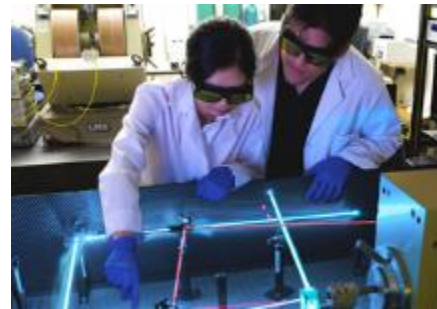
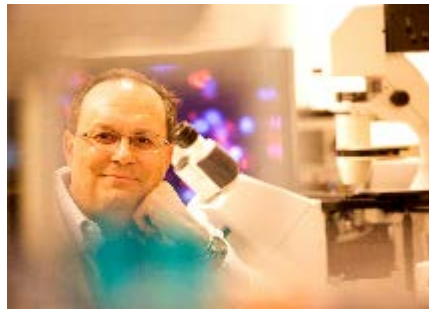




ABC (Activity Based Costing) and Course Optimization Project Kick-off

July 2015



Project Observers & Partners

Partners

BILL & MELINDA
GATES *foundation*



UCOP



Deloitte.

Pilbara

Observers

UNIVERSITY OF CALIFORNIA
UCMERCED

UCDAVIS
UNIVERSITY OF CALIFORNIA

Berkeley
UNIVERSITY OF CALIFORNIA



UNIVERSITY
INNOVATION
ALLIANCE



Purpose of Project

Empower academic leaders, deans,
department chairs and faculty members
with the analytical tools required
to innovate and redesign individual courses and/or
to optimize college course portfolios
to ***improve student success.***



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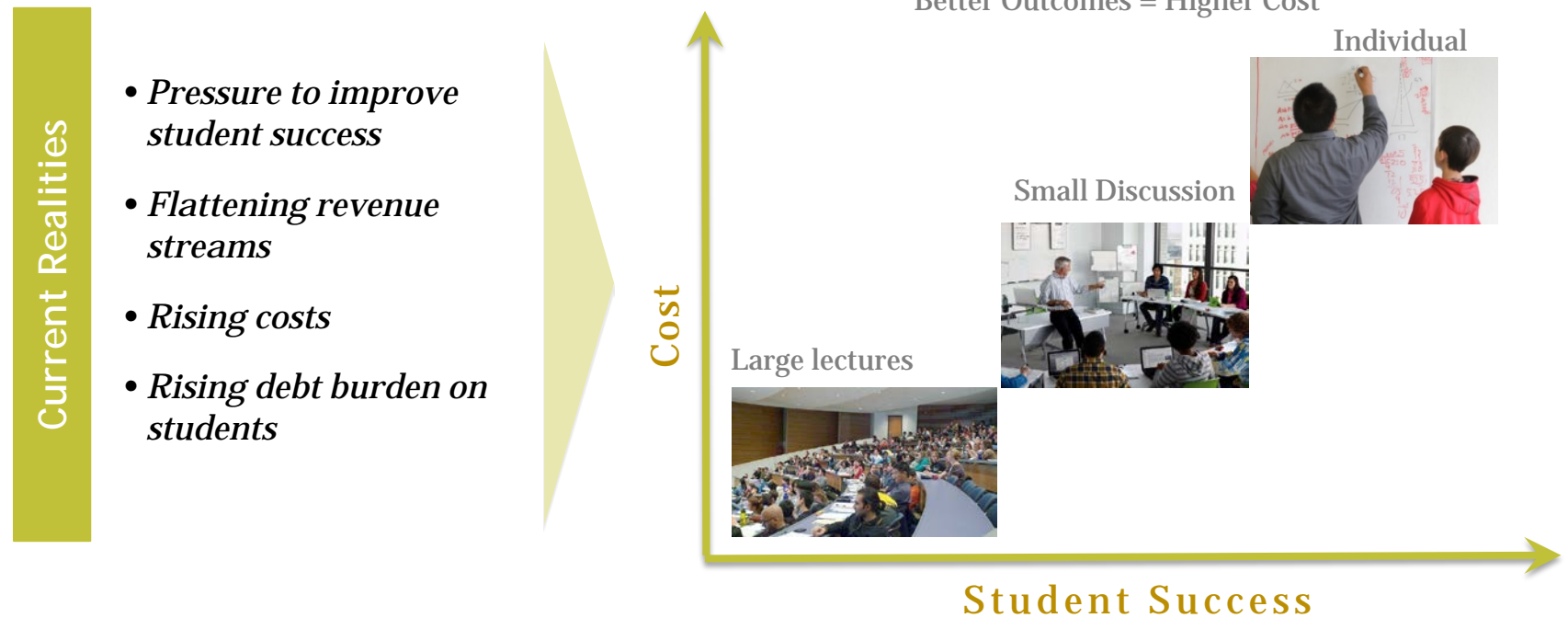


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Current Context:

The current national environment demands innovation to support student success and delivery of UCR's goals of Research, Access, Diversity and Engagement.

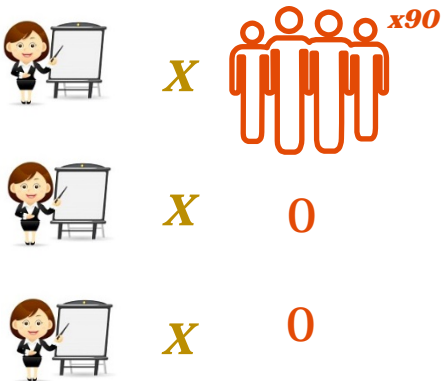


How do we create the tools to improve student success AND contain costs?

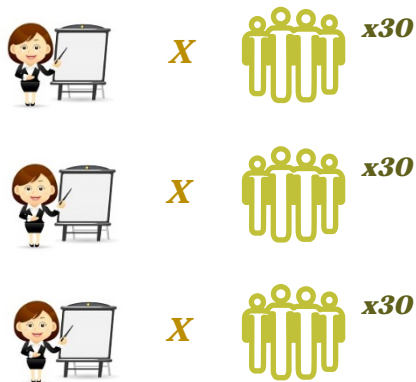
Current data systems do not capture the information needed to answer strategic management questions

Given a fixed budget, what is the optimal mix for achieving the highest level of student success?

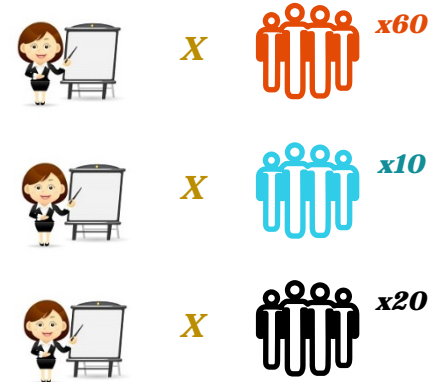
Scenario A



Scenario B



Scenario C



?



Why cost matters to education innovators...

New learning methodologies are treated as one-off initiative expenses, not as part of a change in the operating model, making it difficult to effectively scale innovation

“Undergraduates can get ‘turned off’ in introductory science courses and never sign up for another one.



For students to understand and become energized about science, they need to first participate in the discovery process.”

—Susan Wessler

Creator: *Dynamic Genome Course*

Dynamic Genome Course :

- Sections: 12 /yr with proposed 24/yr in 5 years
- **Undergraduates: 288 to increase to 576 in 5 year**

Improved Outcomes:

- Increased confidence in research skills and application
- Increased student participation
- Increased student retention in STEM fields

Cost Related Questions:

- Does it cost more or less than other science courses?
- How much would it cost to replicate this course?

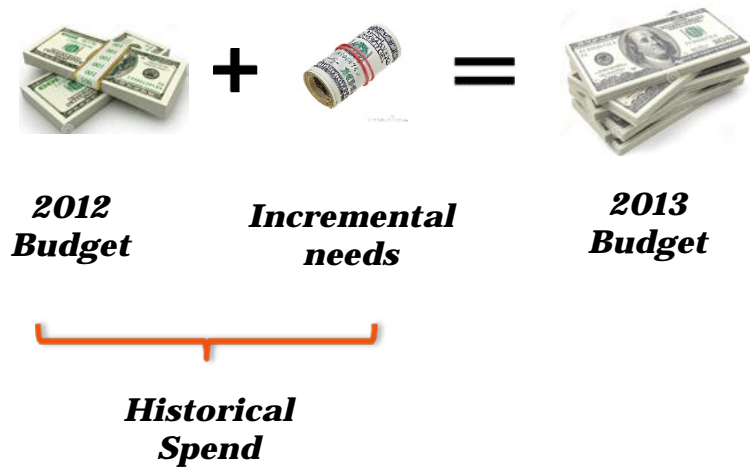


Today we **do not have the information to answer these questions.**



New Budget Model: New Incentives

Past: Incremental Budget Design



Future: Incentive-Based Budget Model

- *Student Credit Hours*
- *Major*
- *Graduation Rates*



Tuition Revenue to Colleges



- *Academic Salaries & Benefits*
- *Staff Salaries & Benefits*
- *Research*



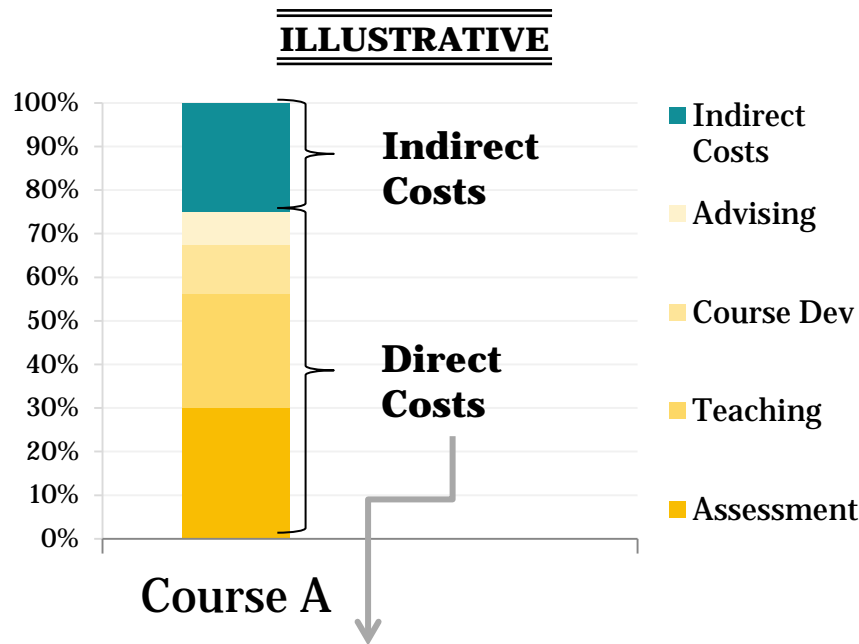
Expense

UCR's new budget model empowers Deans to spend their revenue on their highest priorities.

Proposed methodology combines cost allocation with activity-based costing

Captures both the fully loaded class cost and the cost of discrete educational activities

Sample Course Expense Report



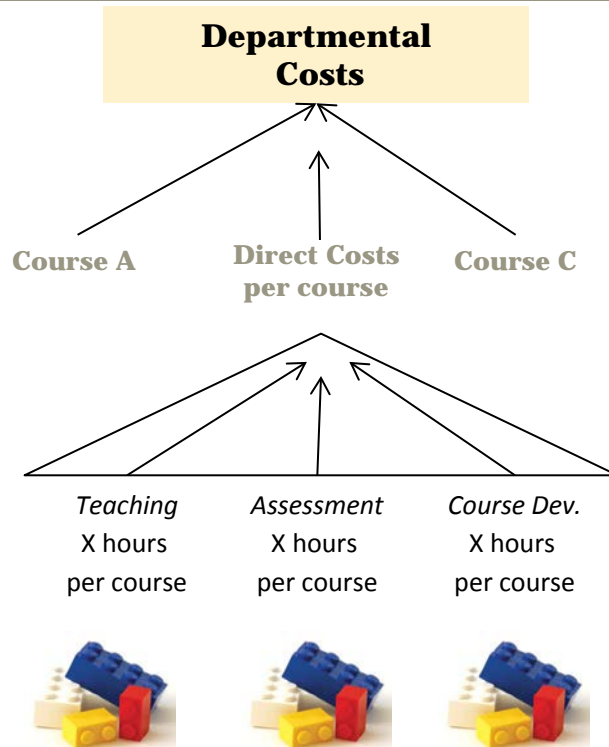
“Fully-loaded” cost data provides a tool for academic and planning administrators to evaluate departmental and program costs and inform decision-making

Activity-Based Costing:
Course level activity data allows for innovation and improvement of the educational delivery function

Why is this unique? A paradigm shift

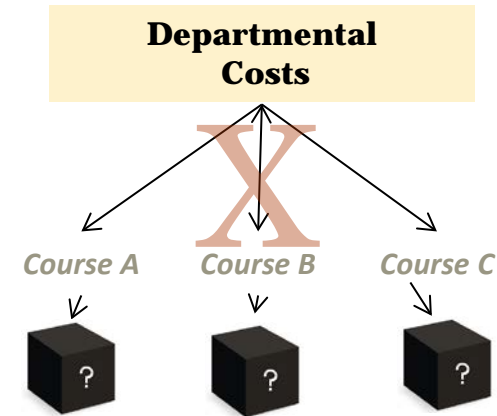
The direct costs should roll-up and not be allocated down for fruitful analysis

Activity-Based Course Costing



Capturing costs from grass-root activities and rolling them up is the only way for institutions to compare the costs of different course delivery design methodologies

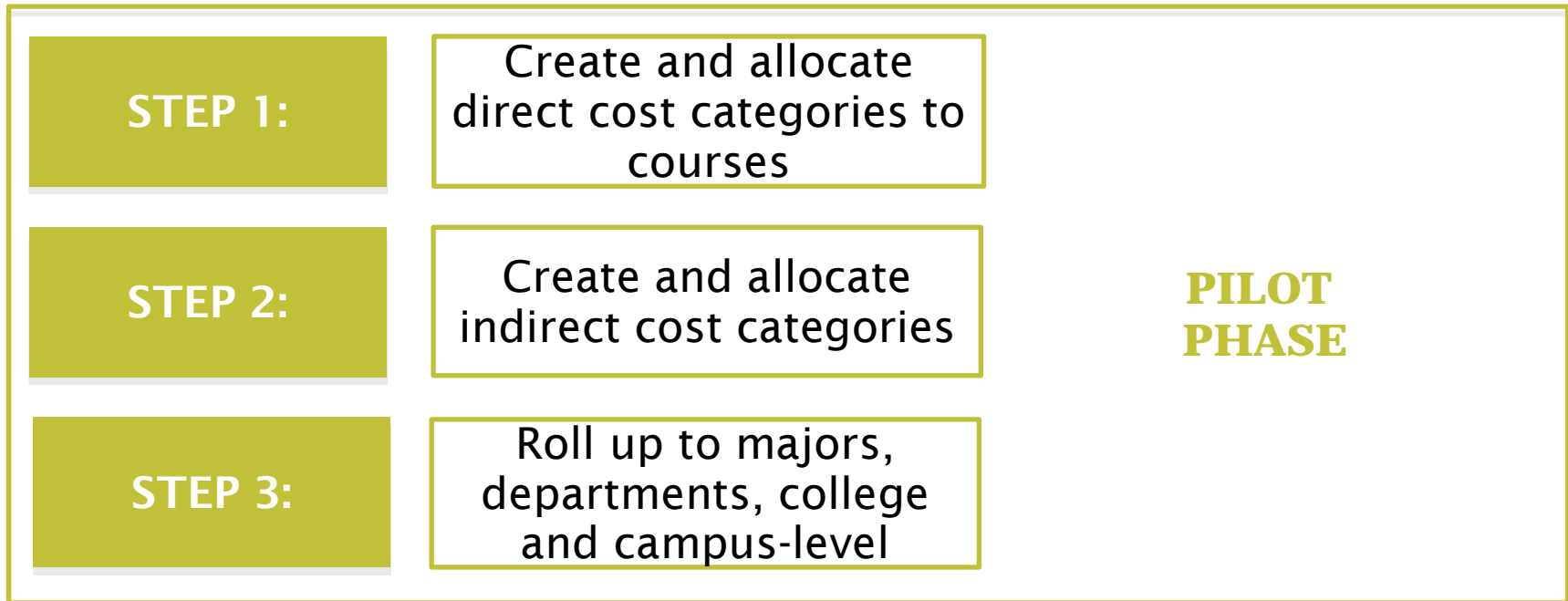
Current Education Costing Methodologies



“With cost preceding rather than following activity, departmental production as a function becomes fixed rather than variable and the activity itself is assumed to be beyond analysis”

– Massy, 2003

How will this be done? By understanding our current cost structure



First Step in Direct Cost Allocation: Course Profiles

- In order to allocate costs to the educational activities, course profiles will be created to allocate activity hours and attributes to its courses

| Sample Course Profile | | |
|------------------------|----------------------|-----------------------------|
| Educational Activities | Course Development | Hours |
| | Course Management | Hours |
| | Teaching | Hours |
| | Tutoring | Hours |
| | Advising | Hours |
| | Assessment & Grading | Hours |
| Course Attributes | Class Type | Lecture/Lab/etc |
| | Credit Hours | |
| | Delivery Mode | On-campus Online/ Hybrid |
| | Semester | Fall/Summer |
| | # of Students | |

- Effort on course activities can be captured in “course profiles” – minimizes interviews & effort
- Can be set to differ by school/department, by level/type of course or individual
- Can refine as appropriate over time
- Attributes can be added to course profiles to give more information
- Note that in Excel these would create unmanageable data sets, but DS software can handle this complexity

Benefits of Methodology

Management Tool for Deans and Department Chairs

Improves Resource Allocation Capabilities

- Enable ongoing tool to assess impact of various resource allocation methodologies
- Quantifies the level of cross-subsidization throughout the college allowing explicit evaluation of these decisions

Improves Ability to do Planning & Forecasting

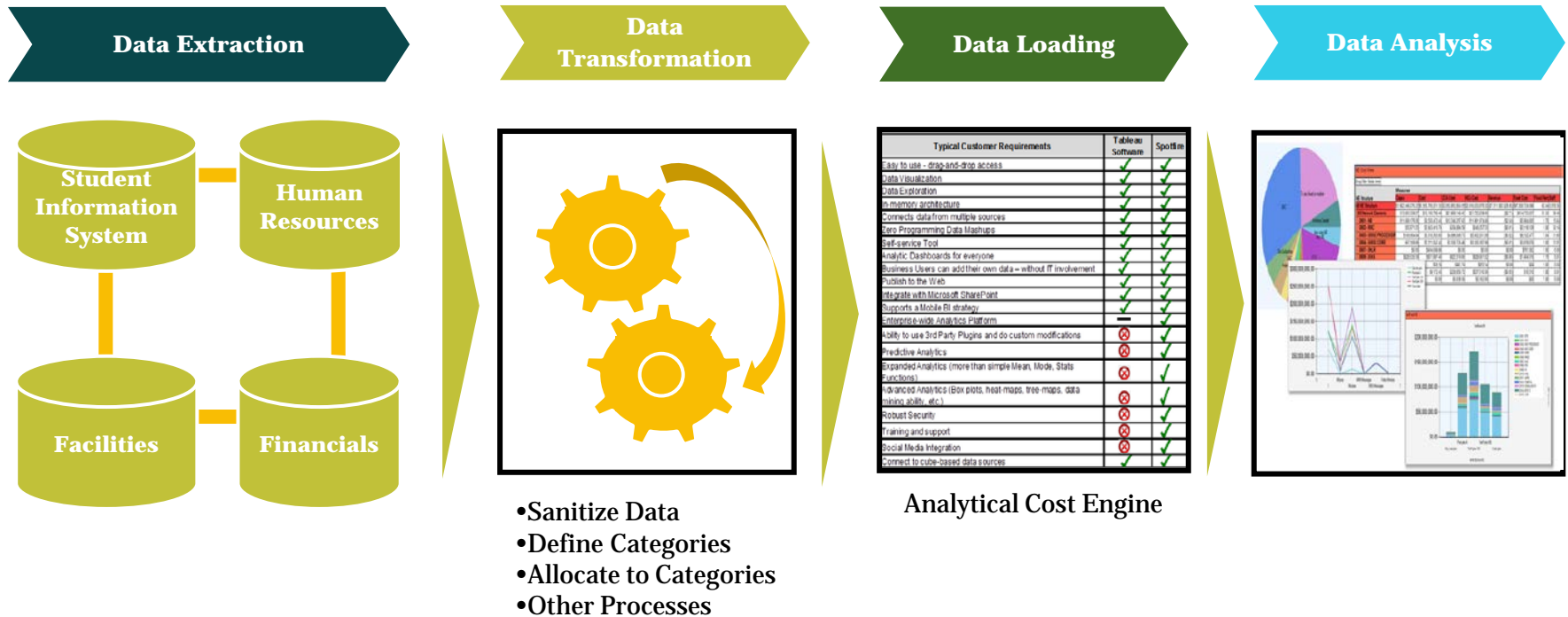
- Ability to run planning scenarios based on different strategic choices
- Informs student enrollment management and programmatic changes

Course Improvement Tool for Our Faculty Members

- Allows analysis and improvement of instructional model
- Illustrates and validates assumptions around course development/delivery
- Provides actionable data regarding the costs to achieve desired educational outcomes

Overall Approach: Technical Design

The technical approach consists of data extraction, transformation and loading. Data definition, categorization and transformation is the key.



Project Outputs

Technology Deliverables

- Reporting cubes reflecting GL and HR data
- Reporting cubes reflecting Programs, Courses and Facilities
- Defined set of Course activities
- Defined set of Course attributes
- Compiled results from academic pilot

Knowledge Dissemination Documentation

- Executive Summary
- Implementation Guidance
- Tools & Techniques for successful outcomes
- Lessons Learned documentation

Project Timeline

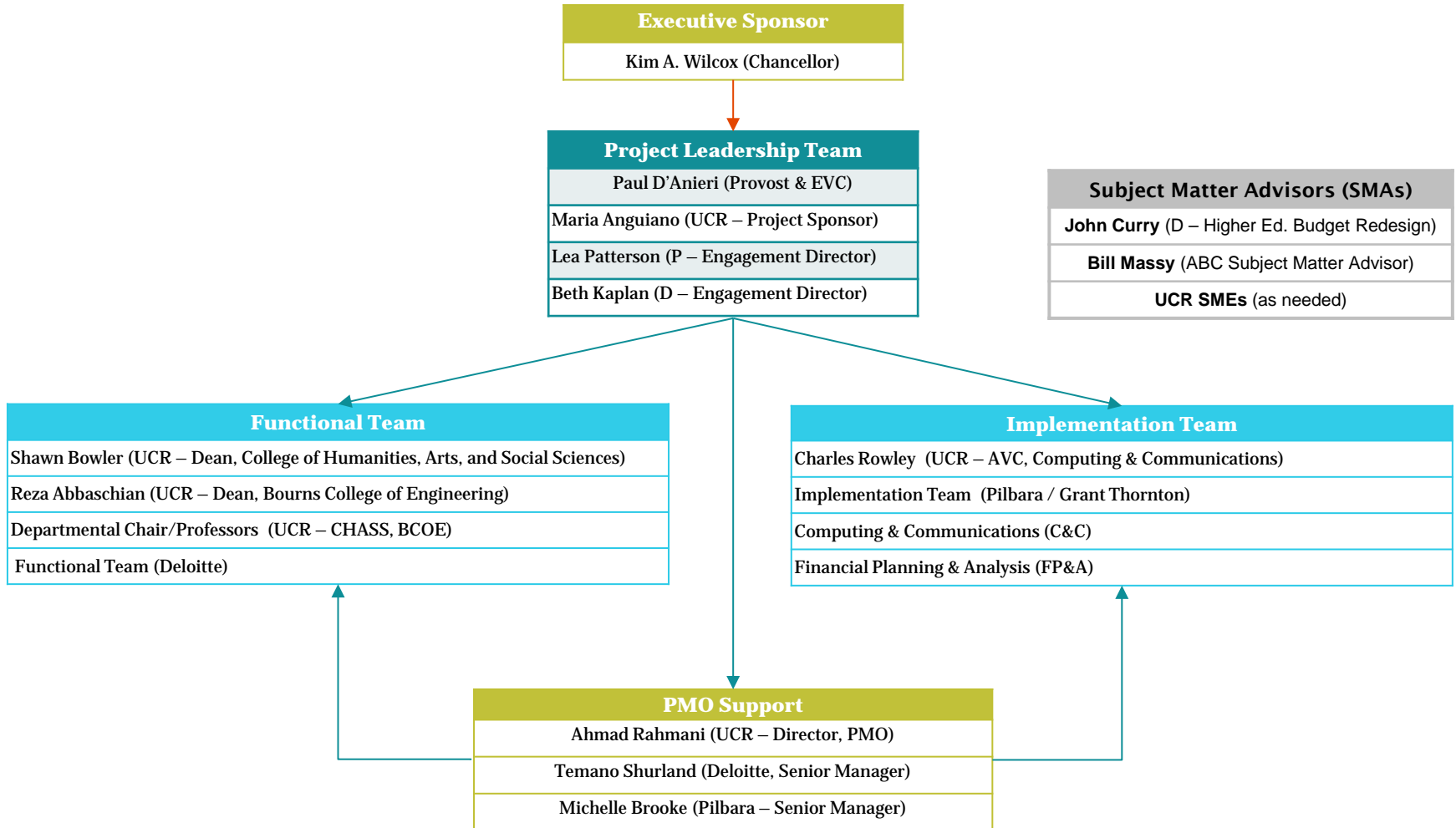
The following is high-level timeline overview of activities envisioned to complete by the end of December, 2015.

| Administrative Implementation | Activities | Jul | | Aug | | | | Sep | | | | Oct | | | | Nov | | | | Dec | | | |
|--|------------|------------------------------------|---|-----|---|---|---|-----|---|---|----|-----|----|----|----|-----|----|----|----|-----|----|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | | Scoping & Analysis of requirements | | | | ◆ | | | | | | | | | | | | | | | | | |
| Design & Build GL and HR Module | | | | | | | | | ◆ | | | | | | | | | | | | | | |
| Design & Build Program, Course and Facilities Module | | | | | | | | | | | | | | ◆ | | | | | | | | | |
| Verify and Validate the Model | | | | | | | | | | | | | | | | | | ◆ | | | | | |
| Model Approval and Roll-Out | | | | | | | | | | | | | | | | | | | | ◆ | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|----------------|-----------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Academic Pilot | Pilot Planning | | | | | | | | | | | | | | | | | | | | | |
| | Study Design & Development | | | | | | | | | | | | | | | | | | | | | |
| | Study Analysis | | | | | | | | | | | | | | | | | | | | | |
| | Model Modification & Update | | | | | | | | | | | | | | | | | | | | | |
| | Pilot Approval and Roll-Out | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Knowledge Docs | Develop Business Case for ABC adoption | | | | | | | | | | | | | | | | | | | | | |
| | Develop Point of View document (Whitepaper) | | | | | | | | | | | | | | | | | | | | | |
| | Develop Implementation Roadmap | | | | | | | | | | | | | | | | | | | | | |

Project Team & Structure

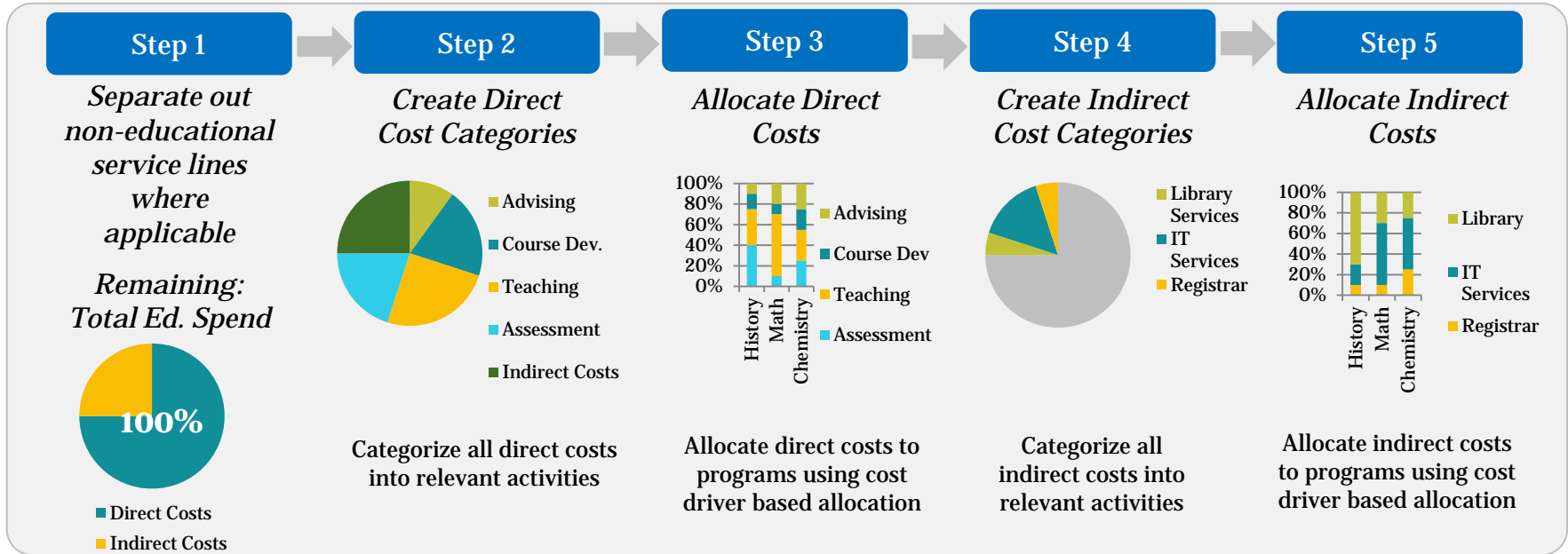


Appendix

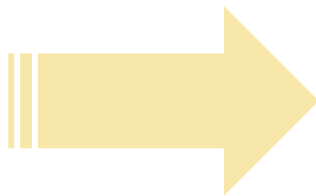
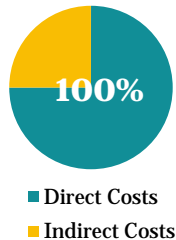
Cost Structure: What does it mean?

Cost structure deconstructs an institution's total cost of doing business; it is a comprehensive analysis of all the cost elements it takes to **exist**.

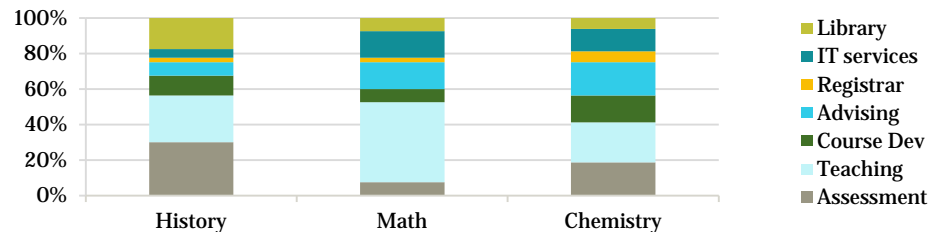
ILLUSTRATIVE



TOTAL SPEND



NEW TOTAL SPEND



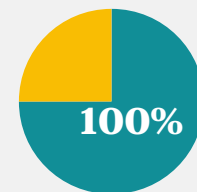
Cost Structure: Step 1

- Many types of higher education institutions can be considered multi-product firms because they produce a variety of things, not just education
- Educational enterprise must be separated from the business-like, self-supporting set of service lines, where costs should be covered by revenues and thus should be irrelevant to the cost per course
 - Examples include: auxiliaries, clinics, technology transfer, and externally funded research

Step 1

Separate out non-educational service lines where applicable

Remaining Total Educational Spend




■ Direct Costs
■ Indirect Costs

Cost Structure: Step 2

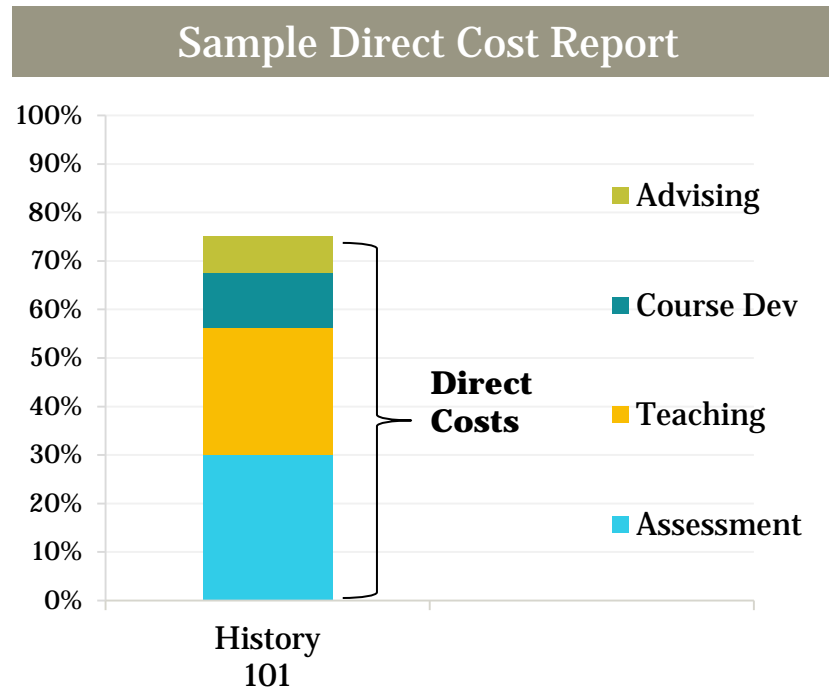
Step 2

Create Direct Cost Categories



- Advising
- Course Dev.
- Teaching
- Assessment
- Indirect Costs

Categorize all direct costs into relevant activities



- Institutions have to break down courses by meaningful educational activity categories
- Institutions should use the same educational activities for all course types. Other information can be added in as an attribute using cost allocation software: Type of course, type of instruction (remedial or credit courses), etc.

Direct Cost Activities: In order to create more standardization across the sector, recommendation is for institutions to use buckets created by NHEBI

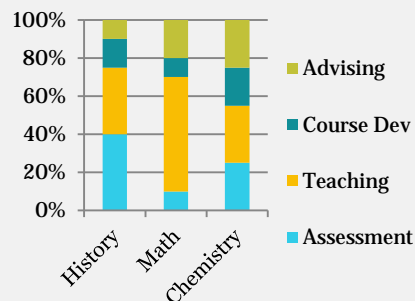
Institutions should use the same educational activities for all course types. Other information can be added in as an attribute using the cost allocation software (type of course, type of instruction (remedial or credit courses) or even student type).

| Direct Activities* | Description* |
|---------------------------|--|
| 1 Course Development | Creating and planning curriculum, pedagogy, instruction, and delivery methods to guide student learning. |
| 2 Course Management | Planning learning activities, selecting and creating course content and materials, engaging in course organization. |
| 3 Teaching | Delivering course content, managing and monitoring student assignments and classroom (physical or virtual) activities. |
| 4 Tutoring | Formally providing supplemental academic assistance in support of regular coursework. |
| 5 Advising | Assisting students with activities related to their educational experience including scheduling, academic support, planning and selecting curricular pathways and career development. |
| 6 Assessment and Grading | Assessing prior and current learning; developing and selecting assessment methodologies; evaluating student assignments and performance to award course credit, and contributing to broader assessment of student learning outcomes. |

Cost Structure: Step 3

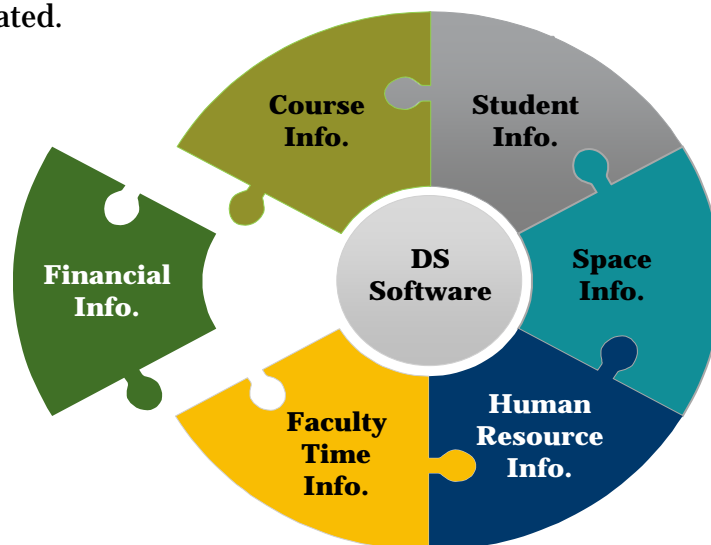
Step 3

Allocate Direct Costs



Allocate direct costs to programs using cost driver based allocation

- The task required is NOT the allocation of total departmental costs to each activity, but rather to start with estimates on the time it takes to complete any given activity
- Cost allocation calculation requires a wide variety of information, **financial information is just one piece of the puzzle**
- Complex task, but decision support software and use of a variety of non-financial data from institution allows cost allocation to be more practical than in the past and for it to be fairly automated.
- Good data is **KEY**



Understanding the Information Puzzle

Financial

- Account Information (Revenue & Expense)
- Dept./Cost Center
- Fund info.

Course

- Course name & #
- School/Department
- Room (Location)
- # students enrolled

Space & Location

- Building or #
- # of rooms per building
- Room type (e.g. lab)
- Square footage
- Capacity

Payroll/HR

- Employee Type
- Function
- Salary & Fringe
- Home Department

Student Records

- Student Type
- Student number
- Major
- Course enrollment

Faculty Workload

- Type
- Time Estimates
- Salary & Fringe
- Department

First Step in Direct Cost Allocation: Course Profiles

In order to allocate costs to the educational activities, institutions could create course profiles to allocate activity hours and attributes to its courses

- Effort on course activities can be captured in “course profiles” – minimizes interviews & effort
- Can be set to differ by school/department, by level/type of course or individual
- Can refine as appropriate over time

- Attributes can be added to course profiles to give more information
- Note that in Excel these would create unmanageable data sets, but Decision Support software can handle this complexity

Sample Course Profile

| | | |
|------------------------|----------------------|-------|
| Educational Activities | Course Development | Hours |
| | Course Management | Hours |
| | Teaching | Hours |
| | Tutoring | Hours |
| | Advising | Hours |
| | Assessment & Grading | Hours |

| | | |
|-------------------|---------------|-----------------------------|
| Course Attributes | Class Type | Lecture/Lab/etc |
| | Credit Hours | |
| | Delivery Mode | On-campus Online/ Hybrid |
| | Semester | Fall/Summer |
| | # of Students | |

Second Step – Combine with Financial Data

Once educational activities & hours for each are identified: Costs per hour can be allocated. Can calculate by course and roll up by school/department

Sample Course Cost With Instructional Breakdown

School of Business

Course 1

| | Hours | % Total | Expense | Faculty FTE | FT Students |
|----------------------|-------|---------|-------------|-------------|-------------|
| Course Development | Hours | 10% | \$\$\$ | XX | XX |
| Course Management | Hours | 20% | \$\$\$ | XX | XX |
| Teaching | Hours | 40% | \$\$\$ | XX | XX |
| Tutoring | Hours | 20% | \$\$\$ | XX | XX |
| Advising | Hours | 10% | \$\$\$ | XX | XX |
| Assessment & Grading | Hours | 10% | \$\$\$ | XX | XX |
| Total | | | \$\$ | | |

Course 1

School of Liberal Arts

School of Medicine

School of Engineering

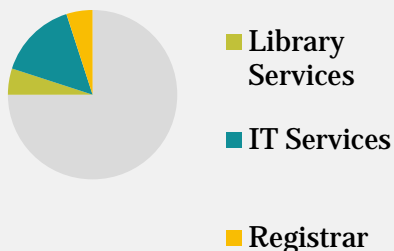
Activity hours are combined with HR/financial data to calculate per course expenses

Non-financial information can be included to create specific metrics

Cost Structure: Step 4

Step 4

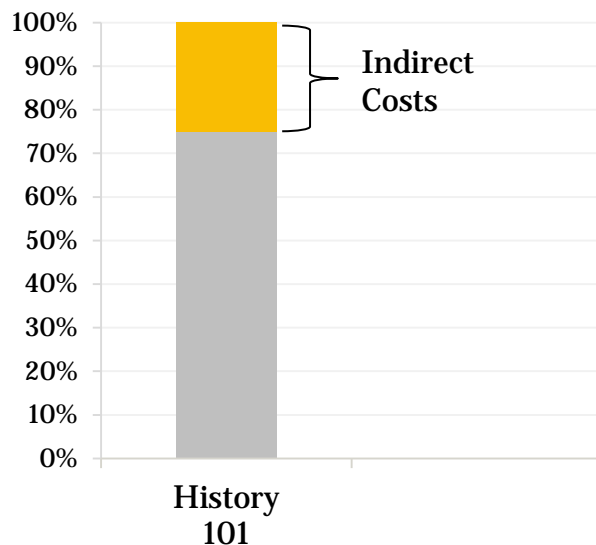
Create Indirect Cost Categories



Categorize all indirect costs into relevant activities

Sample Course Expense Report

ILLUSTRATIVE



- Only direct costs are needed for course redesign work
- However, from an institution-wide perspective, all costs should be allocated to calculate the **fully loaded cost** of providing students with instruction

- Indirect costs should not be distributed evenly across courses, assuming they are evenly distributed among all courses
- Different costs have different cost drivers and any cost allocation methodology must acknowledge these differences.

Indirect Cost Categories & Activities

*These categories allow the institution to **group high level categories of expenses** as well as the **flexibility to analyze** the specific activities within each category type*

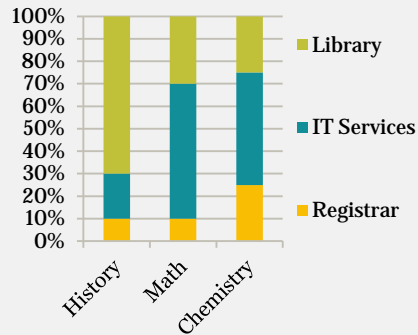
| Type of Expense | Activity | Type of Expense | Activity |
|--|--------------------------------------|--------------------------|--|
| College or Departmental Overhead | Academic Administration | Student Services* | Admissions (includes marketing/recruiting) |
| | Other Administration | | Advising |
| | Facilities & Space | | Tutoring |
| | Other Expenses | | Counseling |
| Academic Overhead/ Academic Support | Academic Administration | | Career Services |
| | Faculty Development | | Student Assessment/Testing |
| | Information Technology | | Financial Aid Admin. |
| | Library Services | | Student Support IT |
| | Facilities & Space | | Other Student Activities |
| | Other Academic Support | | |
| | Executive Management | | |
| Institutional Overhead | Administration (HR/IT/Finance/Legal) | | |
| | Alumni/Development | | |
| | Facilities & Space | | |
| | Other Institutional Overhead | | |

**All Student Service category definitions are attributable to IHEP (Institute for Higher Education Policy) recent activity based costing project sponsored by the Bill and Melinda Gates Foundation*

Cost Structure: Step 5

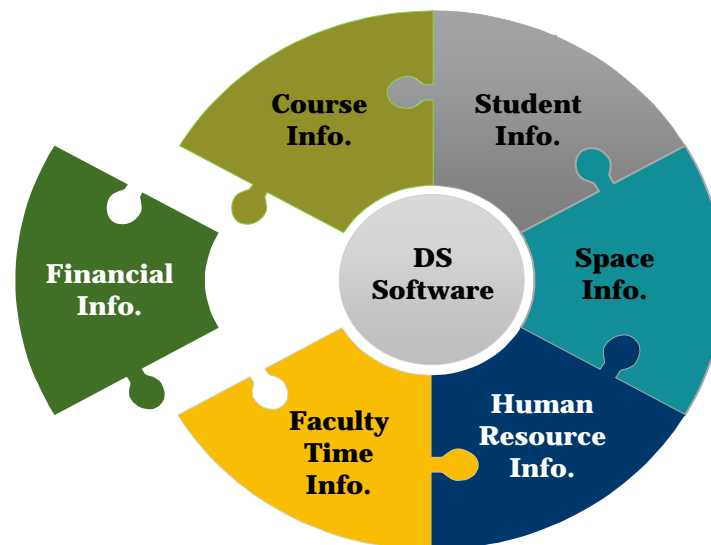
Step 5

Allocate Indirect Costs



Allocate indirect costs to programs using cost driver based allocation

- Indirect cost allocation calculation also requires a wide variety of non-financial information
- Each category and activity should be analyzed separately and assigned appropriate cost drivers
- Like direct costs, cost allocation can be a complex task, but decision support software and use of a variety of non financial data from institution allows cost allocation to be done fairly easily and automatically



Key is Identifying Appropriate Cost Drivers

Indirect cost categories are further broken down into relevant activities and cost drivers are assigned to each

| Sample Indirect Cost Categories | | |
|--|---|------------------------------------|
| Type of Expense | Activity | Cost Driver/Allocation Methodology |
| College or Departmental Overhead | Facilities & Space | Square Footage Utilized |
| Academic Overhead/ Academic Support | Library Services | # of Faculty + # of students |
| Institutional Overhead | Administration (HR/IT/Finance) | # of FT Employees |
| Student Services | Admissions (e.g. marketing/recruiting) | # of FT Students |
| | Advising | # of FT Students |
| | Counseling | # of FT Students |
| | Career Services | # of FT Students |

Cost allocation for indirect costs will be based on relevant cost drivers

Cost drivers will be defined in cost allocation software and will pull from both financial and non-financial databases

Final Product: Fully Loaded Cost per Course Information

| Sample Course Cost | | | |
|------------------------|-------|---------|-------------|
| School of Business | | | |
| Course 1 | Hours | % Total | Expense |
| Direct Costs | | | |
| Course Development | Hours | 10% | \$\$ |
| Course Management | Hours | 20% | \$\$ |
| Teaching | Hours | 40% | \$\$ |
| Tutoring | Hours | 20% | \$\$ |
| Advising | Hours | 10% | \$\$ |
| Assessment & Grading | Hours | 10% | \$\$ |
| Total | | | \$\$ |
| Indirect Costs | | | |
| Departmental Overhead | | | \$\$ |
| Academic Support | | | \$\$ |
| Institutional Overhead | | | \$\$ |
| Student Services | | | |
| Total | | | \$\$ |

Steps 2 & 3
Calculate direct cost of instruction

Steps 4 & 5 Allocate indirect costs to courses for a fully loaded cost