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## DESIGN AND DEVELOPMENT OF AN ACADEMIC ADVISING SYSTEM FOR IMPROVING RETENTION AND GRADUATION

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### ABSTRACT

*Graduation and retention is a major concern for all universities. Faculty members, in spite of their teaching, research and service loads, are being asked to pay more attention to students' advisement. The quality of faculty advisement is also being monitored at the highest level. Although most universities have implemented student advisement systems through ERP systems, these advisement systems do not provide the desired support to faculty for advisement. This is more evident where a university has implemented an out-of-the-box solution from a vendor without major customization. This paper describes an Advisement System designed to mitigate the issues of an out-of-the-box implementation at a southeastern university to help improve retention and graduation.*

**Keywords:** Information Technology (IT), Advisement, Retention, Database, Web-based systems, Role of Faculty.

### INTRODUCTION

Faculty academic advising has a significant impact on a student's academic success. A recent report has found that over 75% of private institutions in the U.S. have instituted a policy of mandatory one-on-one faculty advising with over 84% of these institutions reporting that this strategy is effective in improving retention and graduation [1]. A recent doctoral dissertation found that the more a student and his or her advisor discussed personal and school-related issues, career options, college policies, academic deadlines, and study skills and tips, the more likely it was that the student positively developed and had a higher level of satisfaction with college [6].

Historically, many colleges have received state funding based on how many full-time equivalent students are enrolled at the beginning of the semester. Twenty-five states—Arizona, Arkansas, Florida, Illinois, Indiana, Kansas, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Mexico, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah and Washington—have a funding formula in place that allocates some amount of funding based on performance indicators such as course completion, time to degree, transfer rates, the number of degrees awarded, or the number of low-income and minority graduates [7].

Retention and graduation rate is becoming the mantra in many universities across the U.S. Table-1 below summarizes the retention and graduation rates for different types of universities [5].

University Selectivity Type	First to Second Year Retention Rates	6-Year Graduation Rates
Highly Selective (Top 10% HS; ACT 25-30)	90%	86%
Selective (Top 25% HS; ACT 21-26)	84	60.5%
Traditional Selective (Top 50% HS; ACT 18-24)	70.6%	43.7%
Liberal Selective (Bottom 50%; ACT 17-22)	59.1%	38.5%
Open (No %; ACT 16-21)	57.4%	36.8%
All Master's Granting Public	72.2%	44.4%

Retention and Graduation is a major issue in all universities except the highly selective universities.

### **CURRENT STATE OF FACULTY-LED ADVISEMENT**

Tier-1 universities in the U.S. have dedicated professional staff for advisement. The role of faculty in such institution is best summarized by the following quote of Dr. Cecilia Gaposchkin, Assistant Dean of the Faculty for pre-major advising [2]:

*The advising system consists of a host of different resources and people that students will access at different points during their academic careers. The system is decentralized by design. The enormous range of available opportunities means that no single person has mastery of all the possible paths or options. Thus, students won't have a single advisor throughout their entire time at Dartmouth, though at any given time they may rely on the advice of an individual person (faculty member, administrator, peer advisor) to a greater or lesser extent. As a student moves through Dartmouth, the nature of the advice a student needs changes dramatically, and with these changes so do the appropriate advice-networks. Academic advising works best when a student appreciates his or her own role in understanding the questions they have and taking the initiative to seek the advice they need.*

In smaller universities faculty have to carry the full-load of advisement. Some faculty do not take this role seriously. One reason is that advising has very rarely been fully integrated into the faculty assessment and reward system, i.e., teacher/scholar/service tenure process, the dilemma of either no assessment/reward system or parallel advising systems of assessment and recognition is one reason for faculty not taking this role very seriously [4].

Most universities have instituted online ERP systems with built-in advisement systems. In some of the smaller universities, these systems have been implemented out-of-the-box. Customization of these systems has been slow as they need consultants and are expensive to implement. Motivating faculty to use the system that is not very intuitive (a system that forces them to navigate multiple screens for basic information) has proved to be difficult. Such implementations have required faculty to keep paper-records, thus making the whole process laborious, tedious and difficult to monitor.

The three major student systems software vendors are Oracle's PeopleSoft, SAP Campus Management, and SunGard's Banner and most universities in the U.S. use one of these three systems. Our campus has adopted the PeopleSoft system. Contrary to "PeopleSoft philosophy" and marketing claims, PeopleSoft Campus Solutions (CS) is about 80% complete, as delivered. In other words, there is a lot missing that has to be customized [3].

This paper presents a web-based system developed by the Computer Information Systems department at a southeastern university in the U.S. The system was designed with two main objectives, one was to provide a one-page view of the students' demographics and academic progress for faculty advisement and the second was to monitor the effectiveness and the quality of faculty advisement by the college administration. This system has been successfully adopted by the entire college of business administration and has met both the objectives set forth.

### **PEOPLESOFT'S CAMPUS SOLUTION**

PeopleSoft Campus Solutions is an expensive solution. Universities such as Stanford, Arizona State and Penn have made the PeopleSoft implementation in their campus a great success through major customizations. Smaller schools, who do not have the technical and financial resources, have implemented the out-of-the-box solution. Such institutions have had limited success with their PeopleSoft implementation. Many units at such universities still use their own spreadsheets for processes that should be handled by the system. Training of users and customization to make the system easier to use are two major issues with the system.

Although PeopleSoft Campus Solution provides a student advisement module, the system is not easy to use. It is a windows-based system that uses a number of navigation links. A faculty advisor is presented a list of the advisees on a page. Each student is hyperlinked to a new page that displays some of the academic information of the student. Although all courses attempted by the student are listed with the semester and the advisor can sort the list on semester, the sorting is not chronological. The fall semesters are listed first, followed by spring and then by summer semesters. This should be an easy fix, because the data for semester is coded as 2141 for spring, 2146 for summer, and 2148 for fall.



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The advisor is presented with a drop-down with a list of all advisors. On selection of an advisor, all advisees of that advisor are displayed on a second drop-down list. The advisor selects the advisee and all information necessary for advisement is presented on the page. The page has 7 modules as described in Table-2 below:

**Table-2: Important Modules of the Advisement System**

**Module 1** (Displayed on a GridView)

ID	Term	GPA	Hours	GPA	Hrs FA	Pass FA	Curr	Major	Grad	Honors
010052805	2141	3.094	106		129	106	17	MGT		False

- ID
- Last Term (Semester- 2141: semester starting in month 1 of year 2014-Spring 2014)
- Cumulative GPA
- Cumulative Hours attempted for GPA
- Cumulative Hours attempted Financial Aid (includes current semester)
- Cumulative Hours Passed for Financial Aid
- Current hours enrolled
- Major
- Filed for Graduation
- Honor Student

The Satisfactory Academic Progress (SAP) is also displayed indicating whether the student is on probation or under watch.

**Module 2** (Displayed on a GridView-User can sort the data on any column)

PROGRESS					Failure(s)		
TERM	COURSE	GRADE	HOURS	AREA	SUBJECT	COUNT	GRADE
2141	FIN 321		3	5.07	ACT 215	1	F
2141	MGT 331		3	5.60	ACT 215	1	W
2141	MGT 460		3		CIS 205	1	F
2141	MGT 421		3		CIS 205	1	W
2141	MKT 336		3		CIS 329	1	F
2141	BIOL 128		1	3.51	CIS 329	1	W
2141	BIOL 127		1	3.41	CIS 404	1	I
2138	CIS 329	B	3	5.10	CIS 461	1	I
2138	ECO 201	B	3	5.10	CMS 205	1	W
2138	MGT 321	A	3	6.09	ECO 252	1	X
2138	MGT 202	A	3	5.20	ENG 131	1	F
2138	MKT 321	A	3	6.09	ENG 210	1	D
2136	ECO 252	A	3	4.30			
2136	ACT 215	B	3	5.50			
2131	MA1 137	A	3	3.10			
2131	MGT 304	B	3	6.06			
2131	MGT 220	B	3				
2131	ECO 251	A	3	4.20			
2131	CIS 302	A	3	7.20			
2131	ACT 214	B	3	5.40			
2128	MGT 204	C	3	6.03			
2128	MGT 356	B	3				
2128	MA1 137	D	3	3.10			
2128	ENO 210	B	3				
2128	BIOL 128	C	3	3.52			

- Semester (as coded and allows for chronological sorting)
- Course
- Grade
- Hours
- Area (each major has seven areas: Area I-IV are general study, Area V is Pre-Professional, Area VI is Core Business Courses and Area VII is Major courses). Sorting the data on Area shows the advisor the degree audit and what courses in each area that

the student needs to take.

This module also displays the failed (D/I/F/W/X) courses on a separate GridView.

**Module 3:** Advisors are required to prepare a 3 semester plan for the students and record it in this module.

PLAN	
SEM	COURSE
Edit 2131	ECO201 ACT214 ECO251 MGT220 MGT304
Edit 2136	ECO252 MGT202
Edit 2138	MGT331 MGT321 MKT321 CIS329 ECO250
Edit 2141	FIN321, MGT331, MGT421, MGT460, MKT336
Edit 2146	
Edit 2149	PED114, MGT400, MGT422, MGT325, MGT462
Edit 2151	

**Table-2: Important Modules of the Advisement System**

**Module 4:** Advisors can see the email/phone/address of their advisees on a GridView. They can also email their advisees from this page.

Email	Phone	Address																				
		<table border="1"> <thead> <tr> <th>Address_1</th> <th>City</th> <th>County</th> <th>Postal</th> </tr> </thead> <tbody> <tr> <td>915 South Jackson Street Facility 2 R307</td> <td>Montgomery</td> <td></td> <td>36104</td> </tr> <tr> <td>915 South Jackson St Facility 2 R307</td> <td>Montgomery</td> <td>USA</td> <td>36104</td> </tr> <tr> <td>915 South Jackson Street Facility 2 R307</td> <td>Montgomery</td> <td></td> <td>36104</td> </tr> <tr> <td>2280 Campbellton Rd Apt 104</td> <td>Atlanta</td> <td></td> <td>30311</td> </tr> </tbody> </table>	Address_1	City	County	Postal	915 South Jackson Street Facility 2 R307	Montgomery		36104	915 South Jackson St Facility 2 R307	Montgomery	USA	36104	915 South Jackson Street Facility 2 R307	Montgomery		36104	2280 Campbellton Rd Apt 104	Atlanta		30311
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2280 Campbellton Rd Apt 104	Atlanta		30311																			

**Module 5:** The College has implemented a RFID based attendance system. The number of classes attended by each student for each of the classes is shown on a GridView. This helps in counseling students who miss classes and make poor grades.

ATTENDANCE(2141)		
ID	COURSE	#DAYS
010052805	FIN.321.01.2141	2
010052805	FIN.321.02.2141	17
010052805	MGT.331.01.2141	1
010052805	MGT.331.02.2141	10
010052805	MGT.421.01.2141	19
010052805	MGT.460.01.2141	18
010052805	MKT.336.01.2141	8

**Module 6:** The gist of all advisements can be recorded in the database. A simple interface is provided for data entry.

DATE	COMMENTS
4/24/2013	[Summer 13 classes: ECO252, CIS329, ACT215]
COMMENTS	
Insert Cancel	

**Module 7:** Reports (Generated using Crystal Reports)

1. Advise list per department
2. Advise list per advisor
3. Advisement report for a selected period through an Executive Information System.

On request of the faculty, an additional module for checking the pre-requisites for courses was also added to the system. This was an easy implementation since the data was already available in the database. The page for this application displays all the courses on a drop-down list and on selection of a course, all students that have not met the pre-requisites are displayed along with the deficient courses.

### DESIGN AND IMPLEMENTATION ISSUES

The system was designed using ASP.Net. The database was implemented in Access. The table structure matched the structure of the database used by the PeopleSoft system, making future migration to live Oracle tables easier. Reports were designed using Crystal Reports and integrated with the ASP.Net application. Security, through user authentication, was built into the system. The data is updated daily during the advisement period and during the 1<sup>st</sup> week of the semester. Thereafter it is updated every 2-weeks or whenever deemed necessary. We have a pending request with the MIS to provide read-access to the Oracle database, but they have been reluctant to do that. A simple data structure is shown in Figure-2 below.

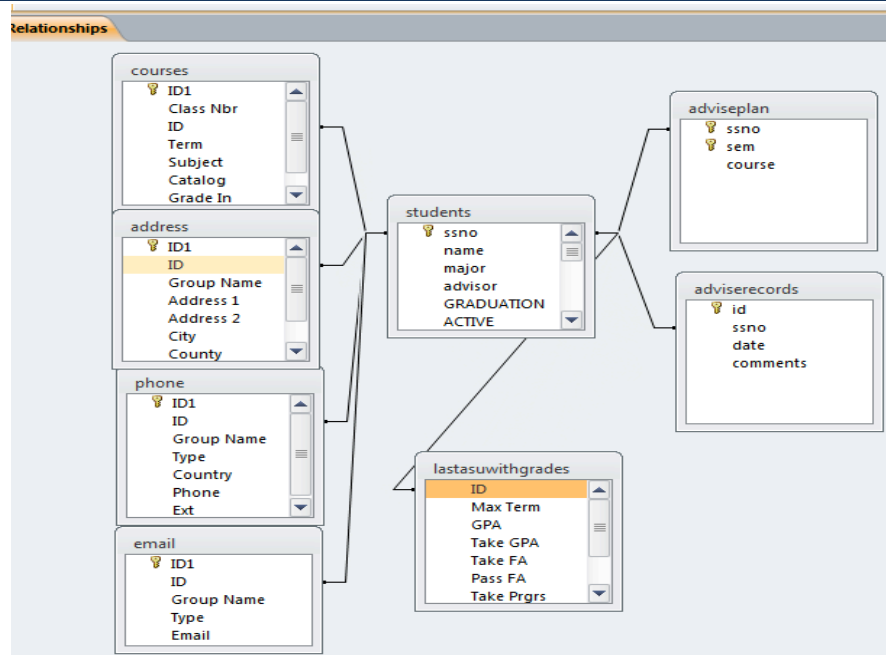


Figure 2: Data Structure for the Advisement System

## CONCLUSIONS

Given that “the quality of academic advising is the single most powerful predictor of satisfaction with the campus environment,” it is disturbing to note that college student’s rank advising so unfavorably [8]. Student satisfaction with faculty advising is very polarized, tending to rate this kind of interaction very favorably or very poorly [8]. One reason is that the faculty are neither trained nor assessed for the quality of their advisement. This paper describes an attempt to closely involve faculty with student advisement through a web-based advisement system. The system has worked remarkably well with high-level of satisfaction reported both by the students and the faculty.

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