

University of Science and Technology
College for Graduate Studies & Academic Advancement

Towards SCORM-Conformant Integrated Learning Management System

Instructor Module: view registered subject list, upload learning material, manage quiz and manage calendar

Integrated learning Management System

Instructor Module

A thesis submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Information System

Prepared By:

Sarah Siddig Mohammed Ali

Supervised By:

Dr. Azhari Gasmalla

November 2014

Abstract

In order to enhance and facilitate learning environments, E-learning systems have been used widely in educational domains. The research has been motivated by problems afflicting LMS (Learning Management System). The problems are the needed for integration and the needed for standardized LMS.

The research objective is to develop the following SCORM-conformant (Sharable Content Object Reference Model) instructor module's functions (View registered subject list, Upload learning martial, Manage quiz, Manage calendar) in an ILMS (Integrated Learning Management System) called LID (Learning Innovation Distinguish) system. The research developed instructor module's functions using a systematic approach of software development, that is, agile XP software development methodology.

As a result of the research the LID instructor module's functions (View registered subject list, Upload learning martial, Manage quiz, Manage calendar) has been successfully developed conformant with SCORM.

ملخص البحث

لتحسين و تسهيل بيئات التعليم، تم استخدام أنظمة التعليم الإلكتروني على نحو واسع في المجالات التعليمية. كان البحث مدفوع بالمشاكل التي تواجهه (Learning Management System) LMS. هذه المشاكل هي الحاجة للتكامل، و الحاجة لان يكون النظام قياسي.

إنّ الهدف من البحث تطوير وظائف وحدة الأستاذ (عرض المواد التي تم تخصيصها له، رفع المواد التعليمية، ادارة الاختبارات، ادارة التقويم) متوافقة مع مقياس (Sharable Content Object SCORM Reference Model) في نظام لادارة التعليم المتكامل يدعى (LID (Learning, Innovation, Distinguish). تم تطوير وظائف وحدة الأستاذ في البحث بإستعمال منهجية منظمة لتطوير البرامج تسمى Agile XP وهي علم منهجي لتطوير البرامج.

كنتيجة للبحث تم تطوير وظائف وحدة الأستاذ (عرض المواد التي تم تخصيصها له، رفع المواد التعليمية، ادارة الاختبارات، ادارة التقويم) بنجاح في نظام LID متوافقة مع المعيار S

1.1 Introduction

The chapter presents the motivations, the objectives, the methodology, the expected outcomes and the thesis organization.

1.2 Motivations

In order to enhance and facilitate learning environments, E-learning systems have been used widely in educational domains.

The LMS is the framework that handles all aspects and functions of the learning process, also it is the infrastructure that delivers and manages instructional content. The research has been motivated by problems afflicting learning management systems. This section illuminates the problems, and arguments put forward as to why such that research is required. As further instances behind this research are The needed for integration; functions (view registered subject list, upload learning martial, manage quiz, manage calendar) instructor's module, the needed for standardized e-learning; sharable contents by using SCORM (Sharable Content Object Reference Model) standard and the related Works in many learning management system supporting SCORM like Dokeas.

1.3 Objectives

The objective is to develop the following SCORM-conformant instructor module's functions (View registered subject list, Upload learning martial, Manage quiz, Manage calendar)

1.4 Methodology

The project uses Extreme Programming (XP) methodology, XP is the most widely used approach to agile software development which is intended to improve software quality and responsiveness to changing customer requirements, it

advocates frequent releases in short development cycles, which are intended to improve productivity and introduce checkpoints at which new customer requirements can be adopted (Roger, 2010).

1.4.1 Activities of XP

Extreme Programming uses an object oriented approach as its preferred development paradigm and encompasses a set of rules and practices that occur within the context of four framework activities: planning, design, coding, and testing (Roger, 2010).

1.4.1.1 Planning

The planning activity (also called the planning game) begins with listening- a requirements gathering activity that enables the technical members of the XP team to understand the business context for the software and to set a broad feel for required output and major features and functionality. Listening leads to the creation of a set of "stories" that describe required output, features, and functionality for software to be built (Roger, 2010).

1.4.1.2 Design

XP design rigorously follows the KIS (keep It Simple) principle. A simple design is always preferred over a more complex representation, in addition, the design provides implementation guidance for a story as it is written nothing less, nothing more.

If a difficult design problem is encountered as part of the design of a story, XP recommends the immediate creation of an operational prototype of that portion of the design called a spike solution; the design prototype is implemented and

evaluated. The intent is to lower risk when true implementation starts and to validate the original estimates for the story containing the design problem.

XP encourages Refactoring, which is the process of changing a software system in such a way that it does not alter the external behaviour of the code yet improves the internal structure. It is a disciplined way to clean up code and modify, simplify the internal design that minimizes the chances of introducing bugs, in essence, when you refactor you are improving the design of the code after it has been written (Roger, 2010).

1.4.1.3 Coding

After stories are developed and preliminary design work is done, the team does not move to code, but rather develops a series of unit tests that will exercise. Once the unit test has been created, the developer is better able to focus on what must be implemented to pass the test. Nothing extraneous is added (KIS). Once the code is complete; it can be unit-tested immediately, thereby providing instantaneous feedback to the developers.

A key concept during the coding activity (and one of the most talked about aspects of XP) is pair programming. XP recommends that two people work together at one computer workstation to create code for a story, this provides mechanism for real-time problem solving (two heads are often better than one) and real-time quality assurance (the code is reviewed as it is created). As pair programmers complete their work, the code they develop is integrated with the work of others (Roger, 2010).

1.4.1.4 Testing

We have already noted that the creation of unit tests before coding commences is a key element of the XP approach. The unit tests that are created should be implemented using a framework that enables them to be automated; hence, they can be executed easily and repeatedly. This encourages a regression testing strategy whenever code is modified (which is often, given the XP refactoring philosophy).

As the individual unit tests are organized into a universal testing suite integration and validation testing of the system can occur on a daily basis. This provides the XP team with a continual indication of progress and also can raise warning flags early if things go awry. Fixing small problems every few hours takes less time than fixing huge problems just before the deadline; this is known as XP acceptance tests (Roger, 2010).

1.5 The research expected outcomes

Develop the following SCORM-conformant instructor module's functions (view registered subject list, upload learning material, manage quiz, manage calendar).

1.6 The Thesis Organization

Chapter 2 is background that presents definition and some related works.

Chapter 3 is development phase that presents the planning, designing, coding and testing of specific functions.

Chapter 4 is Conclusion that presents result summary and research recommendations.