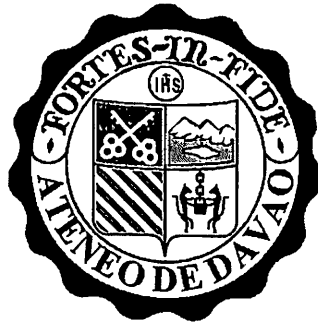


**DESIGN AND IMPLEMENTATION OF A RESEARCH
REPOSITORY WEB SERVICE USING
CLOUD COMPUTING**



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REPOSITORY WEB SERVICE USING
CLOUD COMPUTING**

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TABLE OF CONTENTS

ABSTRACT.....	5
CHAPTER 1	6
INTRODUCTION	6
1.1 Background of the Study	6
1.2 Technology Application Context	7
1.3 Objectives of the Study	8
1.4 Significance of the Study	9
1.5 Scope and Limitations of the Study.....	9
1.6 Definition of Terms	10
CHAPTER 2	13
REVIEW OF RELATED LITERATURE AND WORKS.....	13
2.1 Ateneo de Davao Library Online Public Access Catalog (OPAC).....	13
2.2 Curtin University Thesis Collection	14
2.3 University of Wollongong Thesis Collection.....	14
2.4 Herdin NeON.....	15
2.5 University of the Philippines Integrated Library System	15
2.6 Summary of Related Literature and Works	16
CHAPTER 3	18
PROJECT DESIGN AND METHODOLOGY	18
3.1 Operational Framework.....	18
3.2 Methodology	20
3.2.1 Requirement / Gathering Phase	21
3.2.2 Architecture and Design.....	21
3.2.3 Development	22
3.2.4 Test and Feedback	23
CHAPTER 4	24
TECHNOLOGY BACKGROUND.....	24
4.1 Cloud Computing.....	24
4.2 Software-as-a-Service	25
4.3 Apache Tomcat.....	26
4.4 JavaServer Pages	27
4.5 MySQL.....	28
CHAPTER 5	29
RESULTS AND DISCUSSION	29
5.1 Requirement / Gathering Phase	29
5.2 Architecture and Design.....	30
5.3 Development	32
5.3.1 Creation of a University	32
5.3.2 Connection Management.....	35
5.3.3 Searching Process.....	39
5.3.4 Database Connection	43
5.3.5 Deploying the System in a Cloud Environment	43
5.4 Test and Feedback	52

CONCLUSION AND RECOMMENDATIONS	53
6.1 Conclusion	53
6.2 Recommendations	54
BIBLIOGRAPHY	55
APPENDIX A.....	58
USER GUIDE.....	58
APPENDIX B	76
RELEVANT SOURCE CODES.....	76
APPENDIX C	87
USER ACCEPTANCE TEST.....	87

ABSTRACT

The primary purpose of the study is designing and implementing a research repository web service using cloud-computing technology. Apache Tomcat was used for this project to enable the implementation of Java Servlets and JavaServer Pages (JSP). The study implements a Software-as-a-Service (SaaS), which allows users to run existing online applications from remote locations. Java™ Enterprise Edition 6 was used in developing the repository system. It is an implementation of a research repository web service that allows different institutions to share all researches of their authors to other institutions. A search functionality was also integrated to the system to enable the users to browse the available researches. The relevant information, which includes the abstract and recommendations about a particular research work are available in the system. The system also provides an author directory subsystem that contains the authors' information of all research works. Fifteen random Computer Studies students in Ateneo de Davao University were selected in conducting the User Acceptance Test to evaluate the overall performance of the system particularly its searching functionality.

Keywords:

cloud computing, apache tomcat, javaserver pages, java servlets, java enterprise edition, software as a service

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Nowadays, students find it hard to look for thesis topics. Though the Internet offers a huge amount of information that could help the students find a good topic, still they cannot verify immediately whether or not the topic has already been done or not. As a result, students keep on changing their topics. Since finding a thesis topic is the most crucial step, it is very important that students can be able to have an idea on what topics were already done so that they may either improve or research on it further.

Currently, the Computer Studies Division of the Ateneo de Davao University does not have any application that can help students provide an online listing of all the previous thesis works of its students. There is a need to come up with a research repository web service wherein any institutions can create and manage their research works. In this way, it will enable students to browse through all the research works that were already implemented in any institutions, if applicable. Also, the availability of the abstract and the recommendations is needed to help students understand the topic further. In addition, an author directory subsystem was included in the system to manage the information of the authors.

1.2 Technology Application Context

The research repository web service was designed to be readily used and deployed in a cloud environment. The system was implemented as a Software-as-a-Service type of cloud computing. Cloud computing is a technology that makes use of the internet and central remote servers in maintaining data and applications. It allows users to use applications without installation and access files at any computer with internet connection. It allows efficient computing by centralizing storage, memory, and processing of data. Software-as-a-Service (SaaS) is a software distribution model in which applications are hosted by a service provider that can be accessed over a network, typically the internet. SaaS is run within a web browser, which means users only need a compatible browser to access the application. It provides convenience in maintaining the application for multiple users. For example, if a remote software is updated, the client interface is also updated for all users.

The following were the tools used for designing and implementing a research repository web service:

Java Enterprise Edition 6 was the platform used for building the research repository system. A Web Profile is a specific profile type of Java EE 6 for developing lightweight typical web applications. Another profile is the Java EE 6 standard implementation for large-scale enterprise and distributed web application.

MySQL was used as the back-end tool of the system. MySQL is an open source relational database management system (RDBMS) that relies on SQL for processing the data in a database. It is commonly used for web applications. MySQL is known for its reliability and high performance.

Apache Tomcat was used as the web server of the system. It is a web container that allows the implementation of Java Servlets and JavaServer Pages. Apache Tomcat supports numerous large-scale, mission-critical web applications among diverse range of industries and organizations.

JavaServer Pages technology was used to create the dynamic web content of the system. It is responsible for controlling the content or appearance of the web pages. JSPs are similar to HTML pages that can contain a mixture of HTML tags, data, and Java code.

The research repository web service was developed from scratch. This is a system, which has many instances running at the same time in a web browser. The system can be used and deployed by any institutions to serve as their research repository system.

1.3 Objectives of the Study

The general objective of this research is to design and implement a research repository web service that uses Java™ Enterprise Edition and cloud computing.

The specific objectives are:

- Utilize cloud computing in creating a research repository web service to manage and collect information about research works.
- Implement a repository system that will allow institutions to share all the research works of their authors to other institutions.
- Integrate an author directory subsystem that manages the authors' information of all research works.

1.4 Significance of the Study

The research repository web service allows the creation and management of library of research works of any institutions. Any institutions can readily use and deploy the system as their research repository that can be accessed over the internet. The repository system also aims to make it easier for students to find a research topic since a list of already done research works is now available. In addition, since it is possible for more institutions to be involved, students are able to consider many research topics that can even help them have a better idea of what they really like to pursue. Furthermore, an author directory subsystem was also made available for reference.

1.5 Scope and Limitations of the Study

The study generally focuses on designing and implementing a research repository web service deployed in a cloud environment that allows its users to search or browse through different research works of authors from different institutions. The institutions can create and manage their own library of research works. Users can use the system by logging into the credentials provided by the institutions. An institution can send a request to another institution to view its research works. An institution can decide if it will allow its research works to be accessed by other institutions.

The research repository web service is applicable for any type of research works. However, in implementing the prototype the research works gathered by the proponents were limited to the field of Information Technology. The research works are categorized according to subject areas or accepted sub-fields of the study using the ACM Computing Classification System. It is a subject classification system for computer science devised

by the Association for Computing Machinery. We only used the top level categorization of ACM Computing Classification System.

The information gathered from a research work were the abstract and recommendations. The search functionality of the repository system uses only the title, keywords, abstract, authors, and the category of a research work in the searching process. A link to authors' profiles containing the authors' information was also made available in the system.

1.6 Definition of Terms

ACM Computing Classification System

ACM Computing Classification System is a classification system for computer science devised by the Association for Computing Machinery used to organize subjects by area.

Apache Tomcat

Apache Tomcat is an open source servlet container developed by the Apache Software Foundation (ASF), which enables the implementation of Java Servlet and JavaServer Pages (JSP).

Cloud Computing

Cloud Computing is a model where software applications or computer processing power are accessed from the Internet or a cloud of online resources.

Eclipse IDE

Eclipse IDE is a well known multi-language software development environment comprising an integrated development environment (IDE).

Java™ Enterprise Edition 6

Java™ Enterprise Edition 6 is a widely used platform for server programming in the Java programming language.

JavaServer Page (JSP)

JavaServer Page is a Java technology in creating dynamic content of web pages based on HTML, XML, or other document types.

MySQL (My Sequel or Structured Query Language)

MySQL is a relational database management system (RDBMS) that allows multiple users to access a number of databases.

Prototype

Prototype is a design pattern that will be used for testing and debugging.

Research

A methodical investigation into a subject in order to discover facts, to establish or revise a theory, or to develop a plan of action based on the facts discovered.

Servlets

Servlets are Java application programming interface (API) that runs on a server machine, which processes requests made by the client and generates responses.

Software-as-a-Service (SaaS)

Software-as-a-Service (SaaS) is sometimes referred to as "software on demand," a software that is deployed over the Internet rather than being installed on a local computing device.

Web Server

Web Server is the software or the computer application that helps to deliver content that can be accessed through the Internet.