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Student Advising and Retention (SAR) Application in Cloud Computing Environment

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Abstract

There exist a number of cloud computing vendors that provide user-friendly cloud computing programs and Information Technology (IT) services to various organizations, industries, and educational institutions. Cloud computing has become a very important and integral part of IT infrastructure in many organizations due to budget constraints. One of the cloud computing-based tools known as Gradesfirst has been involved in providing services to a number of universities for the purposes of student learning, online education, and assessments. The Athletic Department of UMES is currently using Gradesfirst for the academic advisement of student athletes. This paper proposes a new user-friendly application enhancing and expanding the current advising services of Gradesfirst currently being used for advising and retention by the Athletic department of UMES with a view to implement new performance activities like mentoring, tutoring, scheduling, and study hall hours into existing tools. This application includes various measurements that can be used to monitor and improve the performance of the students in the Athletic Department of UMES by monitoring students' weekly study hall hours, and tutoring schedules. It also supervises tutors' login and logout activities in order to monitor their effectiveness, supervises tutor-tutee interaction, and stores and analyzes the overall academic progress of each student. A dedicated server for providing services will be developed at the local site. The paper has been implemented in three steps. The first step involves the creation of an independent cloud computing environment that provides resources such as database creation, query-based statistical data, performance measures activities, and automated support of performance measures such as advising, mentoring, monitoring and tutoring. The second step involves the creation of an application known as Student Advising and Retention (SAR) application in a cloud computing environment. This application has been designed to be a comprehensive database management system which contains relevant data regarding student academic development that supports various strategic advising and monitoring of students. The third step involves the creation of a systematic advising chart and frameworks which help advisors. The paper shows ways of creating the most appropriate advising technique based on the student's academic needs. The proposed application runs in a Windows-based system. As stated above, the proposed application is expected to enhance and expand the current advising service of Gradesfirst tool. A brief demonstration of the proposed application will highlight the main features of the existing tool (Gradefirst).

Keywords:

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Introduction

Significance of Academic Advising and Retention

Most educational institutions are experiencing financial difficulties as a result of retention problems. Furthermore, retention issues affect universities' operations, logistical planning, space acquisition, and funds from state and federal government (Pargett, 2011). Students who drop out of school could have limited work opportunities than what they originally wanted (Pietras, 2010). Students who transfer to other schools from their original schools may have hard time integrating to a new environment causing a lasting impact on graduation time and academic performance (Pietras, 2010). Most students who suffered from poor retention might end up telling other students about the overall academic experience of a particular institution which in turn will influence academic performance and retention of students. Thus, retention efforts are very important to maintain recruitment of students. There exists a relationship between attrition, retention, and recruitment.

With the advent of technological advancement, the educational world is going through transformation chiefly because of the ways traditional education methods are facing major competitions with internet education or preferably the media. Access to information is on the rise and some are beginning to consider higher education outdated and irrelevant. Could the internet also be the solution to poor academic retention programs?

This paper explores cloud computing as an alternative, relevant, and cost effective platform to measure the effectiveness of the services offered by an academic retention canter and the participating students in educational institution. This paper aims to promote cloud computing as a convenient internet utility which could facilitate academic eligibility and actualization for academic retention. In order to understand the relevance of academic advising in academic retention, studies were conducted to explore other educational models used (Pietras, 2010).

The Impact of Cloud Technology on Advising and Retention

It is impossible to ignore other technological innovations in regards to cloud computing in respect to retention. Other developed work on this area has been done by well-meaning individuals and corporations. For the purposes of this research, two such works will be studied: Accutrack and Gradesfirst. They have been used at universities and institutions across the United States solely for academic retention purposes. Sadly, Accutrack and Gradesfirst application have constraints; Accutrack is database software basically focused on tutor log information, tutee log information, staff employment information, track loan material, query visitors demographic and charts. Accutrack runs on the limited storage space of the computer hardware in order to perform its service and fully focuses on the tutoring and tutee information. This program is obviously limited as it excludes student study hall hours report, advisor schedules and student grades.

On the other hand, Gradesfirst is more comprehensive and efficient because it runs on the cloud – although it also has its limitations. Gradesfirst is designed to meet advisor's needs more than the tutors' needs; the application is more tilted towards advising reports, assigned student, advisor work schedule, and grades. It excludes the logbook of tutors and tutees which Accutrack creates. This application has its own limitation since the effectiveness of retention programs cannot be fully measured comprehensively. Both the Accutrack and Gradesfirst application share common shortcomings in respect to integrating the interactions of basic academic retention elements which involves advising, tutoring, and students' grades.

Currently, UMES is using Gradesfirst in the Department of Athletics and it contains certain limitation and constraints such as lack of tutoring information, inadequate retention services and difficulties in accessing study hall data. In this paper we propose a user friendly application with unlimited storage, and a more integrated form of academic retention services including tutoring and other advising features. It allows the interaction of tutors, advisors, and students within a more comprehensive platform which operates on the cloud environment. This will foster a good communicative system among student retention services such as mentoring and tutoring, advising and participating students. With this fully utilized, academic retention will easily be attainable. As a result, the application will store student information and various performance indices of students.

Literature Review

Advising and Retention

In recent times, university dropout rates have been on the rise. Most universities suffer from poor academic retention of students and can hardly fill their classrooms (Pargett, 2011). This has

become a major issue confronting educational institutions; the urge to create a boundary between ethics and leniency is on an upsurge as universities find means of providing interventions to combat academic failures. One of the most critical factors influencing student retention rates is the effectiveness of academic advising (Pargett, 2011). Research shows that a student consistently meeting with faculty advisors improves retention (Gerdes & Mallinkrodt, 1994; Grites, 1998; McArthur, 2005; Pargett, 2011; Pietras, 2010). Hence, students who do not have consistent contact and access to academic advisors are less likely to finish college and earn a degree in the allotted period of time (Carlozo, 2012). Without the proper guidance, students may find it difficult to cope with the high demand of college courses and the increased burden when combined with family and work responsibilities (Carlozo, 2012). Since retention rates are so dependent upon the availability and quality of academic advising, it is imperative that universities provide adequate advisement opportunities to every student.

There is a significant relationship between student development and student academic satisfaction, which is very important to academic retention in schools. Studies were conducted to explore works done by five other prolific authors who developed illustrative retention models to solve retention issues in educational institutions (Pietras, 2010). These retention models include Spady's Dropout Process, Tinto's Student Integration Model, Bean's Student Attrition Model, and Pascarella's Conceptual Model for Research on Student-Faculty Informal Contact (Pietras, 2010, p. 61).

Studies have shown that there are two types of advising, namely prescription and developmental advising. In the Prescription Advising method, the advisor advises students based on what needs to be done to graduate (Pargett, 2011). This method has a major setback because it does not allow the student to make their own educational decisions. Developmental advising is a type of advising that involves the cooperation between the student and advisor in the decision making process with the aim of ensuring that the student graduates on time. Pargett quotes Hale, Graham, and Johnson saying that developmental advising stimulates and supports students in their quest for an enriched quality of life and it focuses on identifying and accomplishing life goals" (2009).

The quality and style of advising an advisor employs is a strong indicator of the type of relationship the advisor has with the student. The advisor is considered the middle-man between the institution and the student. The advisor is also the feedback mechanism to the educational policy-making board and retention program consultant. A mid-South university conducted a study in which 429 students were surveyed to ascertain their preferred style of advising. 78% of all students were currently receiving developmental advising. However, 95.5% of students surveyed preferred developmental advising to prescription advising (Hale, Graham, & Johnson, 2009).

Proposed Student Advising and Retention Application

The paper proposes a new application for advising and retention based on a cloud computing environment. The paper aims to explain the relevance of advising to academic retention of students. With the use of Visual Paradigm, a use case diagram and an activity diagram are designed in Unified Modelling Language (UML) to explain how the Student Advising and Retention application could be utilized. This is being done to explain the dynamics of the application's operation. This paper also focuses on the comparison of different advising styles and the adoption of the most effective method of advising in regard to student development.

This application is designed to create a system which monitors closely students' personal study patterns and grade performance and provide data for analysis and staff performance. It bridges Gradesfirst application with appropriate combination of functions and eliminates unnecessary features. Therefore, it enhances the capabilities of Gradefirst to include various performance activities like tutoring, study hall hours, and advisors' working hours. Some frameworks have been designed to help the User/Advisor use the application and depict the operational effectiveness of the Student Advising and Retention application. These frameworks include illustrative diagrams such as a use case diagram, an activity model, a retention model, and a developmental advising model. The implementation of the proposed application is based around a cloud computing environment. The proposed application will use the following frameworks for implementation.

Advising Framework

The proposed advising model designed during the course of the paper will help facilitate a good style of advising. It focuses on the use of developmental advising instead of prescription advising. This model evaluates a student's academic performance and diagnoses factors that might contribute to poor academic performance as well as providing solutions. The model allows a steady interaction between the advisor and the student using a developmental advising approach. It enhances the styles of

advising and equips the advisor with relevant information, detailed in the Student Advising and Retention application inger Publishing Co; 2002.

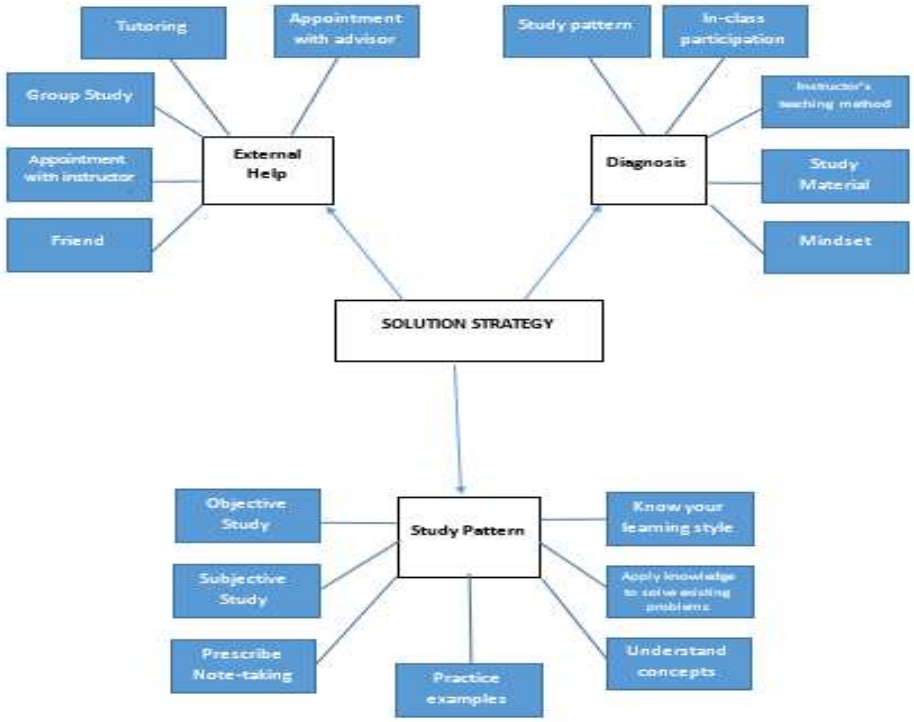


Figure 1. New Advising Framework

Retention Framework

The new retention framework is designed to combat the limitations of already existing models done by well-known authors and illustrate the impact of advising in academic retention. This model suggests that the advisor has a very critical role to play in academic retention in educational institutions. It places the advisor as a middle-man and a feedback mechanism of educational institutions. This model explores factors that contribute to academic success which includes the school environment as well as contact between the institution and advisors.

Interaction between the educational institution and the student is crucial. The model focuses on three role players who play a critical role in academic retention: the student, advisor, and instructor. By using the Student Advising and Retention application, students will be able to interact successfully with institutional retention programs such as tutoring, mentoring, guidance counselling, and study hall, as well as contact instructors and advisors. This will allow for a higher rate of retention, decrease attrition, and increase recruitment.

The role of the advisor is to act as a middle-man, employ the use of the SAR application, and foster interaction between the instructor and the student as well as play a critical role in academic policies or educational institutional policy-making. The framework recognizes the advisor as distinct educational personnel, unlike other schools and faculties which allow instructors to also act as advisors.

The proposed retention framework is unique from other retention models due to the fact that it places the advisor as the central Figure 1-2 in the retention process (Pietras, 2010). In this proposed framework, the advisor plays a pivotal role in student decision-making – whether to drop out, transfer, or to remain in college. Advisors act as middle-men, providing valuable feedback between the instructors, students, and institutional policymakers. The model recognizes the advisor as distinct educational personnel, unlike other schools and faculties which allow instructors to also act as advisors. Based on this proposed retention framework, the Student Advising and Retention application is developed in a cloud environment in order to foster academic retention and enhance the advising process.

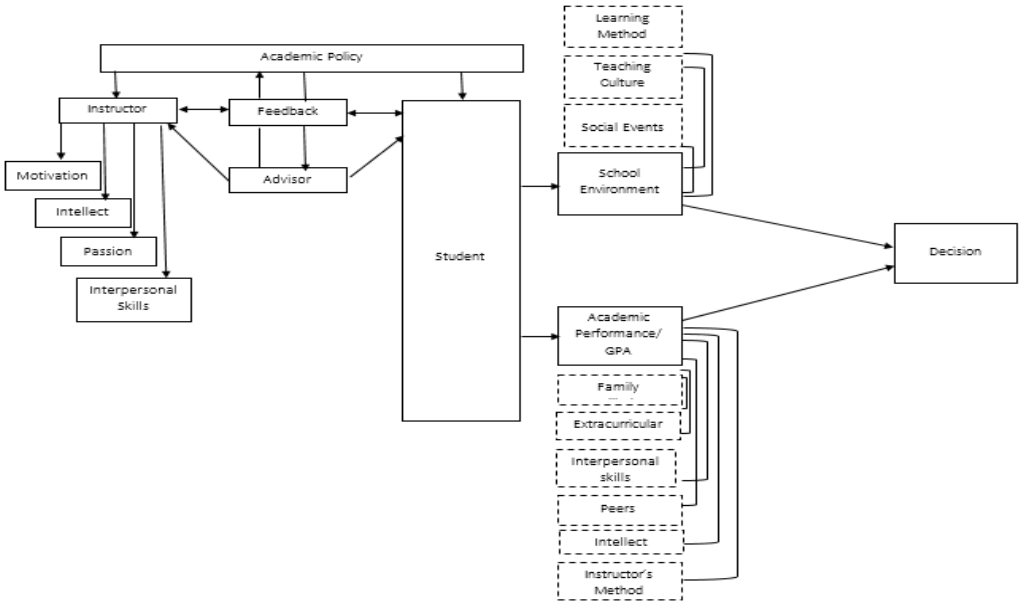


Figure 2. New Retention Framework

Design and Implementation of Student Advising and Retention Application (SAR)

Student Advising and Retention Application (SAR)

The paper focuses on the use of concept of cloud computing in academic advising for educational institutions. It is comprised of HTML programming functionality that focuses on assisting academic advisors to help students succeed academically. Thus, the paper creates a system that allows academic advisors to monitor the interaction between students' study hall participation and grades and tutoring involvements. It also monitors the performance of tutors and other advisors in order to allow excellent student retention and eligibility. The paper provides an accurate measure of the academic retention services offered by the school in reference to academic performance. This application is fully web based and straightforward. It provides information that allows for analysis and good data management. The features include study hall reports, tutor availability, tutee attendance, and advisors' work schedules. Thus, the objective of this paper is to enlighten and educate the intellectual mind on the conceptualization, definition, and application of cloud computing in academic advising.

One of the objectives of this paper is to create a Student Advising and Retention (SAR) cloud computing environment at a local site for utilization of the Athletic Department of the University of Maryland Eastern Shore. This application can be customized and tailored to fit the need of any interested department. The application includes various performance measures such as advising, tutoring, mentoring scheduling, and objective-based study hall hour. These measures can be used to determine the performance of students of the department. The paper explains how various strategies could be used by advisors and instructors to monitor and improve the performance measures.

Student's information stored in the database could be easily accessed by the assigned personnel. This information could aid data analysis, survey, and research on the effectiveness of monitoring student participation on academic retention programs like tutoring, advising, in class participation, and grade point average (GPA). The difficulties college academic advisors encounter when advising are due to the limited information regarding each particular student. There are some factors that affect a student's development and retention, such as teaching methods of instructors, study patterns, learning methods, in-class participation, peer tutoring, and extra-curricular activities. Academic advising plays a huge role in the retention of students. With the right style of advising, retaining students will be more easily attainable.

In order to undertake this paper, a systematic approach of coding and modelling will be utilized. The paper focuses on how to interface html and programming language for example Java script with HTML to create a cloud-based application and then host it on the internet. This setup could be so beneficial to institution which makes use of private cloud or hybrid cloud. The storage of information

especially IT related and other form of educational papers could be done through the cloud given the right method of initializations. This research focuses on the possibilities of acquiring cloud computing services, as well as recent findings on cloud computing. It is therefore imperative that we provide users with the room for improvement. Furthermore, this research shows different methods that can be explored and provides materials to help developers tailor their application in the most customized form.

Implementation of Proposed Student Advising and Retention Application

The step-by-step procedure of developing the Student Advising and Retention application is detailed (Figure 3).

Methodology:

1. Highlight User requirement, use case diagrams and activity Diagram with Unified Modelling Language(UML)
2. Set the Right Conditions of setting up a Cloud set up using HTML as a platform
3. Install Notepad++ ,and Sublime
4. Create Web-based application (Student Retention and Advising) with HTML code in Sublime and edit in Notepad++
5. Embed password and login name in Hypertext Preprocessor (PHP)
6. Use PHP, a server scripting language, to make interactive webpages
7. Use Cascading Style Sheet (CSS) for multiple web page layout
8. Test run the application from the computer as local host.

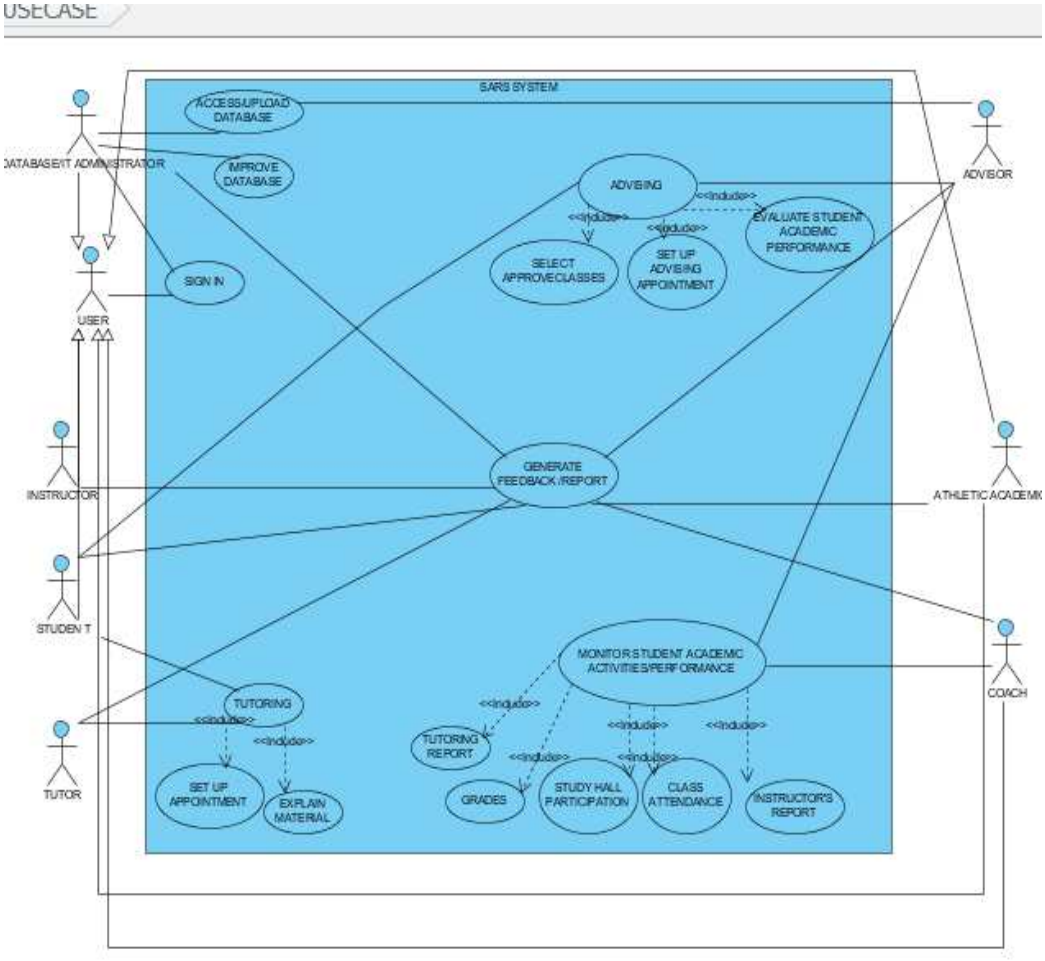


Figure 3. Use Case Diagram

The activity diagram portrays the flow of action in the usage of the Student academic advising and retention application. It is designed in UML using Visual Paradigm.

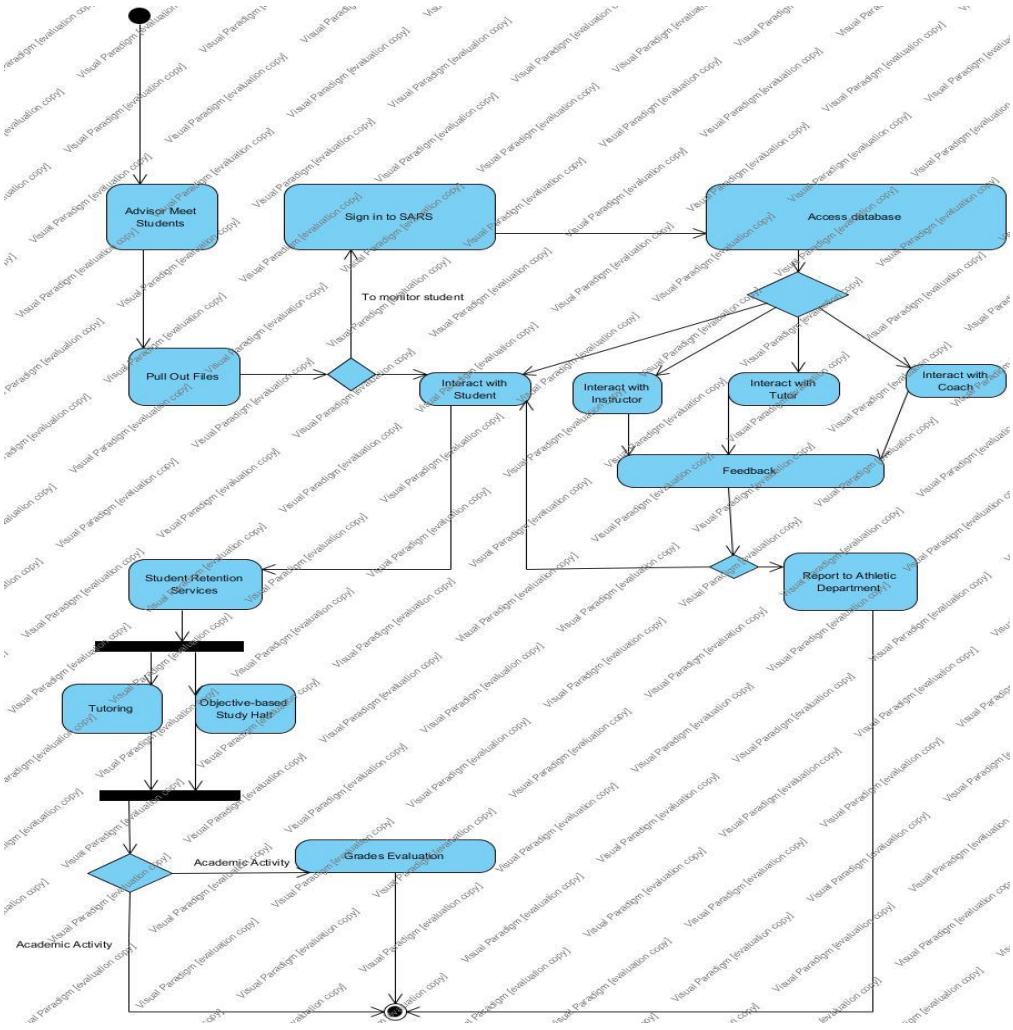


Figure 4. Activity Diagram

User Case Requirements

As shown in Figure 4, the Student Academic and Retention application is developed to broaden the institution's ability to describe student/staff/faculty activities.

1. ADVISOR:
   a. Access/upload database
   b. Advise students
   c. Select and approve classes, set up appointments, evaluate student performance
   d. Monitor student academic activity/performance
   e. Tutoring reports, grades, study hall participation, class attendance, instructors' reports
   f. Send feedback reports to student, instructor, tutor, athletic department, and coach
2. STUDENT:

Advising

   a. Set up appointments with advisor to select and approve classes, have performance evaluated

Tutoring

   b. Set up appointments with tutor, learn material

   Send feedback reports to advisor, instructor, tutor, athletic department, and coach
3. INSTRUCTOR:
   a. Teach student
   b. Send feedback reports to student, advisor, tutor, athletic department, and coach

4. COACH:
    a. Monitor student academic activity/performance:
    b. Tutoring reports, grades, study hall participation, class attendance, instructors' reports
    c. Send feedback reports to student, advisor, tutor, athletic department, and instructor
5. ATHLETIC DEPARTMENT:
    a. Send feedback reports to student, advisor, tutor, coach, and instructor
6. TUTORS:
    a. Set up appointments with student
    b. Explain material
7. DATABASE/IT ADMINISTRATOR:
    a. Access/upload database of student data and tutoring data
    b. Improve database
    c. Send feedback reports to student, advisor, tutor, athletic department, coach, and instructor

SAR Application Demonstration

Front Page **(Figure 5)**

1. Visit the local website: http://ofejirocloudservice.freetzi.com/login3.html
2. Sign up or log in.

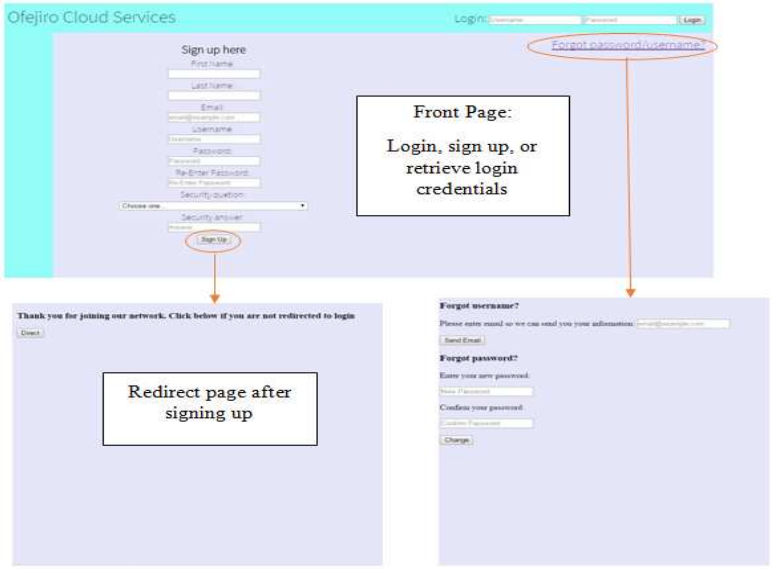


Figure 5. Ofejiro Cloud Services Front Page

Home Page **(Figure 6)**

In order to use the system users are required to access the homepage at SAR via http://ofejirocloudservice.freetzi.com/login3.html.

1. Choose a file from the hard drive to upload.
2. Click "Upload files" to upload the chosen file and view previously uploaded files.

The following snapshots will demonstrate what happen when these options are selected.

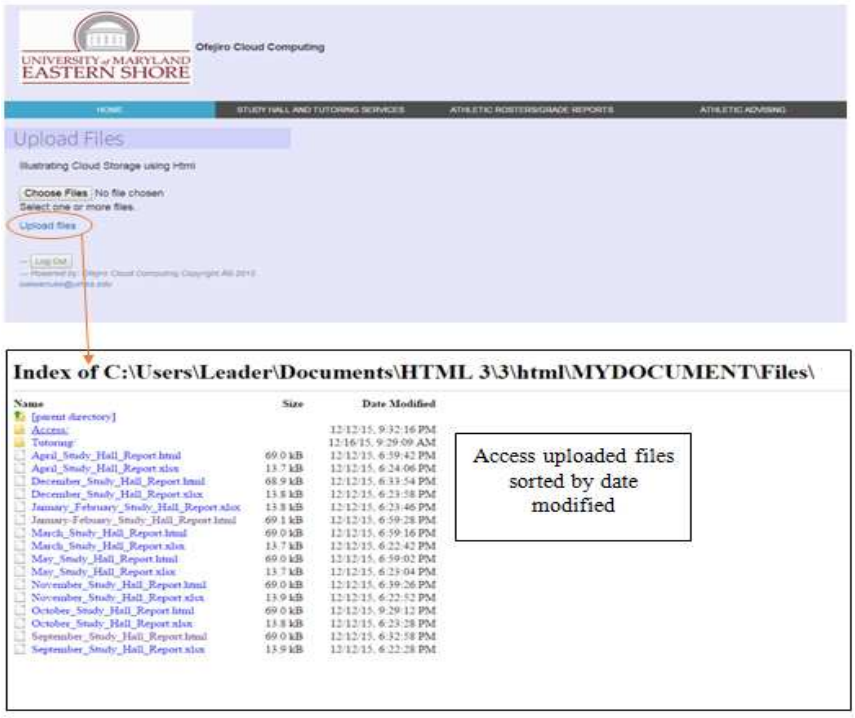


Figure 6. Home Page, upload screen

Athletic Study Hall Reports **(Figure 7)**

1. Click the second tab, titled "Study Hall and Tutoring Services."
2. Click "Select Month" underneath a semester heading.
3. Select study hall report by semester then by month in order to view or download the file.
4. View the study hall report using Microsoft Excel.

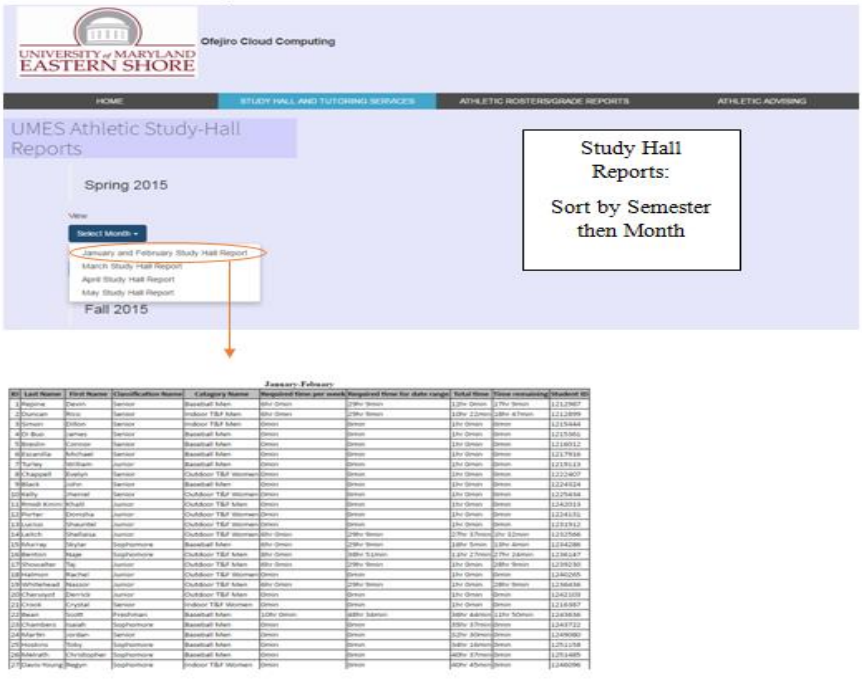
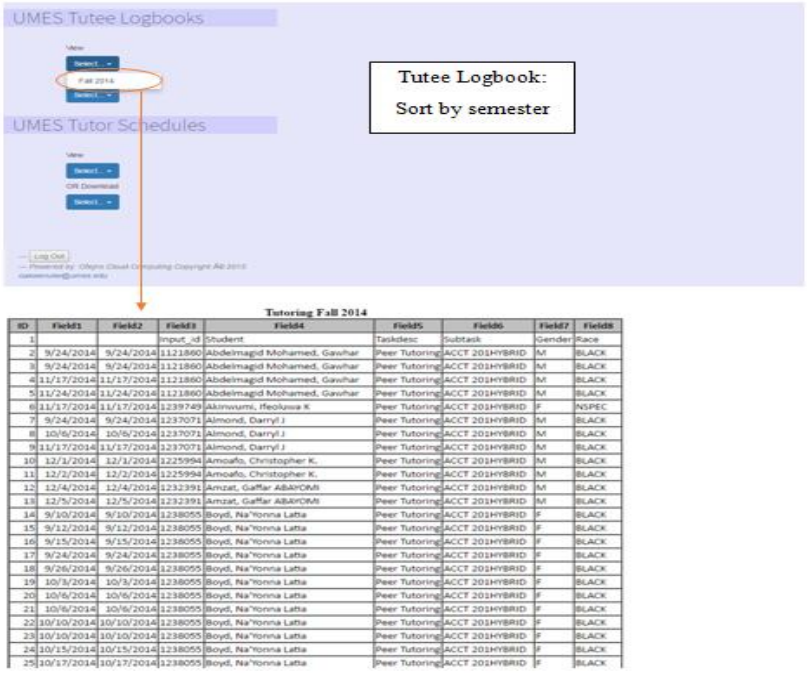


Figure 7. Study Hall and Tutoring Services, sort by date

Tutee Logbooks **(Figure 8)**

1. While under the "Study Hall and Tutoring Services" tab, scroll down to the Tutee Logbooks section.
2. View or download tutee logbooks by semester in Microsoft Excel.



ID	Field1	Field2	Field3	Field4	Field5	Field6	Field7	Field8
1			Input_id	Student	Taskdesc	Subtask	Gender	Race
2	9/24/2014	9/24/2014	1121860	Abdelmagid Mohamed, Gawhar	Peer Tutoring	ACCT 201HYBRID	M	BLACK
3	9/24/2014	9/24/2014	1121860	Abdelmagid Mohamed, Gawhar	Peer Tutoring	ACCT 201HYBRID	M	BLACK
4	11/17/2014	11/17/2014	1121860	Abdelmagid Mohamed, Gawhar	Peer Tutoring	ACCT 201HYBRID	M	BLACK
5	11/24/2014	11/24/2014	1121860	Abdelmagid Mohamed, Gawhar	Peer Tutoring	ACCT 201HYBRID	M	BLACK
6	11/17/2014	11/17/2014	1239749	Akinvumi, Ifeoluwa K	Peer Tutoring	ACCT 201HYBRID	F	NSPEC
7	9/24/2014	9/24/2014	1237071	Almond, Darryl J	Peer Tutoring	ACCT 201HYBRID	M	BLACK
8	10/6/2014	10/6/2014	1237071	Almond, Darryl J	Peer Tutoring	ACCT 201HYBRID	M	BLACK
9	11/17/2014	11/17/2014	1237071	Almond, Darryl J	Peer Tutoring	ACCT 201HYBRID	M	BLACK
10	12/1/2014	12/1/2014	1225994	Amoafo, Christopher K.	Peer Tutoring	ACCT 201HYBRID	M	BLACK
11	12/2/2014	12/2/2014	1225994	Amoafo, Christopher K.	Peer Tutoring	ACCT 201HYBRID	M	BLACK
12	12/4/2014	12/4/2014	1232391	Amzat, Gaffar ABAYOMI	Peer Tutoring	ACCT 201HYBRID	M	BLACK
13	12/5/2014	12/5/2014	1232391	Amzat, Gaffar ABAYOMI	Peer Tutoring	ACCT 201HYBRID	M	BLACK
14	9/10/2014	9/10/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
15	9/12/2014	9/12/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
16	9/15/2014	9/15/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
17	9/24/2014	9/24/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
18	9/26/2014	9/26/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
19	10/3/2014	10/3/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
20	10/6/2014	10/6/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
21	10/6/2014	10/6/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
22	10/10/2014	10/10/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
23	10/10/2014	10/10/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
24	10/15/2014	10/15/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK
25	10/17/2014	10/17/2014	1238055	Boyd, Na'Yonna Latia	Peer Tutoring	ACCT 201HYBRID	F	BLACK

Figure 8. Tutee Logbooks, sort by date

Tutor Schedules **(Figure 9)**

1. While under the "Study Hall and Tutoring Services" tab, scroll down to the Tutor Schedules section.
2. View or download tutor schedules by semester in Microsoft Excel.

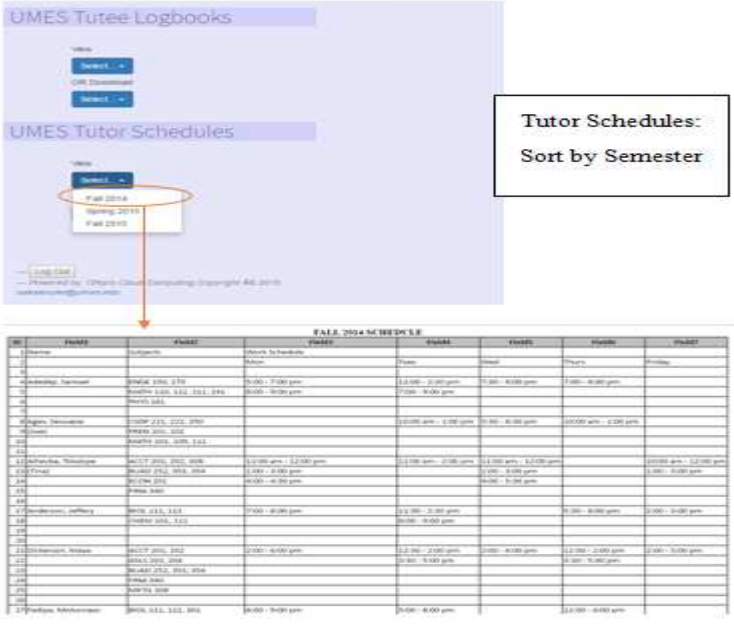


Figure 9. Tutor Schedules, sort by date

Conclusion

There exist a number of cloud computing vendors that provide user-friendly cloud computing programs and Information Technology (IT) services to various organizations, industries, and educational institutions. Cloud computing has become a very important and integral part of IT infrastructure in many organizations due to budget constraints. One of the cloud computing-based tools known as Gradesfirst has been involved in providing services to a number of universities for the purposes of student learning, online education, and assessments. The Athletic Department of UMES is currently using Gradesfirst for the academic advisement of student athletes.

This paper proposed a new user-friendly application enhancing and expanding the current advising services of Gradesfirst with a view to implement new performance activities like mentoring, tutoring, scheduling, and study hall hours into existing tools. This application included various measurements that can be used to monitor and improve the performance of the students in the Athletic Department of UMES by monitoring students' weekly study hall hours, and tutoring schedules. It also supervised tutors' login and logout activities in order to monitor their effectiveness, supervises tutor-tutee interaction, and stored and analyzed the overall academic progress of each student. The proposed application in a cloud computing environment was developed on a Windows environment. A dedicated server for providing services was developed at the local site.

The paper has been implemented in three steps. The first step involved the creation of an independent cloud computing environment that provides resources such as database creation, query-based statistical data, performance measures activities, and automated support of performance measures such as advising, mentoring, monitoring and tutoring. The second step involved the creation of an application known as Student Advising and Retention (SAR) application in a cloud computing environment. This application has been designed to be a comprehensive database management system which contains relevant data regarding student academic development that supports various strategic advising and monitoring of students. The third step involved the creation of a systematic advising chart and frameworks which helped advisors. The paper showed ways of creating the most appropriate advising technique based on the student's academic needs. The proposed application runs in a Windows-based system. As stated above, the proposed application was able to enhance and expand the current advising service of Gradesfirst tool. A brief demonstration of the proposed application highlighted the main features of the existing tool (Gradefirst).

Further Investigation

The Student Advising and Retention application could be broadened to allow coaches, departmental personnel, tutors, and students to access data. Different aspects of the Student Advising and Retention application will need to be designed to allow for direct upload of data to facilitate interaction of all parties responsible for the students' academic retention. A mobile version of this application could also be developed to improve accessibility.

References

Armbrust, M., A. Fox, R., Griffith, A., Joseph, R. K., & Konwinski, A. (2010). Above the Clouds: A Berkeley. Retrieved March 3, 2016, from www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf

Carlozo, L. (2012). Why college students stop short of a degree. *Reuters*. Retrieved March 3, 2016, from http://www.reuters.com/article/us-attn-andrea-education-dropouts-idUSBRE82Q0Y120120327

Craig-Wood, K. (2010). Definition of Cloud Computing, Incorporating NIST and G-Cloud Views. Retrieved March 3, 2016.

Foster, I., Yong, Z., Raicu, I., & Lu, S. (2008). Cloud Computing and Grid Computing 360-Degree Compared. Retrieved January 1, 2016/

Gerdes, H., & Mallinkrodt, B. (1994). Emotional, social, and academic adjustment. *Journal of Counseling*, 72, 281-288. Retrieved March 3, 2016.

Grites, T. J. (1998). On academic advising. *About Campus*, 8, 29-30. Retrieved March 4, 2016.

Hale, M. D., Graham, D. L., & Johnson, D. M. (2009). Are students more satisfied with academic advising when there is congruence between current and preferred advising styles? *College Student Journal, 43*(2). Retrieved March 3, 2016.

IBM. (n.d.). *IBM - What is cloud computing?* Retrieved December 1, 2015, from IBM.com: http://www.ibm.com/cloud-computing/what-is-cloud-computing.html

Leavitt, N. (2009). Is Cloud Computing Really Ready for Prime Time? *Computer*, 15-20. Retrieved February 11, 2016.

McArthur, R. (2005). Faculty-based advising: An important factor in community. *Community College Review*, 32(4), 1-19. Retrieved February 7, 2016.

Mell, P., & Grance, T. (2009). The NIST Definition of Cloud Computing. *Communications of the ACM*. Retrieved January 23, 2016, from http://csrc.nist.gov/groups/SNS/cloudcomputing/

Pargett, K. K. (2011). The Effects of Academic Advising on College. *Educational Administration: Theses, Dissertations, and Student Research*. Retrieved January 6, 2016.

Pascarella, E. T. (1980). Student-faculty informal contact and college outcomes. *Review of Educational Research*, 50(4), 545-595. Retrieved March 15, 2016.

Pietras, S. A. (2010). The Impact of Academic Advising on GPA and Retention at the Community College Level. 10-37. Retrieved February 11, 2016.

Plummer, D., Smith, D., Bittman, T., Cearley, D., Cappuccio, D., Scott, D., & al., e. (2010). Five Refining Attributes of Public and Private Cloud Computing. Retrieved December 6, 2015.

Staten, J. (2008). Is Cloud Computing Ready for the Enterprise? Retrieved November 21, 2015, from http://vu2aut.persiangig.com/ECommerce/Forrester-Cloud-computing-report080307%5b1%5d.pdf/dl

Vouk, M. (2008). Cloud Computing—Issues, Research and Implementations. *Journal of Computing and Information Technology*, 235-246. Retrieved November 14, 2015.

Wang, L., Tao, J., Kunze, M., Castellanos, A., Kramer, D., & Karl, W. (2008). Scientific Cloud Computing: Early Definition and Experience. Retrieved March 11, 2016.

Yang, H., & Tate, M. (2012, 7 1). A Descriptive Literature Review and Classification. *Communications of the Association for Information Systems, 31*(2). Retrieved January 12, 2016.