Development of a Computer-Aided ODL Course Development Tracking System (CDTS)

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Abstract

Constant emphasis and close attention paid to Quality Assurance in the production of Open Distance Learning (ODL) course materials at Wawasan Open University (WOU) had necessitated that the whole process of course materials development be clearly defined and tracked systematically. Although a Standard Operating Procedure already exists, yet its implementation by way of manual tracking could not always guarantee that the work delivery timelines are diligently tracked and crucial inputs from all key stakeholders in the course development team are received in a timely manner. There was also a need to ensure that Schools and their academics (course coordinators), the Registry, Educational Technology and Publishing Unit, IT Services and Learning and Library Services could track the developmental stages of any named course at any specific time.

A new software application had been developed in-house at WOU which enables all the key stakeholders to keep track of all stages of the course development chain from start to end. The application, built on the Microsoft .NET framework using a centralized MS SQL Server database, serves as a central repository of all the information relevant to the course development cycle and manages the archiving of all the documents. The application can generate (i) course development status reports for ongoing development, (ii) the complete course development report for the courses which have been completed and (iii) summary reports of the progress of any on-going or completed course development for management purposes by the Deans and Directors of the relevant academic support units.

A pilot study was conducted involving participation of a small group of selected key stakeholders. It provided valuable feedback which had helped the software development team to further fine-tune the application before the system gets deployed in July 2010.

This paper describes the development process and the workings of the Course Development Tracking System (CDTS). It discusses the implications of implementing the system in a real-world environment.

***Keywords**: Course Development, Open Distance Learning (ODL), Tracking of Course Development, Course Development Team*

Introduction

The core business of Wawasan Open University (WOU) is Open Distance Learning (ODL). The students of WOU are mainly adult learners who pursue Degree and Masters Programs in disciplines such as computer science, electronics, business management, administration, education, languages, psychology and courses under liberal studies. The courses are delivered based on a blended approach which includes self-directed learning materials provided on CDs and prescribed textbooks, supplemented by a *Moodle*-based Learning Management System called *WawasanLearn.*

The development of every course in WOU is the responsibility of an appointed course development team (CDT) which comprises: (i) Course Team Leader (CTL), (ii) Course Coordinator (CC), (iii) Course Writer(s) (CW), (iv) Academic Member (AM), (v) Instructional Designer(s) (ID), (vi) Editor, (vii) External Course Assessor (ECA), (viii) Graphics Designer(s) (GD), (ix) Representative from Learning and Library Services (LLS); and (x) Representative from Information Technology Services (ITS). An "Interdisciplinary Team Model" [1] is adopted to ensure that the quality of the course materials as well as instructional design meet the standards required by the Malaysian Qualifications Agency (MQA, 2010).

The complete course development cycle, starting from the formulation of the Course Blueprint (CBP) and ending with the published course material, follows a very rigorous QA-related standard operating procedure (WOU, 2010). Full development of a course may take up to 18 months, and during this period meetings of the CDT are held at various stages, generating a series of interim reports and documents. The whole course development cycle as practiced in WOU is depicted in Figure 1.
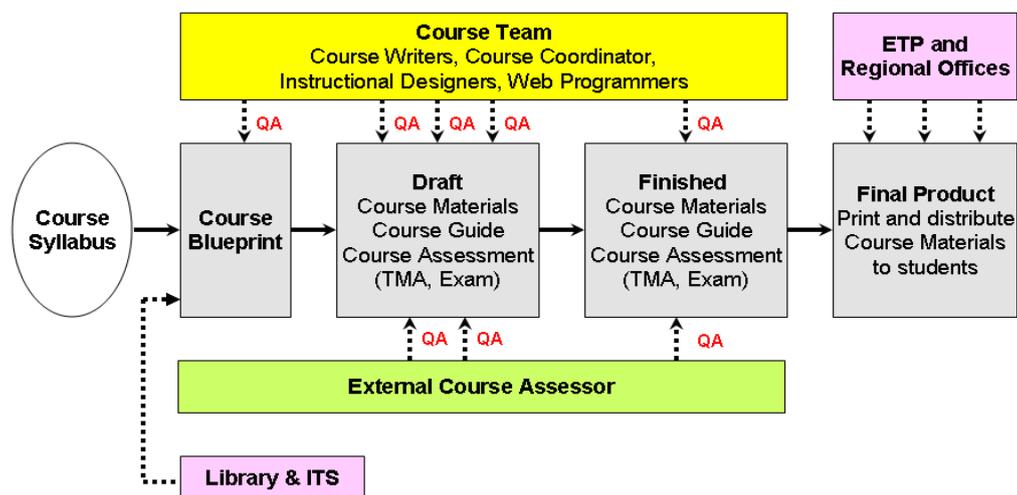

Figure 1: Complete Course Development Flowchart at WOU

As the whole course development process is executed over an extended period of time, generally over two semesters involving stakeholders from within and outside the university, it was rather difficult to manually monitor progress, update records and ensure that delivery deadlines are met. The whole process also necessitates the writing of many interim reports and documents, which entails the storing, naming, versioning and sharing of these documents in a systematic manner.

In order to overcome the above-mentioned difficulties and also to ensure that all stakeholders from the relevant Schools and members of the CDTs adhere to the standard operating procedure (SOP) diligently, the idea of using Tele-informatics (Hache, 2000) by developing dedicated software to track the whole course development process was thus conceptualized and developed. This software application, called the "*Course Development Tracking System (CDTS)*", enables all the academics, academic heads, instructional designers and relevant management staff to keep track of the complete course development process from start to finish from their respective work places. CDTS also serves as a central repository of all the information relevant to the course development cycle, including those generated by the software. The application can generate all the interim reports and documents automatically, thus lightening the burden on the CDT.

Development of the Course Development Tracking System (CDTS)

After exploring various software applications and content management systems currently available in the market, it was found that none of the existing solutions could cater to the needs of WOU as expressed above. To ensure that the complete course development scenario is captured in the CDTS, an in-house team was assembled, which included software developers as well as academics and instructional designers. The team charted the step by step pathway of the course development cycle and divided the whole process into four distinctive components or phases, namely (i) Blueprint Write-up, (ii) Course Unit Write-up, (iii) Editing; and (iv) Approval.
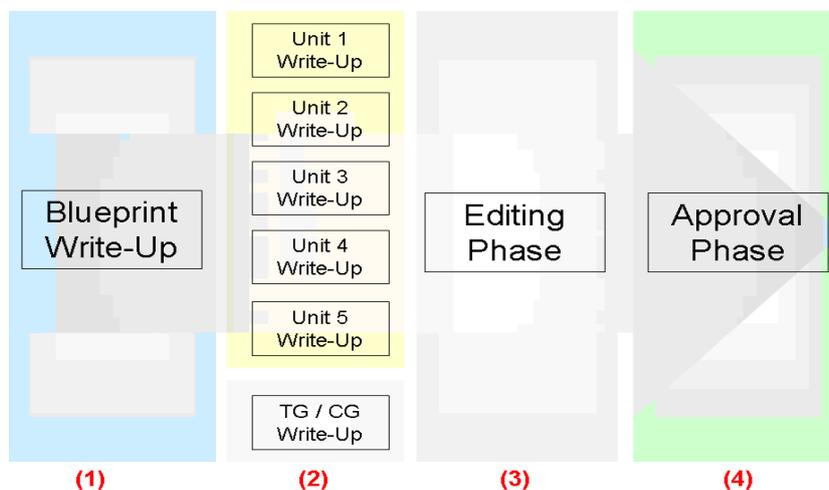

Figure 2: The four main phases of the course development process

Once the distinctive phases were identified, the activity flow in each component was explained to the software development team which then designed the required system.

CDTS Architecture

System Architecture

The CDTS system was designed as a two-tier application with (i) a Windows-based client application which is installed on the user's PC; and (ii) backend database and storage servers. The client application connects to the database server and the document storage server through the WOU Local Area Network (LAN), authenticated by the Active Directory (AD) account of that user. The document storage server also doubles as the update server where newer versions of the software are stored for distribution. The client application periodically checks for newer versions and automatically downloads the latest version to the client PC. An offsite Disaster Recovery (DR) server acts as the backup server for the database as well as the documents. Backups are scheduled daily and are executed automatically to capture full backups of the documents as well as the database.
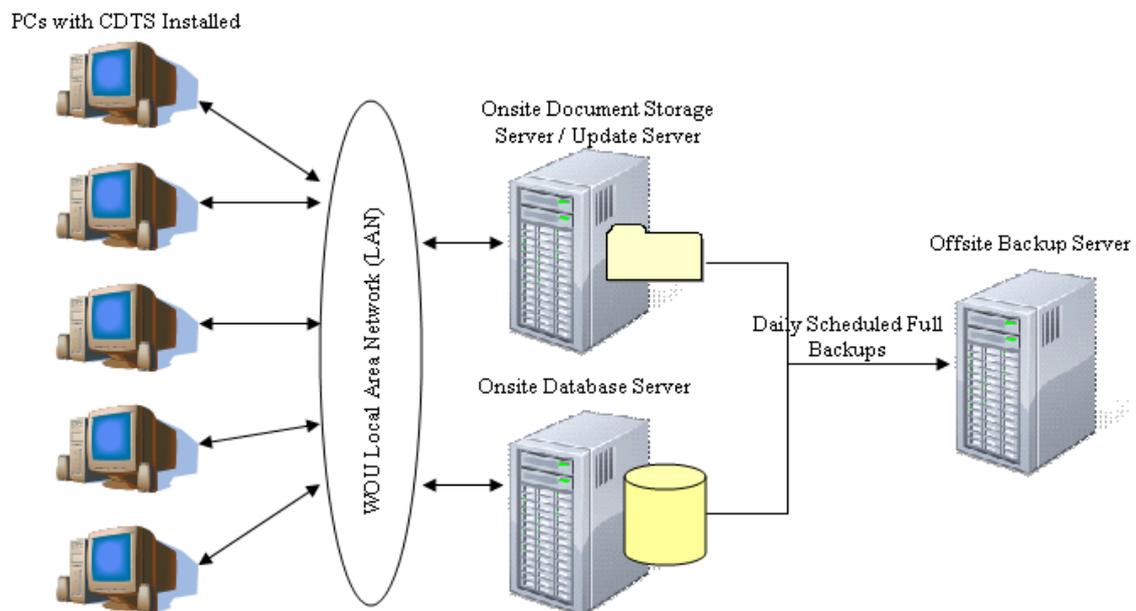
Figure 3: **CDTS system architecture**

Technology Platforms

The client application was written using Microsoft Visual Basic 2005 and .Net framework 2.0. The database server is Microsoft SQL Server 2005. The server operating system is Microsoft Windows Server 2003.

Features of CDTS

The key features of the CDTS are summarized as shown in **Table 1.**

Table 1: Key features of CDTS

	Feature	Description
01	**Master Dashboard**	Provides a quick summary of the course, current status and CDT.
02	**Schedule**	Manages the content delivery schedule and deadlines.
03	**Meetings**	Manages and stores CDT meeting minutes. The minutes can be e-mailed directly to the CDT via the system.
04	**Course Details**	Maintains textbook, assessment, tutorial and lab details.
05	**CDT Details**	Maintains all the CDT details. This provides quick access to contact info for the CDT.
06	**Comments**	Manages the comments made by the CDT. These comments will be automatically used by the system for generating reports.
07	**Progress Update**	Tracks each stage of the course development process. Any relevant documents (e.g. draft of Unit 1) can also be uploaded to the system as records using this feature.
08	**Progress Chart**	A graphical representation of the course development progress in each stage of the SOP.
09	**Documents**	Manages all the documents uploaded and generated. This feature automatically creates folder structures on the server, manages versioning and enforces access control for sharing.
10	**Reports**	Generates all the interim and final reports.
13	**User Database**	Manages the users and privileges.
14	**Help**	Manages the helpdesk for the system.

The frontend user interface of the CDTS is shown in **Figure 4**
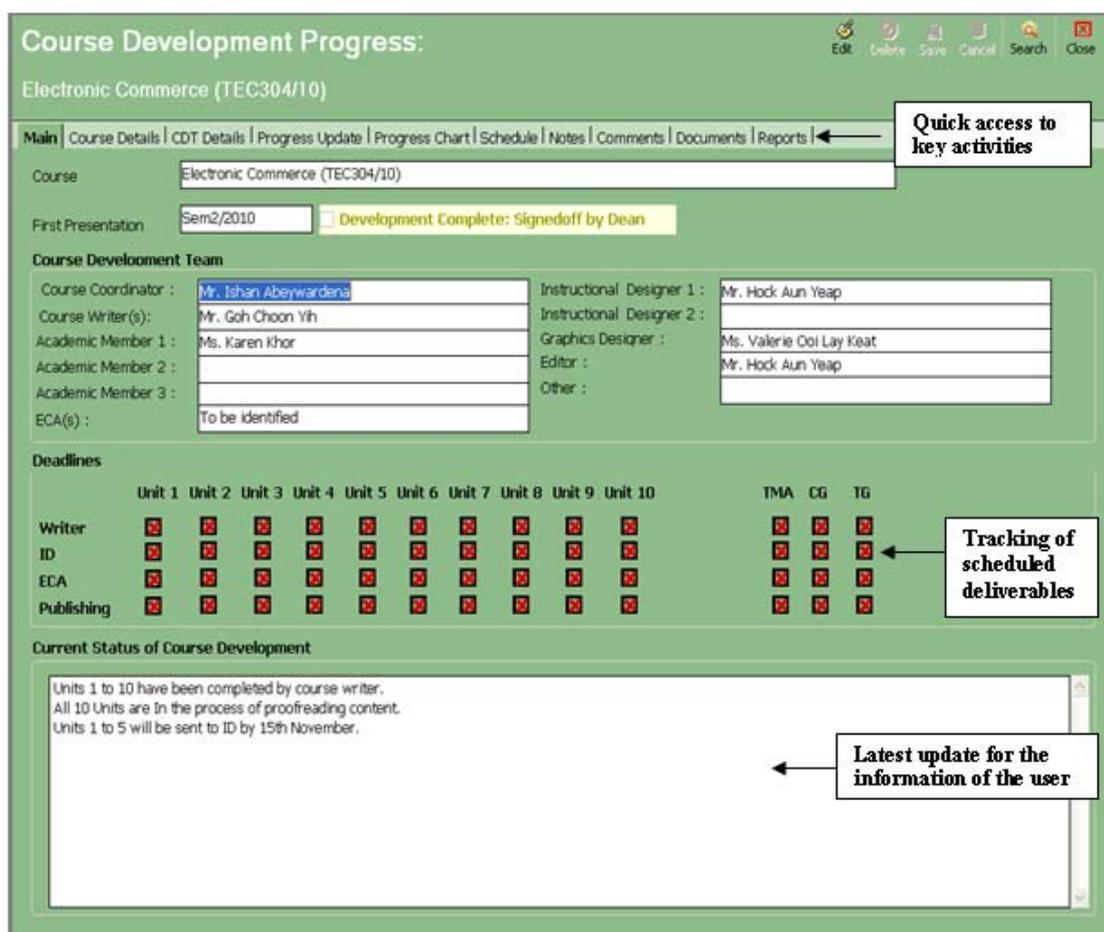
Figure 4: Frontend user interface of CDTS

Testing and Training

A pilot testing of the beta version of the CDTS was carried out by a group of 20 participants (ultimate users) representing the four Schools, Educational Technology and Publishing Unit, IT Services Unit, Learning and Library Services Unit and the Registry. A formal user training session on the use of CDTS was eventually carried out for all the key stakeholders in a face-to-face workshop session.

Some additional requirements were identified during the pilot study and the user training sessions which include:

- The necessary protocols for system installation;
- Technical limitations of the system with respect to use and implementation;
- Technical and infrastructure requirements for the deployment of the system.

The above have since been addressed.

Advantages of using CDTS

To the end user in WOU, the key advantages of using CDTS for tracking of course development include:

- Having easy access to course information and CDT information;
- Being able to keep track of deadlines and scheduled deliverables throughout the developmental phases of the course;
- Efficiently compile and share notes, comments and feedback received from the CDT;
- Track the progress of the course development against the SOP and schedule;
- Manage and archive all the related documents for easy access including meeting minutes of all the interim CDT meetings;
- Generate all the interim reports guided by the system;
- Access the system from your own workplace.

Implementation

In practice, the system will be populated with master data by the Administrative Executives of the relevant Schools and supporting departments. The CDTS system will be deployed for use in tracking all new courses of WOU. All key stakeholders including Deans and department heads will have access to the system.

Conclusion

A software application called the "Course Development Tracking System (CDTS)" has been developed in-house in WOU out of the dire need to enable all stakeholders and members of the course development team (CDT) to keep track of the complete course development process from start to finish. The CDTS also serves as a central repository of all the information relevant to the development of a particular course as it manages the archiving of all the working documents. The application can generate all the necessary interim reports and documents automatically, thus reducing the work load of members of the CDT.

The client application was written using Microsoft Visual Basic 2005 and .Net framework 2.0. The database server is Microsoft SQL Server 2005. The server operating system is Microsoft Windows Server 2003.

The next move is to enhance the CDTS to turn it into a web-enabled system which can be securely accessed by authorized users via the WOU staff portal.

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