrooms to remote courses or distance learning. Web-based courses offer obvious advantages for learners by making access to educational resource very fast, just-in-time and relevance, at any time or place. Because of a lot of limitations using web 2.0 for creating E-learning management system, now-a-days we use Web 3.0 which is known as Semantic web. It is a great platform to represent E-learning management system that recovers the limitations of Web 2.0. It represents a potential technology for realizing e-Learning requirements Research works in the field of e-Learning are represented by a wide range of applications, ranged from virtual classrooms to remote courses or distance learning. In this paper we present “Towards E-Learning Management System Using Semantic Web Technology and Develop a Universal Namespace for University Domain”, where course syllabus, teaching methods, learning activities and learning styles are included and it will be more suitable in different learning institutions in Bangladesh. This paper presents the basic information about Learning Management System, E-learning, Semantic Web and the proposed model of Learning Management system using semantic web and a namespace to represent an university on semantic web. We hope that it will provide a great feedback from both teachers and students.

Keywords -- E-Learning Management System, Semantic web, RDF, Ontology.

I. INTRODUCTION

Electronic base training is known as E-learning. A learner learns the instructional contents through the electronic technology. E-learning has a wide range of learning strategies and technologies; from CD-ROMS, videoconferencing, TV lectures, and virtual educational work, corporate universities and many more but our main focus is on virtual education, based on Semantic web [1].

Semantic Web is a group of methods and technologies to allow machines to understand the meaning - or "semantics" - of information on the World Wide Web. It was “invented” by Tim Berners-Lee (amongst others), a physicist working at CERN in 1980s. Furthermore, Semantic Web is about explicitly declaring the knowledge embedded in many web-based applications, integrating information in an intelligent way, providing semantic-based access to the Internet, and extracting information from texts [2].

Unfortunately, the Web was built for human consumption, not for machine consumption, although everything on the Web is machine-readable, it is not machine-understandable [3]. We need the Semantic Web to express information in a precise, machine interpretable form, ready for software agents to process, share, and reuse it, as well as to understand what the terms describing the data mean. That would enable web-based applications to interoperate both on the syntactic and semantic level.

In this paper, we create a namespace of universities that identify any universities that could be helped to build for E-learning Content Management System using Semantic web technologies such as Resource Description Framework (RDF), RDF Schema (RDFS), Web Ontology Language (OWL), Uniform Resource Identifier (URI), XML, and SPARQL.

II. RELATED WORK
F. P. Rokou et al. distinguished three basic levels in every Web-based application: the Web character of the program, the pedagogical background, and the personalized management of the learning material [4]. They defined a Web-based program as an information system that contains a Web server, a network, HTTP, and a browser in which data supplied by users act on the system’s status and cause changes. The pedagogical background means the educational model that is used in combination with pedagogical goals set by the instructor. The personalized management of the learning materials means the set of rules and mechanisms that are used to select learning materials based on the student’s characteristics, the educational objectives, the teaching model, and the available media. Many works have combined and integrated these three factors in e-learning systems, leading to several standardization projects. Some projects have focused on determining the standard architecture and format for learning environments, such as IEEE Learning Technology Systems Architecture (LTSC), Instructional Management Systems (IMS), and Sharable Content Object Reference Model (SCORM). IMS and SCORM define and deliver XML-based interoperable specifications for exchanging and sequencing learning contents, i.e., learning objects, among many heterogeneous e-learning systems. They mainly focus on the standardization of learning and teaching methods as well as on the modeling of how the systems manage interoperating educational data relevant to the educational process [5].

IMS and SCORM have announced their content packaging model and sequencing model, respectively. The key technologies behind these models are the content package, activity tree, learning activities, sequencing rules, and navigation model. Their sequencing models define a method for representing the intended behavior of an authored learning experience, and their navigation models describe how the learner- and system-initiated navigation events can be triggered and processed. Juan Quemada and Bernd Simon have also presented a model for educational activities and educational materials [6]. Their model for educational activities denotes educational events that identify the instructor(s) involved and take place in a virtual meeting according to a specific schedule. F. P. Rokou et al. described the introduction of stereotypes to the pedagogical design of educational systems and appropriate modifications of the existing package diagrams of UML (Unified Modeling Language) [6].

The IMS and SCORM models describe well the educational activities and system implementation, but not the educational contents knowledge in educational activities.

Juan Quemada’s and F. P. Rokou’s models add more pedagogical background by emphasizing educational contents and sequences using the taxonomy of learning resources and stereotypes of teaching models. But the educational contents and their sequencing in these models are dependent on the system and lack standardization and reusability. Thus, we believe that if an educational contents frame of learning resources can be introduced into an e-learning system, including ontology-based properties and hierarchical semantic associations, then this e-learning system will have the capabilities of providing adaptable and intelligent learning to learners.

The hierarchical contents structure is able to show the entire educational contents, the available sequence of learning, and the structure of the educational concepts, such as the related super- or sub-concepts in the learning contents. Furthermore, some of semantic relationships among the educational contents, such as ‘equivalent’, ‘inverse’, ‘similar’, ‘aggregate’ and ‘classified’, can provide important and useful information for the intelligent e-learning system.

Stojanovic et al. [10] describe an e-learning scenario based on the Semantic Web, in particular concentrating on ontologies for e-learning objects. This group is associated with the Learning Lab Lower Saxony, which itself is a partner in the Wallenberg Learning Network.

Naive et al. [9] describe an e-learning framework, again based on the Semantic Web, that discusses Semantic Web techniques and peer-to-peer services for the search, retrieval, publication, replication and mapping of metadata. This group is part of a consortium comprising Swedish and German universities developing a P2P network for the exchange of educational resources.

Fayed Ghaleb, Sameh Daoud, Ahmad Hasna, Jihad M. AlJa’am, Samir A. El-Seoud, and Hosam El-Sofany [11] proposed Semantic Web-Based model for our e-learning system. They presented an approach for developing a Semantic Web-based e-learning system, which focus on the RDF data model and OWL ontology language. They had demonstrated the effectiveness of this approach through several experiments using different type of courses taught in Qatar University. The facilities that the application will provide include allowing e-learning content to be created, annotated, shared and discussed, together with supplying resources such as lecture notes, course description, documents, announcements, student papers, useful URL links, exercises and quizzes for evaluation of the student knowledge.

In all of researcher’s models, they have not specified any conceptualization of a specific domain in terms of concepts, attributes, and relationships. They did not create any vocabulary or namespace for university using ontology that is very necessary to identify any university semantically. They created this ontology based model only for Qatar University.

For this purpose, ontology is introduced in our model. We also create a namespace “univ” to identify any university from around the world that is based on our proposed model. It can play a crucial role in enabling the representation, processing, sharing and reuse of knowledge among applications in modern Web-based e-learning systems because it specifies the conceptualization of a specific domain in terms of concepts, attributes, and relationships.

Moreover, the number of ontology-centered researches has increased dramatically because popular ontological languages are based on Web technology standards, such as XML and RDF(S),
so as to share and reuse it in any Web-based knowledge system [7, 8]. Thus, we have devised a model that provides the contents structure using an ontology for a adaptive and intelligent e-learning system.

Followings objectives are set to achieve our aims.

- Further analysis on Semantic web, E-LMS and development of namespace for University Domain.

III. DOMAIN and NAMESPACE

A. Domains:

An ontology is a formal representation of knowledge as a set of concepts within a domain, and the relationships between those concepts. [12]

Now this leads to the concept of domains. the domain of discourse, also called the universe of discourse (or simply universe), is the set of entities over which certain variables of interest in some formal treatment may range. The domain of discourse is usually identified in the preliminaries, so that there is no need in the further treatment to specify each time the range of the relevant variables.[13]

Another good definition is “A class containing all the entities referred to in a discourse or an argument. Also called universe.”[16]

For example, in an interpretation of first-order logic, the domain of discourse is the set of individuals that the quantifiers range over. In one interpretation, the domain of discourse could be the set of real numbers; in another interpretation, it could be the set of natural numbers. If no domain of discourse has been identified, a proposition such as \( \forall x (x^2 \neq 2) \) is ambiguous. If the domain of discourse is the set of real numbers, the proposition is false, with \( x = \sqrt{2} \) as counterexample; if the domain is the set of naturals, the proposition is true, since 2 is not the square of any natural number. [13]

In the concept of ontology, A domain ontology (or domain-specific ontology) models a specific domain, which represents part of the world. Particular meanings of terms applied to that domain are provided by domain ontology. For example the word card has many different meanings. An ontology about the domain of poker would model the "playing card" meaning of the word, while an ontology about the domain of computer hardware would model the "punched card" and "video card" meanings.

Another concept is the upper ontology. An upper ontology (or foundation ontology) is a model of the common objects that are generally applicable across a wide range of domain ontologies. It employs a core glossary that contains, the terms, and associated object descriptions, as they are used in various, relevant domain sets. There are several standardized upper ontologies available for use, including Dublin Core, GFO, OpenCyc/ResearchCyc, SUMO, and DOLCE. WordNet, while considered an upper ontology by some, is not strictly an ontology. However, it has been employed as a linguistic tool for learning domain ontologies. [12].

B. Namespace:

The attribute namespace provides the namespace of an ontology or similar vocabulary. It is encoded as a simple URL, As an additional service, [14]

Essentially, a namespace is a collection of terms that multiple people agree to share, and furthermore, they agree on specific meanings for those terms. The Web, as it turns out, provides a powerful way of sharing namespaces: we can plant them on websites and anyone who wants to use those terms knows where to find them, along with their meanings.

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One of the first namespaces to explode on the Web is called the Dublin Core. (Sorry, but the name refers not to the Dublin in Ireland, but to the Dublin in Ohio, where a group of people met to establish this namespace.) It is a collection of terms that can be used to describe resources that can be found on the Web, or in paper libraries, or in any other place where we store information.

These terms include Contributor, Date, Publisher, Subject, and many more.[17]

A vary popular namespace is FOAF. FOAF (from "friend of a friend") is an RDF based schema to describe persons and their social network in a semantic way. FOAF could get used within many wikis for annotating user pages, or describing articles about people. In Semantic MediaWiki, FOAF annotations can be used as imported vocabulary. [15]

IV. THE “univ” NAMESPACE

With the concept of name space we have gathered in previous chapters, and towards the goal of making an e-learning management system in semantic web, we now will create a name space called the univ name space.The semantic web is a web of data. A person or a program can be represented by either FOAF or BBC ontology. So we thought to make a name space that will able to provide the information about university in semantic web. We defines the univ name space as-“The name space and supported ontologies to visualize and supports the information of an university in semantic web.” Throughout the next chapters, we will develop the name space, test and validate it, and will discuss what we can do next with it.

A. Proposed Ontology for Univ namespace:

The following ontology is used for our proposed univ namespace. Here University is base class and it contains eight sub class are shown in figure.
B. Description Of proposed Univ Ontology:

Here relationship among several classes and objects are shown in figure. Figure-2 shows that a people may be student, teacher or stuff by indicating arrows from people to those class. Inversely every student, teacher or stuff must be a people are indicated by arrow towards People. The Research class also directed to people as researcher is a people.

C. Univ namespace specification

To Relationship among Student, Teacher, Stuff and People Objects implement the Univ name space by using the above ontology we use the following classes and properties.

Classes:
University, Courses, People, Programs, Research, School, Student, Staff, Teacher

Properties:
1) ObjectProperties: courseProgram, hasElement, isElementOf, schoolHasElement, isElementOfSchool, researchAuthor.
ii) **Data Properties:**
programDetails, schoolDetails, researchDetails, peopleDetails, courseDetails, name, address, city, country, about.

**Description of Classes:**

**Class: Univ#University**
- University - A university
- Status: Stable.
- Has Subclass: Courses, People, Programs, Research, School, Student, Stuff, Teacher
- Properties Include: name, address, city, country, about.

The University Class contains a collection of subclasses that represents a university system in ontological structure. For simplification only name properties are shown.

For example, here is a fragment of a University class:

```xml
<owl:Class rdf:about="http://www.pstu.ac.bd/ontology/univ#University">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="http://www.pstu.ac.bd/ontology/univ#name"/>
      <owl:someValuesFrom rdf:resource="&xsd;string"/>
    </owl:Restriction>
  </rdfs:subClassOf>
</owl:Class>
```

**Class: Univ#Programs**
- Courses - A collection of program (Like B. Sc. Engg(CSE, ECE)).
- Status: partially stable
- Has Subclasses: Program1
- Properties Include: hasprogram, programMustHave, courseProgram, programDetails.

**Class of: University**
The Programs class contains a collection of degree that a university provide.

For example, here is a fragment of the Programs class:

```xml
<owl:Class rdf:about="http://www.pstu.ac.bd/ontology/univ#Programs"/>
```

**Class: Univ#Courses**
- Courses - A collection of courses.
- Status: partially stable
- Has Subclasses: Course1
- Properties Include: hasCourses, coursesMustHave, courseProgram, courseDetails.

**Class: Univ#School**
- School - A collection of faculties.
- Status: stable
- Has Subclasses: school1
- Properties include: schoolHasElement, isElementOfSchool, schoolDetails.

The Courses class basically deals with the Courses, Research, Program class. For example, here is a fragment of the School class:

```xml
<owl:Class rdf:about="http://www.pstu.ac.bd/ontology/univ#School"/>
```

**Class: Univ#Research**
- Research - research document.
- Status: stable
- Has Subclasses: research1
Properties Include: hasResearch, researchMustHave, researchDetails, researchAuthor
Subclasses of: University

The Research class basically deals with the various researches under several schools and also connected with the People class via researchAuthor property.

Class: Univ# People
People – overall peoples of university.
Status: stable
Has Subclasses: people1, people2, people3, people4, people5
Properties Include: hasElement, peopleDetails.
Subclasses of: University

The People class basically deals with Student, Teacher, Stuff classes. It mainly contains all of the peoples those are connected with the University. For example, here is a fragment of the People class:

<owl:Class rdf:about="http://www.pstu.ac.bd/ontology/univ#People">
  <rdfs:subClassOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#University"/>
  <rdfs:subClassOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#univ#coursesMustHave"/>
  <rdfs:subClassOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#hasCourses"/>
  <rdfs:subClassOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#isElementOfSchool"/>
</owl:Class>

Class: Univ# Student
Student – student entity.
Status: stable
Has Subclasses: student1, student2, student3.
Properties Include: isElementOf, Subclasses of: University

The Student class is mainly connected with the People class.

Class: Univ# Teacher
Teacher – teacher entity.
Status: stable
Has Subclasses: teacher1, Teacher2, Teacher3.
Properties Include: isElementOf, Subclasses of: University

The Teacher class is mainly connected with the People class.

Class: Univ# Stuff
Stuff – stuff entity.

Status: stable
Has Subclasses: stuff1
Properties Include: isElementOf, Subclasses of: University

The Stuff class is mainly connected with the People class.

Description of Properties:

Property: univ# coursesMustHave
Status: stable
Domain: Courses
Range: School
Inverse Of: hasCourses
SubProperty Of: isElementOfSchool

The property coursesMustHave refers that each course is under a specific school class. For example, here is a fragment of the coursesMustHave property:

<owl:ObjectProperty rdf:about="http://www.pstu.ac.bd/ontology/univ#coursesMustHave">
  <rdfs:domain rdf:resource="http://www.pstu.ac.bd/ontology/univ#Courses"/>
  <rdfs:range rdf:resource="http://www.pstu.ac.bd/ontology/univ#School"/>
  <rdfs:inverseOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#hasCourses"/>
  <rdfs:subPropertyOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#isElementOfSchool"/>
</owl:ObjectProperty>

Property: univ# hasCourses
Status: stable
Domain: School
Range: Courses
Inverse Of: coursesMustHave
SubProperty Of: schoolHasElement

The property hasCourses refers that every school must have some specific courses. For example, here is a fragment of the hasCourses property:

<owl:ObjectProperty rdf:about="http://www.pstu.ac.bd/ontology/univ#hasCourses">
  <rdfs:range rdf:resource="http://www.pstu.ac.bd/ontology/univ#Courses"/>
  <rdfs:domain rdf:resource="http://www.pstu.ac.bd/ontology/univ#School"/>
  <rdfs:inverseOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#coursesMustHave"/>
  <rdfs:subPropertyOf rdf:resource="http://www.pstu.ac.bd/ontology/univ#schoolHasElement"/>
</owl:ObjectProperty>
The rest of the properties that are given above are also specified like the similar procedure. To implement the relation among several classes through the properties we also used the following Individuals.

**Individuals:**
About_course1, About_people1, About_People2, About_people3, About_people4, About_people5, About_program1, About_research1, About_school1, About_student1, About_student2, About_student3, About_staff1, About_teacher1.

V. TESTING THE univ NAMESPACE

As we already discuss the namespace in semantic web and define the univ namespace, the namespace for defining a university, next we are going to testing the namespace.

For testing, we will use the W3C RDF Validation Service [18]. This RDF validation service is based on Another RDF Parser (ARP). It currently uses version 2-alpha-1. ARP was created and is maintained by Jeremy Carroll at HP-Labs in Bristol.

This means that the service now supports the Last Call Working Draft specifications issued by the RDF Core Working Group, including datatypes. It no longer supports deprecated elements and attributes of the standard RDF Model and Syntax Specification and will issue warnings or errors when encountering them. See RDF Issue Tracking for more information. The service does not do any RDF Schema Specification validation.

This W3C service was created by Nokia's Art Barstow (a former W3C Team member). The internationalization was done by Martin Dürst. It was previously maintained by Emmanuel Pietriga (another former W3C Team member), who also implemented the IsaViz plug-in. It is currently maintained jointly by Eric Prud'hommeaux (eric@w3.org), Ryan Lee (ryanlee@w3.org) and Ted Guild (ted@w3.org). [19]

First, we have to develop an rdf file. That must include our univ namespace. We test the namespace in localhost. The following link we gave-

```xml
<xmlns:univ="http://localhost/ontology/univ.owl">
```

However, the true link will be,

```xml
<xmlns:univ="http://www.pstu.ac.bd/ontology/univ.owl">
```

We will consider our university (Patuakhali Science and Technology University) should be represented in web 3.0 by the namespace. However, we are not going to visualize the full university but some portion of it. Here is the detail we are going to use:

```xml
resource=http://www.pstu.ac.bd
name=Patuakhali Science and Technology University
address=Dumki, Patuakhali
city=Patuakhali
country=Bangladesh
about=The host University for univ namespace
```

**Programs:**
resource=http://www.pstu.ac.bd/faculties/cse.html
prName=Bsc in CSE
prClass=undergraduate

**Research:**
resource=http://www.pstu.ac.bd/ontology/univ
Publisher=resource:http://www.pstu.ac.bd
rTitle=The univ Namespace
rYear=2011
people=resource:http://faysalahmed.wordpress.org

**School:**
resource=http://www.pstu.ac.bd/faculties/cse.html
sName=Faculty of CSE
sLocation="http://www.pstu.ac.bd"

**Course:**
resource=http://www.pstu.ac.bd/faculties/cse.html
cName=Computer Fundamentals
cCode=CSE101
cSemester=1st

**People:**
resource=http://faysalahmed.wordpress.com
pName=Faysal Ahmed
pAddress=180/6/23/B East Rampura
pCountry=Bangladesh
pDesignation=student
pCity=Dhaka

We write the following rdf file for testing purpose which have the above definitions.

```xml
<?xml version="1.0"?>
<!-- -->
<!-- Demo file for univ namespace -->
<!-- Faysal Ahmed-->
<!--the header -->
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:univ="http://www.pstu.ac.bd/ontology/univ.owl#">
<!-- the university-->
<rdf:Description
rdf:about="http://www.pstu.ac.bd">
<univ:name>Patuakhali Science and Technology University</univ:name>
<univ:address>Dumki, Patuakhali</univ:address>
<univ:city>Patuakhali</univ:city>
<univ:country>Bangladesh</univ:country>
<univ:about>The host university for "univ" namespace</univ:about>
</rdf:Description>
<!-- Courses--> 
<rdf:Description
rdf:about="http://www.pstu.ac.bd/faculties/cse.html">
```
Result and Discussion

After validating the rdf file discussed in previous chapter, we found the following triples:

<table>
<thead>
<tr>
<th>Number</th>
<th>Subject</th>
<th>Predicate</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
<td><a href="http://localhost/ontology/univ.owl#name">http://localhost/ontology/univ.owl#name</a></td>
<td>&quot;Patuakhali Science and Technology University&quot;</td>
</tr>
<tr>
<td>2</td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
<td><a href="http://localhost/ontology/univ.owl#address">http://localhost/ontology/univ.owl#address</a></td>
<td>&quot;Dumki, Patuakhali&quot;</td>
</tr>
<tr>
<td>3</td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
<td><a href="http://localhost/ontology/univ.owl#city">http://localhost/ontology/univ.owl#city</a></td>
<td>&quot;Patuakhali&quot;</td>
</tr>
<tr>
<td>4</td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
<td><a href="http://localhost/ontology/univ.owl#country">http://localhost/ontology/univ.owl#country</a></td>
<td>&quot;Bangladesh&quot;</td>
</tr>
<tr>
<td>5</td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
<td><a href="http://localhost/ontology/univ.owl#about">http://localhost/ontology/univ.owl#about</a></td>
<td>&quot;The host university for &quot;univ&quot; namespace&quot;</td>
</tr>
<tr>
<td>6</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cName">http://localhost/ontology/univ.owl#cName</a></td>
<td>&quot;Computer Fundamentals&quot;</td>
</tr>
<tr>
<td>7</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cCode">http://localhost/ontology/univ.owl#cCode</a></td>
<td>&quot;CSE101&quot;</td>
</tr>
<tr>
<td>8</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cSemester">http://localhost/ontology/univ.owl#cSemester</a></td>
<td>&quot;1st&quot;</td>
</tr>
<tr>
<td>10</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cName">http://localhost/ontology/univ.owl#cName</a></td>
<td>&quot;Programming&quot;</td>
</tr>
<tr>
<td>11</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cCode">http://localhost/ontology/univ.owl#cCode</a></td>
<td>&quot;CSE102&quot;</td>
</tr>
<tr>
<td>12</td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/univ.owl#cSemester">http://localhost/ontology/univ.owl#cSemester</a></td>
<td>&quot;1st&quot;</td>
</tr>
<tr>
<td>14</td>
<td><a href="http://faysalahmed.wordpress.com">http://faysalahmed.wordpress.com</a></td>
<td><a href="http://localhost/ontology/univ.owl#pName">http://localhost/ontology/univ.owl#pName</a></td>
<td>&quot;Faysal Ahmed&quot;</td>
</tr>
</tbody>
</table>

We, as stated before, tested the rdf in the validator and find accurate result. The results are given in the Result and Discussion chapter.
<table>
<thead>
<tr>
<th>No.</th>
<th>Person/Role/Location</th>
<th>Uri</th>
<th>Triplet Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td></td>
<td><a href="http://faysalahmed.wordpress.com">http://faysalahmed.wordpress.com</a></td>
<td><a href="http://localhost/ontology/university:university#pDesignation">http://localhost/ontology/university:university#pDesignation</a></td>
<td>&quot;Student&quot;</td>
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<td><a href="http://faysalahmed.wordpress.com">http://faysalahmed.wordpress.com</a></td>
<td><a href="http://localhost/ontology/university:university#pCity">http://localhost/ontology/university:university#pCity</a></td>
<td>&quot;Dhaka&quot;</td>
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<td>21</td>
<td></td>
<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/university:university#prName">http://localhost/ontology/university:university#prName</a></td>
<td>&quot;BSc in Engg. (CSE)&quot;</td>
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<td><a href="http://localhost/ontology/university:university#prClass">http://localhost/ontology/university:university#prClass</a></td>
<td>&quot;Undergraduate&quot;</td>
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<td><a href="http://localhost/ontology/university#rTitle">http://localhost/ontology/university#rTitle</a></td>
<td>&quot;The univ Namespace&quot;</td>
</tr>
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<td></td>
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<td><a href="http://localhost/ontology/university#rYear">http://localhost/ontology/university#rYear</a></td>
<td>&quot;2011&quot;</td>
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<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/university#sName">http://localhost/ontology/university#sName</a></td>
<td>&quot;Faculty of CSE&quot;</td>
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<td>29</td>
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<td><a href="http://www.pstu.ac.bd/faculties/cse.html">http://www.pstu.ac.bd/faculties/cse.html</a></td>
<td><a href="http://localhost/ontology/university#sLocation">http://localhost/ontology/university#sLocation</a></td>
<td><a href="http://www.pstu.ac.bd">http://www.pstu.ac.bd</a></td>
</tr>
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</table>

Here, we are actually representing a very small representation of the Patuakhali Science and Technology University, a very fictional one. However it shows the possibility of the full visualization of this university as well as any university by the constraints of the given univ namespace. But it is also true that we are seeing a possibility of merging this rdf to the linked data by proper statements.
The main contribution of this paper is our new model and the “univ” namespace for E-learning Management system using Semantic web, using the Semantic Web technology in any universities. Our model including various services and tools in the context of a semantic portal, such as: course registration, uploading course documents and student assignments, interactive tutorial, announcements, useful links, assessment, simple semantic search and the namespace is used to visualize and supports the information of a university in semantic web.

In this paper there are two primary advantages; one is that the proposed model, which contains a hierarchical contents structure and semantic relationships between concepts, can provide related useful information for searching and sequencing learning resources in web-based e-learning systems and Second is creating namespace to represent an university on semantic web. We hope that this proposed model and this namespace will be very beneficial than other proposed model that we got from other research papers. It can help a developer or an instructor to develop a learning sequence plan by helping the instructor understand the why and how of the learning process. This proposed model and this namespace on universities will help to create E-learning management system using semantic web in any learning institutions.

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