A Short Survey of Degree Auditing Systems

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Abstract—Choosing the most suitable college courses can be a time-consuming task, given the number of sources from which students need to pull the information regarding degree requirements. In addition, given the limited time and interaction between advisor and student, substantial effort needs to be put in to find a proper path towards graduation. To bridge the gap, a number of degree auditing software systems emerged and evolved, making it easier for students to have a convenient road map and plan their graduation. This study surveys the features of popular degree auditing systems and two research papers, one from Cornell University and the other from Texas State University, on the design and structure of a degree auditing system.

Keywords-courses, degree auditing systems, graduation, requirements, route map

I. INTRODUCTION

A degree audit is an advising document that maps out degree requirements and compares them against the student's transcript. It is an analysis to monitor the completion of degree requirements and track the progress of a student towards graduation. It is a vital tool for academic planning, course selection, and scheduling which should be used in conjunction with consultation with the student's academic advisor. The information contained in a degree audit may depend on the university's curriculum. A degree audit may have all or some of the following information [2]:

- Number of credits completed and required to complete a degree. The requirements are further divided into university, college, and major requirements. This includes the requirements both at the institution and transfer courses.
- Grade point average (GPA) of the student.
- A 'What If' function where students can explore requirements needed to be fulfilled if there is a change in major or concentration and evaluate progress.

It is the responsibility of a student to make sure that in each semester the requirements are being fulfilled and progress is being made towards graduation. The degree audit in most cases gives out a "most likel" scenario and the student, with the consent of the academic advisor, can request a degree audit adjustment which will have the option to choose a different course in order to fulfill requirements. To ease the whole process of planning degree completion, different degree auditing software systems have evolved which offer a wide range of features, taking into account every possible scenario. The following section describes the features of few of the popular degree auditing systems.

II. DEGREE AUDITING SYSTEMS

A. Ellucian Degree Works

Ellucian Degree Works is a comprehensive academic advising transfer articulation and degree audit solution that helps students and their advisors to sort out the requirements on the university's curriculum and is used by over 2,500 universities [3]. Ellucian Degree Works can be easily integrated with any student information system and provides powerful academic planning tools which improve the personal interactions between student and advisor. In addition, the system captures aggregate information which helps senior administration take proper decisions in planning future term course offerings and streamlining the processes for more efficient cost management.
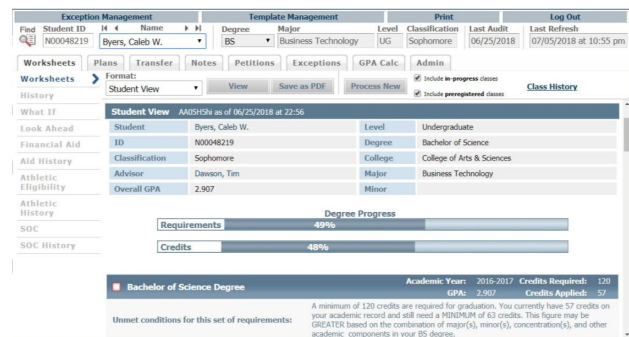

Figure 1.   The degree audit screen of Ellucian Degree Works [4]

- Clarity: Notifies the students regarding what courses they need to take and when to take them.
- Simplicity: All the manual processes associated with degree audits and transfer articulations are removed.
- Academic advising: There is a direct access to web based worksheets and related hyperlinked information, with which the students are bound to spend less time deciphering degree requirements and more time pursuing academic goals.

- Academic goals: : Ellucian Degree Works allows advisors and students to create detailed educational plans to guide every student to a more successful outcome and with the use of a friendly GPA calculator, tedious manual calculations can be eliminated.
- Research reporting: Ellucian Degree Works includes a storehouse of advice, audit and plans and a virtual road map to future course work demand and emerging enrollment patterns.

Ellucian Degree Works Benefits		
Benefits for students	**Benefits for Advisors**	**Benefits for instituitions**
Real time advise and counsel	More personalized advising	Imporved completion rates and time to graduation
Interactive "What If?" scenario planning	Improved retention and graduation rates	Robust analytical and decision support tools for instituitional planning
More transparent course and credit transfer	More transparent transfer articulation	
Clear path to graduation	Clear and consistent degree plans	
Easy access to related service and advice	More timely degree certification	

Figure 2.   Benefits of Ellucian Degree Works

B. uAchieve from College Source Inc.

uAachieve is a comprehensive and cloud based degree audit system that ensures students and advisors have the information they need, when they need it [5]. uAachieve provides a tailored report illustrating each student's progress and outlines the remaining courses and requirements to graduate. By supporting student and advisor collaboration in the process of planning the academic career, uAchieve ensures that the students have accurate, complete, and personalized information for achieving their educational goals. The features of uAchieve are described below:

- uAchieve ensures real-time integration with the existing student information systems.
- Simplifies the analysis of degree audit data with a report library template and allows students to quickly view how
- uAchieve facilitates multiple majors, concentrations and other supplemental information and enables 'What if?' scenario planning.
- Handles exceptions, waivers, test scores and other non course requirements and offers text, pdf, and html formatting options.
- Additional module (add on)- Batch access software gives access to the staff to define, run, schedule, share, analyze, and print batches of audits without being dependent on the technical staff.
- Benefits of using cloud: The environment can be adjusted to match the needs and new batches can be created or components can be added to the test environments.
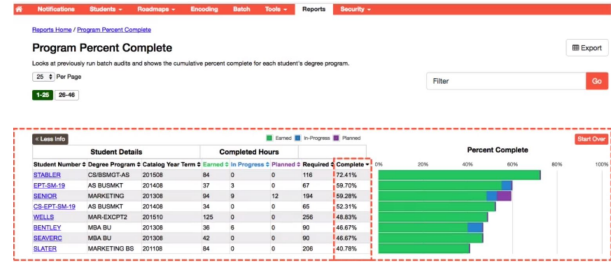

Figure 3.   User interface of uAchieve.

C. Degree Navigator from Decision Academics

Degree navigator is a fully configurable academic advising solution. It can be deployed to an institution or state wide system faster than the industry average. Degree Navigator speeds up the degree audit approval process and facilitates advisor and student interaction, readily scaling with the requirements of mid-sized to large institutions and state wide systems. Overall advisor and administrative workload is reduced, resulting in increased staff efficiency, student satisfaction and improved time to degree. The features of Degree Navigator are listed below [6]:

- Degree Navigator integrates with the current student information system database platform which simplifies and enables database manageability and transcript retrieval without interrupting the advisor or administration functions.
- 'What if?' analysis provides students with the ability to see the impact of changing degrees and allows them to quickly evaluate how existing credits will meet the requirements of a different degree. A generated report shows the student how their profile fits program requirements.
- Multiple rule type support handles the most complex degree requirements through the automation of degree auditing and provides students with the ability to track their own degree progress.
- Interactive secure notes forum enables students and advisors to interact privately and securely by posting messages and responding as desired.
- Change to degree and degree exception allows students and advisors the flexibility to analyze degree or program changes to invoke degree exceptions that improve time to graduation goals.

The benefits of Degree Navigator can be summarized as follows:

- Integration Capability: Degree Navigator can be easily integrated with Decision Academic's Transfer Navigator, Catalog Navigator and Curriculum Navigator, incorporating each product as needed without hassle and interruption to student information management. This capability allows administrators, advisors and students

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to easily view or manage entire curriculums including student degree details, transfer and catalog information.

- Application configurability: Degree Navigator is fully configurable through a secure web-based interface. Customers can configure the look and feel of their site, as well as the terminology it uses to respond to how they want to manage their degree audit process, better clarifying student degree information collection and analysis.
- Easy to use: Drag and drop features such as the degree editing tool, allows users to create, access and validate institutional degree requirements. The straightforward interface enables users with little computer training to start using Degree Navigator quickly and effectively.
- Flexible: Degree Navigator provides great flexibility in capturing student data through editable forms. In addition, Degree Navigator provides pricing models for both stand-alone and integrated options, offering institutions and state wide systems an adaptable solution to meet their unique requirements.
- Customer Support: Decision Academic provides training sessions and support to ensure that student data management runs smoothly.

D. Empowersis from Service Oriented:

Empowersis has a sub module - Plan of Study, a powerful advising tool offering a term by term plan designed to help students to graduate on time, which integrates with the degree audit module to show which courses to take and when to take them to meet the requirements [7]. The features of Empowersis are listed below:

- Easy to implement, standard and custom graphical templates are provided so that the appearance and styles can be managed.
- Inquiry and application information is passed to admissions processes with no re-keying of information. Online registration and payments eliminate lines in office.
- The services are available to the students and the staff as per their schedule and the web portal is available round the clock.
- Online course evaluations and other data gathering can be implemented with the survey tools and the survey can be public, private, or attached to a course.
- Consistent and accurate: The same procedures, rules and policies used by on-campus administrators control the web portal functions and information access.
- Personalized: Students, faculty, staff, alumni and others can personalize their portal experience with their website by choosing and positioning a range of elements on their custom launch pages.

III. RELATED REASEARCH WORK

A. CPAS: On the Structure and Usability of a Course Planning and Audit System:

The Course Planning and Auditing System (CPAS) from Cornell university is a well designed web interface which provides semi automatic audit of degree requirements. CPAS uses simple logical foundations for the back end and principles of web design and user interface in the front end [8]. The requirements, in general are represented in a tree based visualization scheme. Since a fully automated solution is impossible as some requirements need the approval of advisor, CPAS integrates the automatically auditable requirements with those that must be manually approved using the web interface. CPAS has two user types: students and administrators and the administrators are further divided into three types with increasing permissions, advisor, staff and supervisor. The roles are based on the principle of least privilege where each user gets the least amount of privilege necessary to complete the job. Course work logic: The underlying logic starts from categorizing the courses into arbitrary number of groups called categories. The requirements are classified into three types: individual courses, option groups, and free text requirements based on the complex nature of academic programs. Individual courses are specific to the department and are represented by a course name and number. Option groups are further divided as shown in the figure. The overall requirements are divided into individual requirement units which can be defined as a high level requirement covering a certain theme. The requirements are further divided as "graduation only," "affiliation only," "affiliation and graduation" and "non course" requirements. Each requirement unit forms a binary tree and if the root
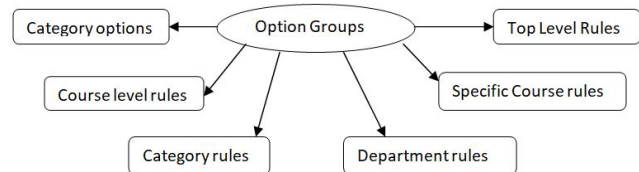
Figure 4.   Grouping of Requirements in CPAS.

evaluates to TRUE, the requirements are completed and if the root evaluates to FALSE, the user interface flags the incomplete courses. CPAS uses graphical interface and basic XHTML components with an underlying CSS stylesheets and javascript for dynamic components. There are two proposed models for CPAS architecture:

1) University central model where CPAS would be given to the universities as an audit tool for administration, but considerable research is being done in order to build the standardization and interface between the complex systems which need to interact.

2) Social network architecture, which applies the principle of Wikipedia to CPAS. This area is being actively investigated to improve the efficiency.

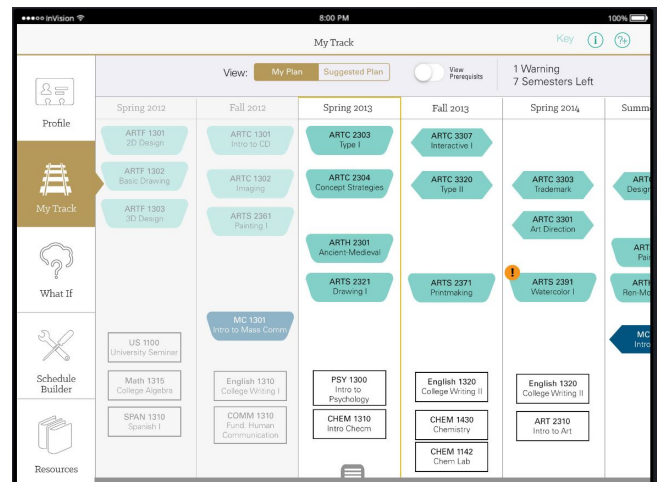CPAS is a simple, robust logical framework with an elegant user interface, however, questions such as how the system can be used to compare major requirements of various universities and/or find errors in the existing model are still open to research.

B. *Design and Construction of Visual Degree Audit Software: An Application of Visual Communication, Project Management and Graph Theory:*

This Honors thesis by Emily Hom-Nici researches the current advising practices and technologies at Texas State University and suggests a new solution for the shortcomings [9]. The shortcomings in the system were identified through a gap analysis which was conducted in the form of a student survey. The thesis has three objectives; the first is to develop a new approach for the degree auditing system using communication design, project planning and graph theory, called the Visual Degree Audit (VDA). The second objective is to design and test the developed application and the third is to test and determine if the new application has the potential to assist students successfully. VDA provides a wider view of the education path of the student, from orientation to graduation which includes graduation dates, hours per semester, additional electives, etc instead of focusing only one semester ahead using graph theory and communication designs and display the major in a graph like form to illustrate course requirements and prerequisites. VDA creates a stronger relationship between advisors and students where advisors can provide, suggest and view plans. VDA also includes a question bank of saved questions which can help in a faster advising and thus, save time and effort. Along with the suggestions by advisors and students, VDA uses project planning techniques, graph theory, and communication design practices. Even though the prototype was developed in an iPad mockup, the thesis intended to come up with a rich internet application (RIA) because of its abilities for interactivity, responsiveness, richness, and ability to be available on more than one platform. A survey was conducted to evaluate the performance of VDA and it was concluded that VDA was successful in providing a more interactive, controllable interface for students to gain control of their personal ambitions and a stronger platform for student advisor relationship.

IV. CONCLUSION

A wide variety of degree auditing software packages are available and are used by a number of educational institutions today. However, a fully automated solution for capturing the requirements has not yet been incorporated owing to the complex nature of the requirements and the numerous sources from which a student/administration has

Figure 5. The interface of VDA [10]

to pull the information, and this provides avenues for future research.

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