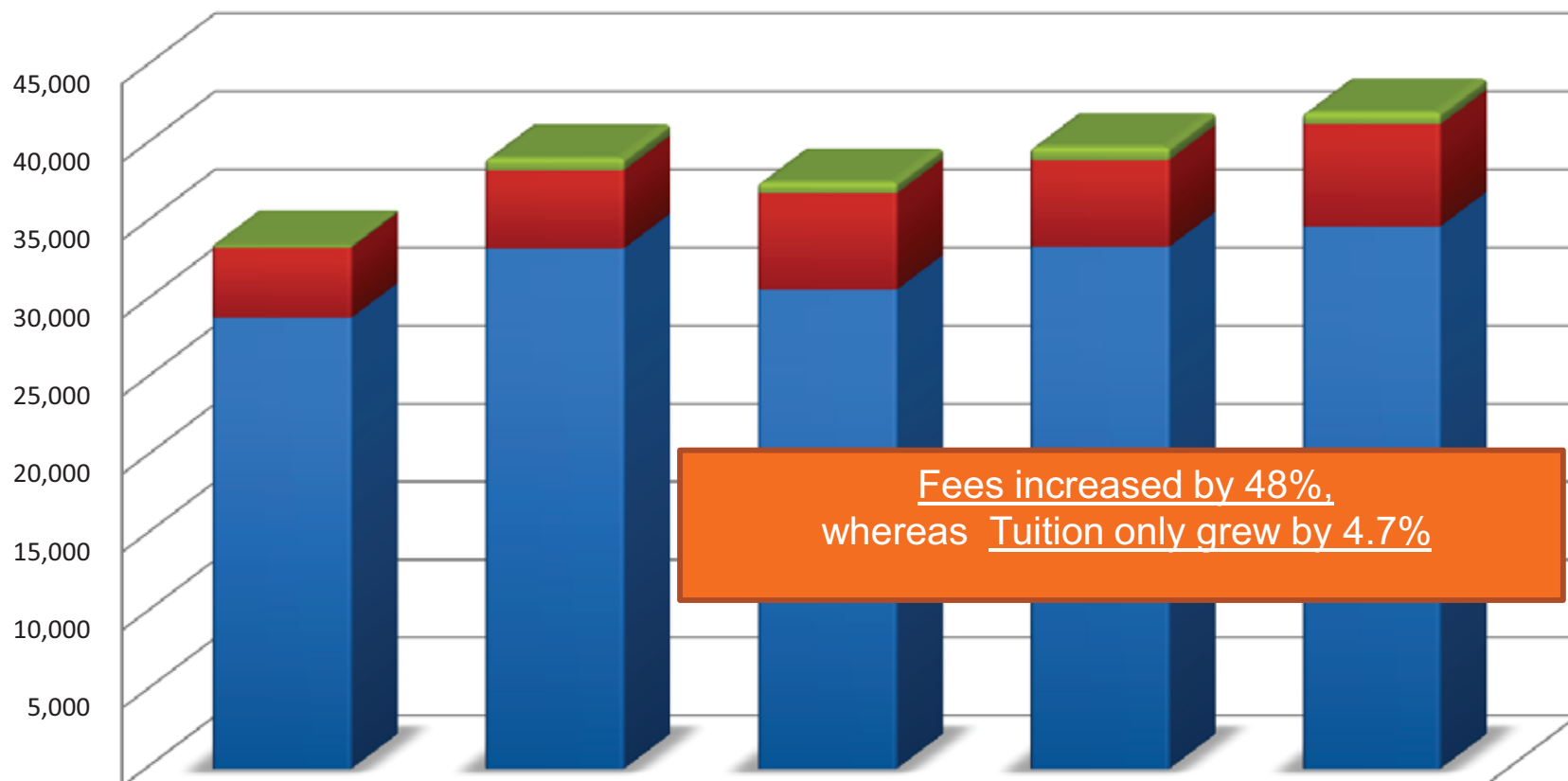




Leveraging Costing Models to Identify Opportunities within a University

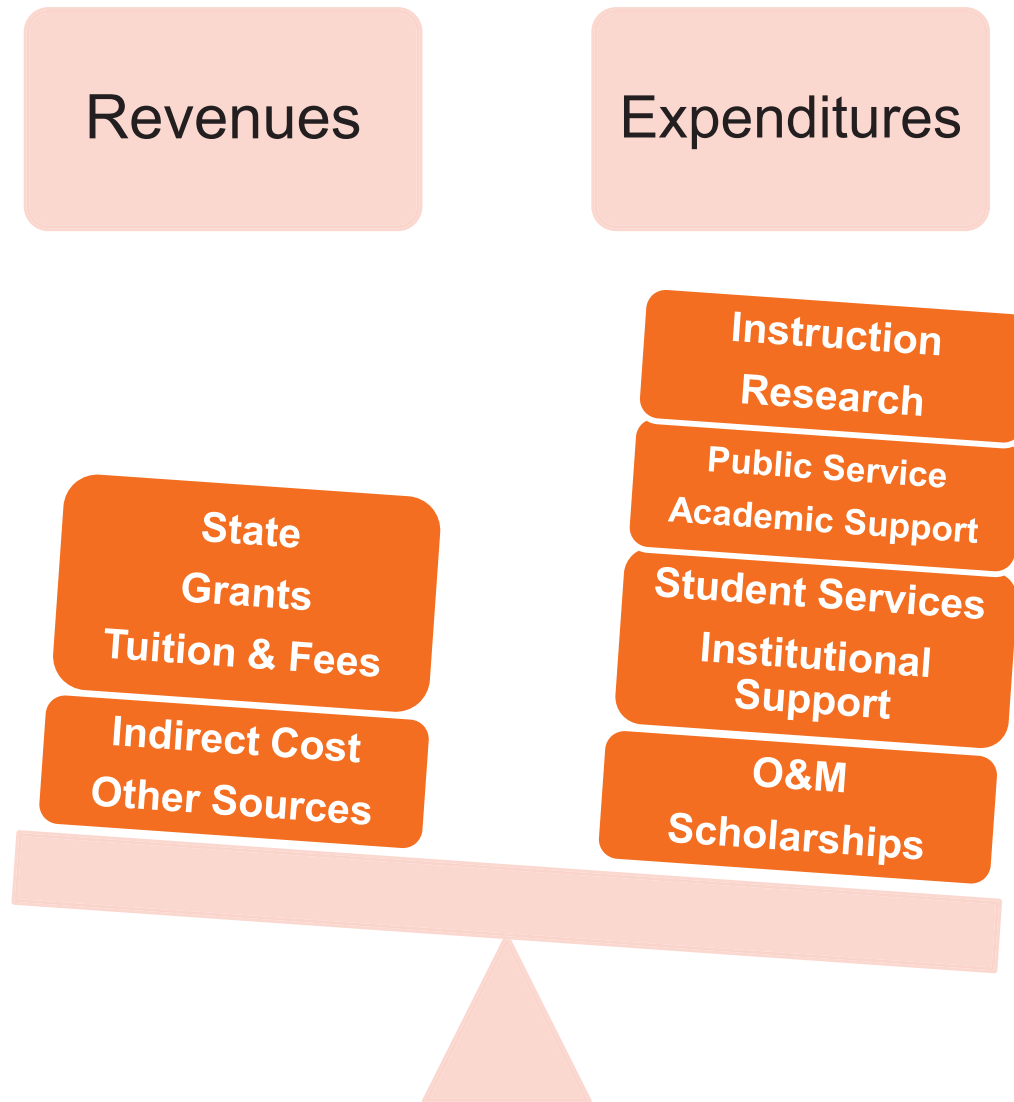
Case for Change: University Funding is Challenged

Tuition and Fees Analysis of all fund sources



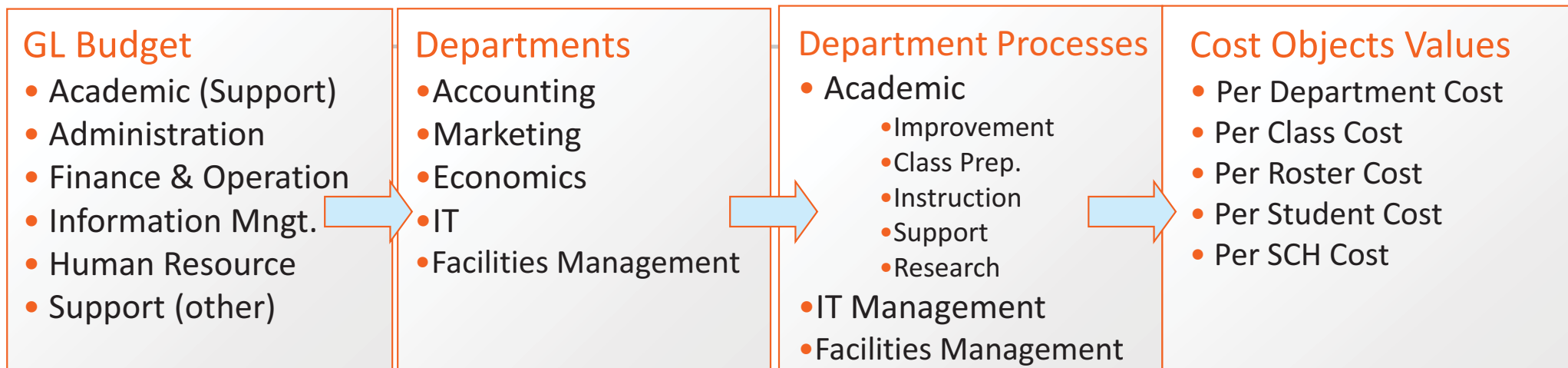
	2004	2005	2006	2007	2008
■ Fees	164	783	724	826	784
■ Non-resident fee	4,489	5,005	6,164	5,560	6,529
■ Tuition	28,891	33,340	30,688	33,444	34,736

Case for Change: How we Actually Balance



The Process of Fully Loading Cost in Academia

“The Decomposition & Reconstruction of University Budgets”



- **Departmentalize GL.**

Approximately 30,000 accounts have been driven to over 300 departments

- Shared expenses (i.e., rent, supplies) are departmentalized based on known data (e.g. square footage, # employees, # terminals, work order data)

- Drive fully loaded department expense to the **department process** (Easy because usually a department has only one process)

- Study the process and build the **time-based algorithm** of 470 process algorithms)

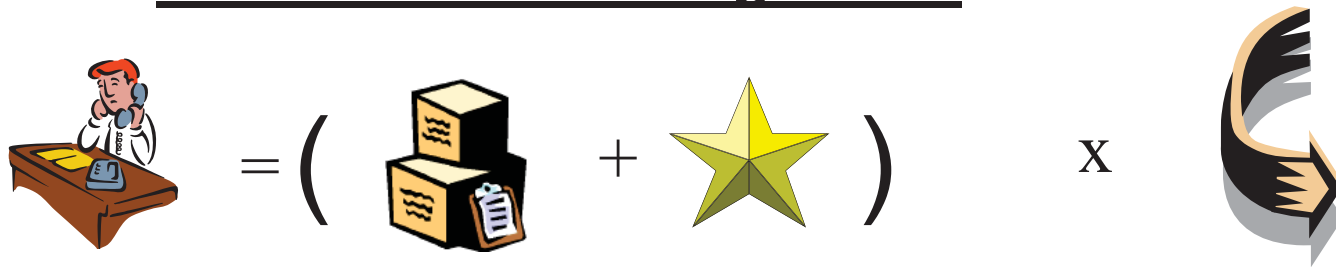
- Drive fully loaded process expense to the appropriate cost objects (Easy because time-driven model pulls directly from **class roster and student files** to populate its algorithms)

- More accurate because cost information is built from the bottom up

TDABC “Time Equations” as a tool for reconstruction

Time / Event Driven Costing recognizes the variability of every transaction and simulates resources consumed and their costs.

The Class Preparation within Accounting is just one of several processes performed by a Professor. This process can be modeled by **ONE Time Driven ABC Algorithm**



Class Preparation Time	Prepare initial set Of Information (33 hours)	Class specific work (40 hours per credit hour Per semester)	Complexity of More students (1.5 factor)
------------------------	---	---	--

3 Activities becomes 1 Automated Process !

Equation: $\text{if}(\text{DEPT_ID}=="\text{ACCT}",1,0) * (33 + 40 * \text{CREDIT_HRS}) * \text{if}(\text{NUM_ENROLLED} > 20, 1.5, 1)$

TDABC “Time Equations” as a tool for reconstruction

Work in Progress

Activity Equation List

Show LIKE Search Number of Results: 278

ID ▲ ▼	Activity Name ▲ ▼	Cost Object ▲ ▼	Equation ▲ ▼
48686	Accounting - Academic Improvement	Class	if(DEPT_ID=="ACCT",1,0)*(10*NUM_ENROLLED)
48684	Accounting - Class Prep	Class	if(DEPT_ID=="ACCT",1,0)*(2000+2*16*CREDIT_HRS*6...
48682	Accounting - Instruction	Class	if(DEPT_ID=="ACCT",1,0)*(16*CREDIT_HRS*60*1.25)...
48680	Accounting - Reasearch/Grant Dev	Class	if(DEPT_ID=="ACCT",1,0)*(50+5*NUM_ENROLLED+if(C...
48678	Accounting - Student Support	Class	if(DEPT_ID=="ACCT",1,0)*(200+60*NUM_ENROLLED)
48676	Art - Academic Improvement	Class	if(DEPT_ID=="ART",1,0)*(10*NUM_ENROLLED)
48674	Art - Class Prep	Class	if(DEPT_ID=="ART",1,0)*(2000+2*16*CREDIT_HRS*60...
48672	Art - Instruction	Class	if(DEPT_ID=="ART",1,0)*(16*CREDIT_HRS*60*1.5)*1...
48670	Art - Reasearch/Grant Dev	Class	if(DEPT_ID=="ART",1,0)*(50+5*NUM_ENROLLED+if(CO...
48668	Art - Student Support	Class	if(DEPT_ID=="ART",1,0)*(200+60*NUM_ENROLLED)
48622	Athletics - Class Preparation	Class	if(DEPT_ID=="HPER",1,0)*(2000+2*16*CREDIT_HRS*6...
48620	Athletics - Instruction	Class	if(DEPT_ID=="PUHS",1,0)*(16*CREDIT_HRS*60*1.25)...
48618	Athletics - Recruiting	Class	1

Activity Equation Details

This is a read-only display of the selected activity's equation and a description of the equation. To edit them, click the Edit button above.

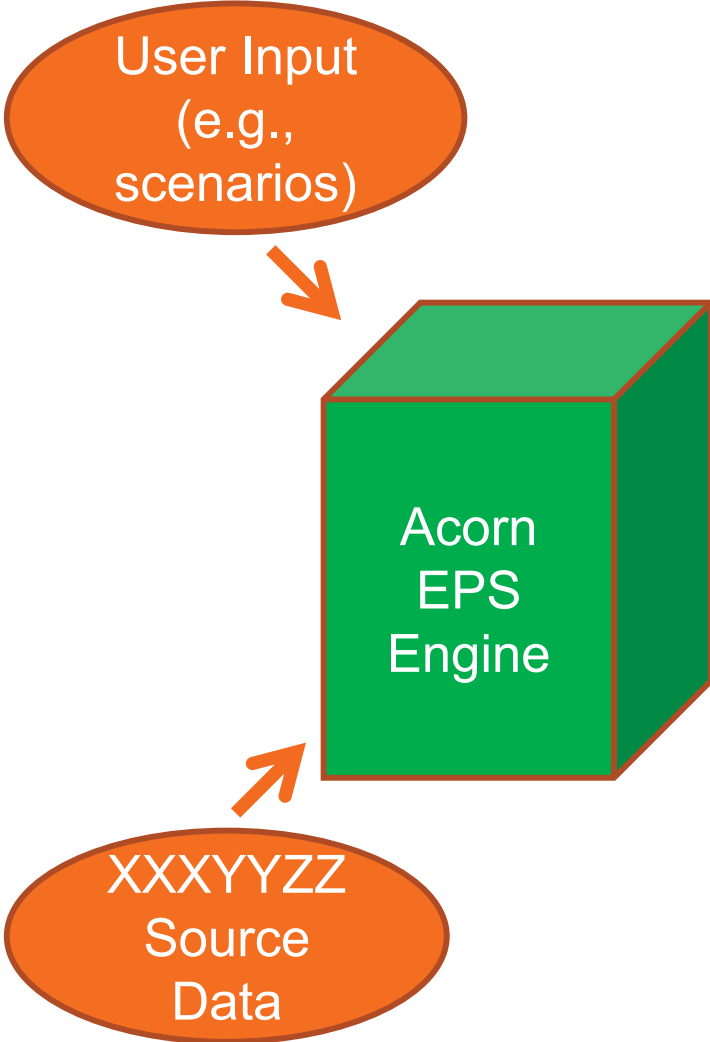
Activity Name	Accounting - Instruction	Activity ID	48682
Cost Object	Class		
Description			
Equation	if(DEPT_ID=="ACCT",1,0)*(16*CREDIT_HRS*60*1.25)*if(NUM_ENROLLED>20,1.25,1)		

These algorithms estimate time spent on an activity (e.g., instruction) for a cost object (e.g., class). This enables us to drive a specific department's instruction cost to a particular class, and then on to specific students

Executive Summary of Costing System for University

- Step 1 – Built model to reflect operations of University (college, departments, processes)
- Step 2 – Drive costs to reflect impact of indirect cost / shared services
- Step 3 – Incorporate time equations
- Step 4 – Load class roster and student data
- Step 5 – Run model to identify high cost and low utilization areas
- Step 6 – Identify opportunity areas

Cost Model Results



College of Business \$8,944,126.53

Top 10 College of Business Costs	Total Costs	% of COB Total	Hours	Rate/Hour
<i>Economics, Finance And Gen Bus - 210030 - INSTRUCTION</i>	\$1,711,799.52	19%	3,185.00	\$537.46
<i>Economics, Finance And Gen Bus - 210030 - CLASS PREP</i>	\$1,069,874.70	12%	9,605.50	\$111.38
<i>Economics, Finance And Gen Bus - 210030 - REASEARCH/GRANT DEV</i>	\$1,016,380.97	11%	135.2	\$7,517.61
<i>Economics, Finance And Gen Bus - 210030 - STUDENT SUPPORT</i>	\$855,899.76	10%	1,526.00	\$560.88
<i>Economics, Finance And Gen Bus - 210030 - ACADEMIC IMPROVEMENT</i>	\$695,418.56	8%	202.8	\$3,429.09
PhD in Business Administration - 210090 - IT MGMT	\$384,079.08	4%	204.708	\$1,876.23
Marketing - 210060 - IT MGMT	\$384,079.08	4%	155.008	\$2,477.80
Accounting - 210010 - IT MGMT	\$384,079.08	4%	147.908	\$2,596.74
Economics, Finance And Gen Bus - 210030 - IT MGMT	\$384,079.08	4%	147.908	\$2,596.74
Entrepreneurship (Bus. Ed & Admin S - 210020 - IT MGMT	\$384,079.08	4%	147.908	\$2,596.74

Bottom 10 College of Business Costs	Total Costs	% of COB Total	Hours	Rate/Hour
Marketing - 210060 - ACADEMIC IMPROVEMENT	\$15,131.38	0%	223.35	\$67.75
Marketing - 210060 - STUDENT SUPPORT	\$18,623.23	0%	1,645.00	\$11.32
Marketing - 210060 - REASEARCH/GRANT DEV	\$22,115.09	0%	148.9	\$148.52
Marketing - 210060 - CLASS PREP	\$23,279.04	0%	8,611.00	\$2.70
Marketing - 210060 - INSTRUCTION	\$37,246.47	0%	2,780.00	\$13.40
Accounting - 210010 - ACADEMIC IMPROVEMENT	\$103,587.28	1%	129.6	\$799.28
Accounting - 210010 - STUDENT SUPPORT	\$127,492.04	1%	996	\$128.00
Accounting - 210010 - REASEARCH/GRANT DEV	\$151,396.80	2%	86.4	\$1,752.28
Accounting - 210010 - CLASS PREP	\$159,365.05	2%	7,035.00	\$22.65
Accounting - 210010 - INSTRUCTION	\$254,984.08	3%	2,355.00	\$108.27

Accounting Fully Loaded

Structure example

- Accounting Department
- Current 2008 Budget View

- Fully Loaded Accounting
- Department 2008 Budget View

- Salaries
- Fringe
- Professional Fees
- Commodities
- Travel
- Equipment
- Total \$923,849.00

- Salaries
 - Fringe
 - Professional Fees
 - Commodities
 - Travel
 - Equipment
- } Direct Support Services (DSS)

Sub Total \$503,042

- IT General (per PC Count & Phone Line)
 - IT Demand (work orders)
 - HR General (per Headcount)
 - Facilities General (per Square Ft)
 - Facilities Demand (work orders)
- } Shared Support Services (SSS) \$420,807.00

Total = \$503,042 + \$ 420,807 = \$923,849

University Current Budget View

Acorn EPS Calculation

“The current budget view does not give department leaders insight into the total cost of programs”

College of Business - Department Cost Flow Summary

The fully loaded cost of the College of Business provides a road-map with which we can begin to identify real cost saving opportunities through scenario based simulations using Acorn Operations Performance simulations(OPS).

Departments to Activity Allocations – Validated by respective Department Chairs

	Cost Driver	Accounting	Marketing	Economic	Entrepreneurship	PhD in Bus. Administration
ACADEMIC IMPROVEMENT	Num Enrolled	13%	13%	13%	13%	13%
<i>CLASS PREP</i>	Credit Hrs/Num Enrolled	<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>
<i>INSTRUCTION</i>	Credit Hrs/Num Enrolled	<i>32%</i>	<i>32%</i>	<i>32%</i>	<i>32%</i>	<i>32%</i>
REASEARCH/GRANT DEV	Num Enrolled	19%	19%	19%	19%	19%
STUDENT SUPPORT	Num Enrolled	16%	16%	16%	16%	16%
IT MGMT For Business	IT Work Orders	Volume Driven	Volume Driven	Volume Driven	Volume Driven	Volume Driven
Facilities Management	Square Foot	Volume Driven	Volume Driven	Volume Driven	Volume Driven	Volume Driven

Cost Flow Summary Results

	Accounting	% IDC	Marketing	% IDC	Economic	% IDC	Entrepreneurship	% IDC	PhD in Bus. Administration	% IDC
ACADEMIC IMPROVEMENT	\$29,733.39	3%	\$5,121.71	1%	\$143,507.23	4%	\$47,261.67	6%	\$51,686.16	7%
<i>CLASS PREP</i>	<i>\$135,443.30</i>	15%	\$20,245.82	4%	<i>\$895,284.25</i>	25%	<i>\$72,710.26</i>	9%	<i>\$79,517.17</i>	10%
<i>INSTRUCTION</i>	<i>\$254,984.08</i>	28%	\$37,246.47	7%	<i>\$1,711,799.52</i>	48%	<i>\$116,336.42</i>	15%	<i>\$127,227.47</i>	16%
REASEARCH/GRANT DEV	\$43,456.49	5%	\$7,485.56	1%	\$209,741.34	6%	\$69,074.75	9%	\$75,541.31	10%
STUDENT SUPPORT	\$39,425.25	4%	\$6,588.89	1%	\$195,185.53	5%	\$58,168.21	8%	\$63,613.74	8%
<i>IT MGMT</i>	<i>\$384,079.08</i>	42%	<i>\$384,079.08</i>	72%	<i>\$384,079.08</i>	11%	<i>\$384,079.08</i>	50%	<i>\$384,079.08</i>	49%
<i>Facilities MGMT</i>	<i>\$36,728.40</i>	4%	<i>\$74,641.00</i>	14%	\$41,319.45	1%	\$19,993.28	3%	\$6,220.13	1%
Total Indirect Cost	\$923,849.99	100%	\$535,408.53	100%	\$3,580,916.40	100%	\$767,623.67	100%	\$787,885.06	100%

College of Business - Performance Metrics

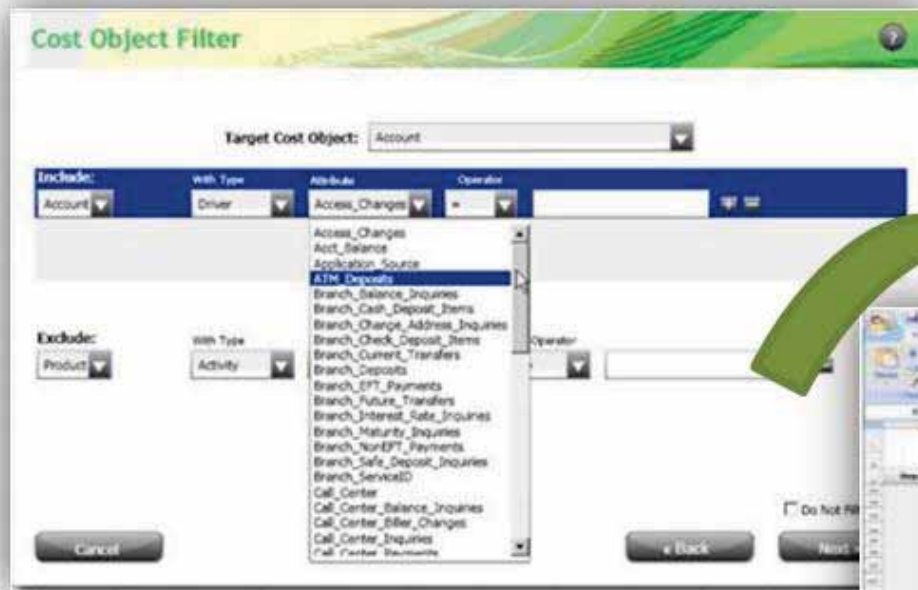
Student /Faculty and cost ratios highlight potential efficiency opportunities in four of the five College of Business departments. A closer look into the key drivers of the direct and shared service costs associated to these departments will provide us the needed information to develop a clear plan to meet industry benchmark standards.

College of Business “Fully Loaded” Performance Metrics

COB Metrics	Accounting	Marketing	Economics	Entrepreneurship	PhD in Bus. Administration	COB - Fall 2008
Number of Students	248.00	504.00	279.00	135.00	42.00	1,208.00
Number of Faculty	20.00	26.00	23.00	7.00	1.00	69.00
Student/Faculty Ratio	12.40	19.38	12.13	19.29	42.00	14.94
Total Square Foot	2,480.00	5,040.00	2,790.00	1,350.00	420.00	12,080.00
Cost/Student	\$ 3,725.20	\$ 1,062.32	\$ 12,834.83	\$ 5,686.10	\$ 18,759.17	\$ 5,460.00
Cost/Faculty	\$ 46,192.50	\$ 20,592.64	\$ 155,692.02	\$ 109,660.52	\$ 787,885.06	\$ 95,589.62
Cost/Sq Foot	\$ 372.52	\$ 106.23	\$ 1,283.48	\$ 568.61	\$ 1,875.92	\$ 546.00
Total Indirect Cost	\$923,849.99	\$535,408.53	\$3,580,916.40	\$767,623.67	\$787,885.06	\$6,595,683.65

OPS Executive Summary

- Driver based budgeting utilizing actual calculated model results
- Allows users to see cost and capacity utilization effects of proposed operational changes



Excel Based Simulations

A screenshot of an Excel spreadsheet titled "Acorn Systems Business Modeling". The spreadsheet displays a complex financial model with multiple columns and rows. A green arrow points from the "Cost Object Filter" dialog box to a specific cell in the spreadsheet, indicating a data flow or integration. The spreadsheet includes various financial metrics and is organized into sections.

Simulation and Planning Wizard

OPS Simulation Summary

Simulation #	Actual Cost	Simulated Cost	% Variable	Est. Cost Savings
1	\$ 119,268.94	\$ 85,873.64	65%	\$ 21,706.95
2	\$ 1,314,081.58	\$ 946,138.74	55%	\$ 202,368.56
3	\$ 39,221.63	\$ 28,239.15	41%	\$ 4,502.82
4	\$ 98,094.02	\$ 70,627.69	41%	\$ 11,261.20
5	\$ 69,416.69	\$ 49,980.02	41%	\$ 7,969.03
6	\$ 220,518.48	\$ 158,773.31	22%	\$ 13,583.94
7	\$ 127,957.00	\$ 92,129.04	22%	\$ 7,882.15
8	\$ 200,229.01	\$ 144,164.89	22%	\$ 12,334.11
9	\$ 2,188,787.35	\$ 1,575,926.48	39%	\$ 281,608.75

- Over \$280K in cost savings have been identified by running a few simulations *just within* the College of Business !!!
- IT Management can be simulated by IT work order category *and* further by academic department.
- Over 90 distinct simulations that can be analyzed *within* the College of Business
- Over 30,000 distinct simulations available throughout the University
- Savings identified with college of business can be extrapolate across other departments, suggesting savings of \$4.7 Million!
- We are only included variable cost savings. Salaries are currently considered fixed and are not included!

OPS Simulation #2 - Econ, Finance, and Gen. Bus - Class Instruction

Equation: $\text{if}(\text{DEPT_ID}=="\text{EGBF}",1,0)*20*\text{CREDIT_HRS}*\text{if}(\text{NUM_ENROLLED}>20,1.25,1)$

Activity	Driver		Totals	SC_FY2008	Actuals	SC_FY2008	Actuals	Variance
Economics, Finance And Gen Bus - 210030 - INSTRUCTION	CREDIT_HRS	Wgt/Time	102.00	102.00	102.00	91.80	102.00	-10.20
		Standard:						
		Volume	2,445.00	2,445.00	2,445.00	1,760.40	2,445.00	-684.60
		Time	20.00					
		Cost	\$1,314,081.58	\$1,314,081.58	\$1,314,081.58	\$946,138.74	\$1,314,081.58	-\$367,942.84
		Fixed	\$582,690.05	\$582,690.05	\$582,690.05	\$419,536.84	\$582,690.05	-\$163,153.22
		None	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	Variable	\$731,391.53	\$731,391.53	\$731,391.53	\$526,601.90	\$731,391.53	-\$204,789.63	
	Cost Per Driver	\$12,883.15	\$12,883.15	\$12,883.15	\$10,306.52	\$12,883.15	-\$2,576.63	
	Total Modeled Time		2,445.00	2,445.00	2,445.00	1,760.40	2,445.00	-684.60
	Total Modeled Cost		\$1,314,081.58	\$1,314,081.58	\$1,314,081.58	\$946,138.74	\$1,314,081.58	-\$367,942.84
	Available HeadCount		1.54	1.54	1.54	1.19	1.54	-0.35
	Consumed HeadCount		2.45	2.45	2.45	1.76	2.45	-0.68
Cost Per HeadCount		\$855,899.76	\$855,899.76	855,899.76	\$797,028.91	855,899.76	-58,870.85	
HeadCount Utilization		159.25%	159.25%	159.25%	148.30%	159.25%	-10.95%	

Simulation #	Department/Activity	Cost Driver	Actuals Weighting(Time)	Actuals Volume	Simulation (W) - 20% (V) - 10% Weighting(Time)	Simulation Volume
2	Econ- Class Instruction	Credit Hours	20	102	16	91.8

Simulation #	Actual Cost	Simulated Cost	% Variable	Est. Cost Savings
2	1314081.58	946138.74	55%	\$ 202,368.56

OPS Simulation #4 – IT MGT: PC Repair - Marketing

Equation: if(left([Academic_Department].[ID],4)="MKTG",1,0)*((1*[Academic_Department].[IT_CopierInstallation]) + (.3*[Academic_Department].[IT_EmailTroubleshooting]) + (.5*[Academic_Department].[IT_InternetConnectionRepair]) + (.75*[Academic_Department].[IT_NewPhone]) + (1*[Academic_Department].[IT_PCRepairs]) + (.75*[Academic_Department].[IT_PhoneRepair]) + (.3*[Academic_Department].[IT_PrinterConnections]) + (1*[Academic_Department].[IT_SoftwareInstallations]) + (1*[Academic_Department].[IT_VirusRemovals]) + (.5*[Academic_Department].[IT_WebsiteMaintenance]))

Activity	Driver		Totals	SC_FY2008	Actuals	Variance	SC_FY2008	Actuals	Variance
Marketing - 210060 - IT MGMT	IT_PCRepairs	Wgt/Time	Volume	368.40	368.40	368.40	0.00	368.40	-36.84
		Standard:	Time	39.59	39.59	39.59	0.00	39.59	-11.08
		1.00	Cost	\$98,094.02	\$98,094.02	\$98,094.02	\$0.00	\$70,627.69	-\$27,466.32
			Fixed	\$56,941.61	\$56,941.61	\$56,941.61	\$0.00	\$40,997.96	-\$15,943.65
			None	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
			Variable	\$41,152.40	\$41,152.40	\$41,152.40	\$0.00	\$29,629.73	-\$11,522.67
		Cost Per Driver	\$266.27	\$266.27	\$266.27	\$0.00	\$213.02	-\$53.25	
	IT_PhoneRepair	Wgt/Time	Volume	304.50	304.50	304.50	0.00	304.50	0.00
		Standard:	Time	24.54	24.54	24.54	0.00	24.54	0.00
		0.75	Cost	\$60,809.50	\$60,809.50	\$60,809.50	\$0.00	\$60,809.50	\$0.00
		Cost Per Driver	\$199.70	\$199.70	\$199.70	\$0.00	\$199.70	\$0.00	
Total Modeled Time			155.01	155.01	155.01	0.00	143.92	155.01	-11.08
Total Modeled Cost			\$384,079.08	\$384,079.08	\$384,079.08	\$0.00	\$356,612.75	\$384,079.08	-\$27,466.32

Simulation #	Department/Activity	Cost Driver	Weighting	Actuals Volume	Simulation (W) - 20% (V) - 10% Weighting	Volume
4	IT MGT: PC Repair - Marketing	PC Repairs	1	368.4	0.8	331.56

Simulation #	Actual Cost	Simulated Cost	% Variable	Est. Cost Savings
4	\$ 98,094.02	\$ 70,627.69	41%	\$ 11,261.20



OPS Simulation #6 – Facilities MGT - Marketing

Equation: $.60 * [\text{Class}].[\text{NUM_ENROLLED}]$

Activity	Driver		Totals	SC_FY2008	Actuals	SC_FY2008	Actuals	Variance	
	Wgt/Time Standard:	Volume							
Facility MGMT	NUM_ENROLLED		1,340.10	1,489.00	1,489.00	1,340.10	1,489.00	-148.90	
			643.25	893.40	893.40	643.25	893.40	-250.15	
		0.48	Cost	\$158,773.31	\$220,518.49	\$220,518.49	\$158,773.31	\$220,518.49	-\$61,745.18
			Fixed	\$122,954.05	\$170,769.52	\$170,769.52	\$122,954.05	\$170,769.52	-\$47,815.46
			None	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
			Variable	\$35,819.26	\$49,748.97	\$49,748.97	\$35,819.26	\$49,748.97	-\$13,929.71
			Cost Per Driver	\$118.48	\$148.10	\$148.10	\$118.48	\$148.10	-\$29.62
			Total Modeled Time	643.25	893.40	893.40	643.25	893.40	-250.15
			Total Modeled Cost	\$158,773.31	\$220,518.49	\$220,518.49	\$158,773.31	\$220,518.49	-\$61,745.18

Simulation #	Department/Activity	Cost Driver	Actuals Weighting(Time)	Actuals Volume	Simulation (W) - 20% (V) - 10% Weighting(Time)	Simulation (W) - 20% (V) - 10% Volume
6	FAC MGT- Marketing	Num Enrolled	0.6	1489	0.48	1340.1

Simulation #	Actual Cost	Simulated Cost	% Variable	Est. Cost Savings
6	\$ 220,518.48	\$ 158,773.31	22%	\$ 13,583.94

OPS Simulation Summary

Simulation #	Actual Cost	Simulated Cost	% Variable	Est. Cost Savings
1	\$ 119,268.94	\$ 85,873.64	65%	\$ 21,706.95
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- Over \$280K in cost savings have been identified by running a few simulations *just within* the College of Business !!!
- IT Management can be simulated by IT work order category *and* further by academic department.
- Over 90 distinct simulations that can be analyzed *within* the College of Business
- Over 30,000 distinct simulations available throughout the University.

Next Steps

Next Focus Are High Cost Depts →

Department	XXXYYZZ - Fall 2008
Educational Found & Leadership	(\$3,583,760.17)
Biology	(\$1,604,869.37)
Chemistry	(\$1,452,781.93)
Physics, Atmospheric & Geo Sci	(\$1,039,796.73)
Psychology	(\$1,013,009.54)
Accounting	(\$925,993.00)
Economics, Finance & Gen Bus	(\$828,239.05)
Public Policy & Administration	(\$601,806.94)
Urban & Regional Planning	(\$554,621.66)
Management & Marketing	(\$513,290.42)
Bottom 10 Total	(\$12,118,168.81)

Initial Focus is College of Business

- Over \$280K in cost savings have been identified by running a few simulations *just within* the College of Business !!!
- Savings identified with college of business can be extrapolate across other departments, suggesting savings of \$4.7 Million!
- We are only included variable cost savings. Salaries are currently considered fixed and are not included!
- Next step is to target other high cost departments, use OPS and strategize conservative changes to be made

Next Steps

- Identify master list of opportunity areas (other colleges, departments, and processes)
- Develop potential thresholds for changes that can realistically be made
 - 20% improvement in efficiency (reduction in equation driver coefficients)
 - 10% reduction in driver volume
 - 20% reduction in cost
 - 10% reduction in staff levels
- Summarize results and impact
- Collaborate with University personnel to implement change