BACKGROUND

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ABSTRACT
This paper presents literature synthesis for the SHAWCO K2 center project. A number of papers were looked at where similar tools were used to set up a LMS. Papers that evaluated the use of Moodle and Drupal from the installation to customisation where studied for this document. Other papers that conducted a comparison of some of the popular LMS were also viewed in order to discover which LMS was the correct tool to choose. Papers that looked at the use of Bookmarks and the organisation of bookmarks as well as why bookmarks are used were also looked at since a bookmark feature is part of the project. Moodle was chosen as the appropriate LMS to be used and a Bookmark and Attendance Register feature will be added to Moodle to meet the needs of the K2 center.

Categories and Subject Descriptors

General Terms

Keywords
Keywords are your own designated keywords.

1. INTRODUCTION
Learning Management Systems (LMS) have been gaining popularity all over the world. They are especially useful when it comes to distant learning. There are a large number of LMS on the market and some of these products are open source while others are proprietary. They all come with a list full of features and it is up to the consumer to decide which they think will benefit their organisation. The following document will define the problem being faced at the SHAWCO K2 center. We will then cover the related work for the LMS, Bookmark and Attendance Register feature that comprise the solution being proposed for the K2 Centre. Then we will conclude the document with the analysis of the tools chosen.

2. PROBLEM DEFINITION
The University of Cape Town (UCT) Students' Health and Welfare Centers Organisation (SHAWCO) set up the K2 Center at Khayelitsha to give the students in Khayelitsha an opportunity in acquiring essential skills in Information Technology. With funding from sponsors like Microsoft and the National Lottery the K2 IT Center was built and fitted with 30 networked computers and they have recently been provided with an Internet connection. The purpose of the center was to provide the youth of Khayelitsha with the useful skills to use Information and Communication Technology (ICT). The center teaches grades 8 basic computer skills, such as how to use Windows packages (word, excel, etc). There are 5 sessions a week (Monday – Friday), each session running for 2 hours (14H30 – 16H30) [1].

Currently even through the computers are networked; the network is not being effectively used, since some of the computers are not connected to the other. Some of there other problems that we observed at the center are as follows:

- The students have no user accounts so they have to log on to the same computer each week;
- The students do not have a place where they can save their work except in folders where anyone can access them;
- The students have more than one tutor and they normally lose their place in the work material, so they end up wasting time explaining to tutors what work was covered with different tutors;
- There is also an issue with tutors and students not showing up when they are supposed too.

All the problems discussed above can be properly addressed with the use of a LMS.

3. RELATED WORK
A LMS is a perfect solution to resolve the problems discussed above. There are currently a large number of popular LMS which are used in most universities and organisations to deal with users and the organisation of their own personal content. Moodle, Drupal, Vula (Sakai project) and Blackboard are a few of these LMS which could be used. For this project we focused on open source packages, which do not require a lot of computing power and could meet most of the features required at the K2 Center. Most LMS require a database such as MySQL, a web server such as Apache, a script language like PHP and a computer with a static IP address [4].

3.1 Learning Management Systems
3.1.1 **Moodle**

Moodle is an Open Source LMS that was developed by Martin Dougaimas, then a PhD candidate in Education with a background in computer science in 1999. The first version of Moodle was released in August 2002 [9].

A single Moodle web site can host a large number of courses and students. Each course has support for teachers, tutors and students. One or more teachers can manage a course in Moodle and have control over what content is displayed on the course site and the number of registered students and tutors.

The tutors in the course can view the work submitted by the students and grade the work and post the results for the students to view. The tutors can also have access to the forums. The students in the course site have access to login accounts and can submit their work on Moodle and view their grades. They can also

view their submitted work as well as the content that the teachers make available to them.

Graf and List [8] compare a group of Open Source LMS in an attempt to find out which was the most adaptive, Moodle and Sakai were amongst the list of LMS that were compared. At the end of the study it was found that Moodle dominated the evaluation by achieving the best results in five categories and the best rating in the adaptation category. The strength of Moodle from the paper was the realization of communication tools, and the creation and administration of learning objects [8].

Chavran and Pavri [10] conducted a study on Moodle. They looked at the installation and configuration, administration and the customization of the product. The results that we found from this study was that Moodle runs on the widest variety of platforms, its easy to install and modify, it is modular to allow growth and it can be used in conjunction with other systems and it is well documented.

3.1.2. **Drupal**

Drupal was developed in 2000 by Dries Buytaert and some of his friends who wanted to build a small news site with built in web board. The board would allow Dries and his friends to leave each other notes and announcements. It was only in 2001 that the software was released. Drupal is said to be modular and extensible, demands low resources and is easy to use [3].

Simpson [7] wanted to move from a paper based "to-do" list to a neatly printed list on a computer. The solution for this was a Content Management System (CMS). The author wanted to experiment with different techniques in developing a CMS, they looked at varies options, from building the LMS form scratch to comparing Open Source package Drupal and Mambo. The final result was that the author leant how to use the different tools in developing a CMS such as the database and server. From the comparison of Drupal and Mambo, the author states that working with a pre built package was better since it can be extended from what others have already done. Between Drupal and Mambo the author found using Drupal was better than using Mambo even though they could both facilitate the tasks the author had in mind [7].

Sawhney and Mund [13] had previous experience with using Drupal to build successful websites and they share what they have learnt when they migrated the Planetizen website to drupal. This allowed them to cut down on development time, add features which they needed and benefit from the advantages that came with open source software. Drupal was selected because of its user management, access control, work flow, separation of content, web based editing and administration features. In the paper the authors explain how they customized Drupal to fit what they needed from selecting the module they wanted to use, configuring drupal, user roles and permissions, taxonomy and finally choosing the themes.

3.1.3 **Vula (Sakai project)**

Vula is a Sakaiproject initiative at UCT of an online LMS. Sakai is the consortium of universities from around the world started to discuss and share teaching and learning methodologies with the common goal to improve higher learning. The Sakai LMS was selected at UCT because of the strength of the consortium, the solid architecture, proven scalability and sustainability [5].

The core features that come with Sakai are announcements, drop box, resources, chat room, forums, and message of the day and message center and many more. The sakai community continue to develop new tools for the project, to keep up with advancements in IT technology some of the future tools that will be included in the coming Sakai installations are shared display, multi-point audio, pod-casting and more [5].

3.1.4 **Blackboard (WebCT)**

Blackboards mission is to enable educational innovations everywhere by connecting people with technology. Their role is to improve the educational experience with Internet-enabled technology that connects students, faculty, researchers and the community in a growing network of education environments dedicated to better communication and content [4].

The products from Blackboard are proprietary. The LMS offers most of the features we have come to expect from most LMS. It offers chat rooms and forums for the users, central repository of resources, online submissions and online quizzes. WebCT which is a product from Blackboard is mainly used in the statistic department at UCT.

The following table shows the features that Blackboard, Sakai and Moodle support for more detail visit [6].

Product Name	**The Blackboard Academic Suite**	**Sakai 2.3**	**Moodle 1.8**
Developer Name	**BlackBoard**	**Sakai 2.3**	**Moodlerooms**
Communication Tools			
Discussion Forums	Supported	Supported	Supported
File Exchange	Supported	Supported	Supported
Online Journal/Notes	Supported	Supported	Not supported
Real time Chat	Supported	Supported	Supported
Productivity Tools			
Bookmarks	Supported	Supported	Not supported
Calender/Progress Reviews	Supported	Supported	Supported
Searching within course	Supported	Supported	Supported
Work offline/Synchronisation	Supported	Supported	
Orientation helper	Supported	Supported	Supported
Student Involvement Tools			
Group work	Supported	Supported	Supported
Community Networking	Supported	Supported	Supported
Student Portfolios	Supported	Supported	Supported
Administration Tools			
Authentication	Supported	Supported	Supported
Course Authorization	Supported	Supported	Supported
Registration Integration	Supported	Supported	Supported
Course Delivery Tools			
Different Test types	Supported	Supported	Supported
Automated testing Management	Supported	Supported	Supported
Automated testing Support	Supported	Supported	Supported
Online Marking Tools	Supported	Supported	Supported
Online Gradebook	Supported	Supported	Supported
Student Tracking	Supported	Supported	Supported
Content Development Tools			
Content Sharing/Reuse	Supported	Supported	Supported
Course Templates	Supported	Supported	Supported
Customised Look n Feel	Supported	Supported	Supported
Instructional Design tools	Supported	Supported	Supported
Hardware/Software			
Client Browser Required	Some	Some	All
Database Requirements	Oracle, MySQL and MS SQL server	Oracle and MySQL	Oracle, MySQL, MS SQL server and PostGreSQL
Unix Server	Supported	Supported	Supported
Windows Server	Supported	Supported	Supported

3.2 Bookmark

A Bookmark is usually associated with book tag used to mark a person's place in a hard cover book or in technology terms it is used to help people remember and retrieve interesting websites they might still want to view. In [10] a study was conducted to determine how people organise their bookmarks and the reasons why people keep bookmarks. During the course of the study the

researchers found that the reason may people use bookmarks is because they are easy to make and they provide quick access to key sites (information). Researchers also found that some users used bookmarks to check when they last visited a site by checking when it was bookmarked. This means that bookmarks can be used by users to understand the history of their web browsing [10].

The bookmark feature that we are proposing for the project is not to store websites but the idea is the same as that of storing a tag to keep ones place in a book. Since the students at the K2 center have a work book of tutorials that they go through for the year, with the proposed feature they will be able to continuously store their place at all times within the work book.

3.3 Roster

The final issue to be resolved is that SHAWCO IT is a dynamic organisation with volunteers coming and going all the time. There are times when people do not show up when they are supposed to and the solution that we are proposing for this issue is that of an electronic Attendance Register system that will be added into Moodle. The Attendance Register will contain information on the volunteers and the student(s). Since 1 student may have more than 1 tutor on each day they attend the electronic bookmark will help with both identifying who attends on a regular basis and who does not. The Attendance Register will also be available in printable version for the administrators' of the IT center.

4. ANALYSIS

The LMS that we have chosen to use for this project is Moodle. Moodle is the most relevant LMS as it is well documented and there is a lot of support from the Moodle community and it has been used in the Computer Science department before. Where Moodle was compared with other LMS it came ahead of all the other LMS by getting the best scores in most categories compared to the other LMS's [8]. WebCT will not be used for this project since it is proprietary and the organisation would need to pay for the package and we are proposing a cheap solution. Drupal is not appropriate for this project since it is used more to building successful websites and blogging tools or web based forum software [14]. Vula is not appropriate because it requires a lot of computing resources which could result in the systems at the center running slow.

The bookmark feature is a feature that will be integrated into Moodle, and it will allow the students and the tutors to retrieve the information quickly and they will not have to spend a lot of time trying to find out what work was covered previously with the other tutors.

The Attendance Register feature is also another feature that will be integrated into Moodle as well, so when the students logon the SHAWCO administrators will know which students are usually late and which usually do not show up so they can find out the reasons. The Attendance Register will also be used for the volunteers since at the end of the project they receive certificates and some people still get certificates even if they did not attend, but with the Attendance Register system there will be a trail of how often everyone attended.

5. CONCLUSION

This paper looked at similar projects that used LMS as a tool to facilitate a need of providing content to a large group of people. Projects that compared different LMS were looked at so that the right decision could be made when selecting a LMS and Moodle was selected as the correct LMS to use for the K2 center project. Other papers that looked at how Bookmarks are used were also viewed in order learn and understand why people use bookmarks, since they will be included in this project as well. Another feature that will be included in this project is that of an Attendance Register which will be added as a new tool into Moodle.

6. ACKNOWLEDGMENTS

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7. REFERENCES

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