AIR Professional File

Association for Institutional Research
Enhancing knowledge. Expanding networks.
Professional Development, Informational Resources & Networking

Number 98, Winter, 2006

Strategies and Tools Used to Collect and Report Strategic Plan Data

Jennie Blankert
Graduate Assistant
Purdue University

Cheryl Lucas
Research Analyst
Purdue University

Jacquelyn Frost
Director of Institutional Research
Purdue University

Abstract

Academic institutions are increasingly interested in the collection and presentation of data to support strategic planning, accreditation, and accountability needs. With an increased emphasis on campus-wide involvement and centralized data collection at some institutions, the integrity, accessibility, and interpretation of data become key elements. The role the Institutional Research Office plays in the preparation and maintenance of this information is critical. This paper will take you through the process used to establish contacts across the university, the collection and management of data and the formatting of facts and figures for clear presentation to diverse audiences.

With the increase of data available to colleges and universities from both internal and external sources, and the dramatic increase in the technical tools available to manage and to access data, institutional researchers have the opportunity to become knowledge managers. Organizing data for decision-making in a meaningful and useful way is essential for strategic planning, accreditation, and other accountability needs for higher education institutions. The case study below describes the process of developing strategies and tools to meet the needs of strategic planning data collection and reporting that may be informative to professionals charged with similar tasks.

Background

In August 2000, Purdue University hired a new president. The new President's decision-making style is most assuredly data driven. One of the top priorities for the new President was to develop and implement a strategic plan. By November 2001, the Strategic Plan was approved by the Board of Trustees and was ready for implementation. The plan included strategies tied to the goals of 1) learning, 2) discovery, and 3) engagement to bring the university to the "Next Level: Preeminence." Specific metrics were provided for each of these strategies in order to assess measurable progress. In addition to measures that were internal to the university, there were also external metrics, or benchmarks, identified to measure the university's progress compared to a selected group of 11 aspirational peer institutions.

About the same time the plan was approved, an Office of Institutional Research (OIR) was created. Historically, the function of institutional research was handled by the Office of Budget and Fiscal Planning. However, with the increased data needs of the new administration and the demands of providing data for the Strategic Plan implementation, the President determined that a separate institutional research office was needed. The office fits organizationally under the Office of the President. This placement has proven helpful when garnering cooperation from offices and individuals across the campus.

Fortunately, two critical activities occurred prior to the arrival of the new President, setting thestage for moving towards a knowledge management role for the institutional

research function. The first was the creation of the Institutional Data Network (IDN). This group was formed in the summer of 1999 to meet several university needs including: 1) providing consistent and accurate data to external sources; 2) responding to information requests about the university in a unified way; and 3) serving as a coordinating body to provide accurate institutional research information. More than 45 staff members from across the campus were IDN members representing approximately 20 offices. The IDN met monthly to discuss data issues. Offices and individuals were identified as "official" sources of data and the culture of reporting with a unified voice was initiated. Corak and Wharton (1993) discuss the importance of strong leadership during times of institutional change. The IDN provided strength by unifying data and creating more knowledgeable administrators.

The second important activity that occurred was the preparation of the *Data Digest.* First published in January 2001, the *Digest* provides historical information about the university in an easy-to-use format on topics including: students, instruction, faculty and staff, research, and facilities. Data for the *Digest* was provided by the IDN members, each having responsibility for specific pages in their respective areas. The OIR staff members coordinated the collection and proofing of data. The actual document was designed by the marketing communications staff, who were also responsible for the Web-based version. In addition to now having a single authoritative source of data about the university, the climate for understanding the need for standard definitions, reliable sources, and data experts was established.

These two activities were instrumental in knowledge coordination and helped make a relatively smooth transition to the collection of data for strategic planning. With this new mind-set and buy-in from the university community, moving forward with collecting the Strategic Plan metric data was facilitated. Key data experts were in place, standard definitions recognized, consistent data sources identified, and timing of reports established.

Literature Review

In light of burgeoning technology and access to global sources, universities are facing a crisis that many large organizations are also finding themselves in: too much information, a lack of reliable information, improper storage, and an inability to share data or build on past work (Teodorescu and Frost, 2002). With networks allowing for the rapid transfer and processing of data and computers that are capable of an almost infinite amount of storage space, human factors become the limiting reagents in what our offices are capable of accomplishing. Time, attention, and knowledge become key resources that must be rationed and divided among projects. A *New Directions for Institutional Research* (2002) issue focused on the topic of "Knowledge Management in Higher Education," an idea that has gained popularity in industrial and executive arenas. More than describing the topic, the editors focused on how the model can be applied to institutional research to facilitate the collection, storage and dissemination of knowledge.

Historically, institutional research offices have been seen as repositories for management information. Institutional researchers have taken on the roles that resemble those McLaughlin, Howard, Cunningham, Blythe, & Payne (2004) refer to as data custodian and data broker. In these positions, institutional researchers gather, store and format management data for other university offices. However, these positions, as effective and necessary as they are, create a disjuncture between the collection of data and the use of data in decision-making. If data in organizations function to increase intelligence, inform policies and aid planning, the information must be tied to the audience who will use it and the need it will fulfill. Systems of collection, storage and retrieval must be designed with an end-use in mind. Institutional research offices need to move toward McLaughlin et al.'s third category of data management: Data Manager. This role is proactive in the processing and using of data to aid in "increased knowledge and accountability across the institution by using data-based information in decision making" (p. v). This position underlines the importance of integrating institutional research expertise in all stages of the decision making process in order to produce usable and relevant data.

The usability of data is determined by its accuracy, accessibility and availability in a timely manner. Data that lack any of these qualities have the potential not only to negatively impact decisions but to undermine the integrity of institutional research offices. McLaughlin et al. present many strategies for making data usable and valid. One key concept that is integral to effective analysis and reporting is the consistency of data definitions. McLaughlin et al. caution the reader to be wary of: ". . . . no agreement on definitions; incorrect interpretations; data collected in varying forms across campus; and, lack of adequate comprehensive measures" (p. 1). Definitions are the foundation for gathering quality data and sorting through bulk information. With concrete expectations about what information is needed, institutional researchers are better able to determine what is available, which source will provide valid information, and how to interpret and present the data in an effective manner. Establishing definitions is integral in data management and in workload reduction.

Another view that outlines the role of institutional research offices in acquiring usable data is one of "buyers" and "sellers" of information (Teodorescu & Frost, 2002). A large part of campus-wide data collection is the brokerage and coordination of knowledge. Institutional researchers have the ability to help knowledgeable people

connect with people who need information and vice versa. In Teodorescu and Frost's model of knowledge coordination, they suggest mapping out where on-campus information is available and how offices can gain access to it (p. 7). This type of model that focuses on the location of knowledge can also help to reduce data collection efforts, inconsistent reporting (when different units are collecting similar data with different definitions), and to identify data elements that are needed, but currently are not being warehoused on campus. Teodorescu and Frost suggest that once these maps are completed, institutional research offices can involve others in a local trade of information. While institutional research offices participate in information trading everyday on the national/federal levels, offices on campus may be inclined to hold their information near because of the resources they expend to collect data or perhaps because they view it as relative to only their area. However, institutional research can help to facilitate the campus-wide trade of information and the development of better data collection methods through sharing. While every office involved might not immediately need or be provided with data, they become aware of a future support service and are given the chance to become involved.

Collaboration, integration, and cooperation combine to place institutional research offices on the path toward knowledge management. While views of sharing, tolerance, and working together may seem somewhat of a utopia for most universities, growth and knowledge are gained through the process of moving towards this ideal. Knowledge management moves beyond the collection of management data elements and works to identify the organization's collective knowledge, as a whole (Serban & Luan, 2002). Technological developments allow researchers to share information at rapid speed; knowledge management helps to organize who holds what pieces of information. Most importantly, the concept of knowledge mapping, which includes accessibility of usable data and inclusion of multiple offices, effectively handles the limited resources of staffing and time.

Role of Institutional Research in Strategic Plan Implementation

The institutional research role in the implementation of this Strategic Plan was to coordinate data collection, authentication, storage and dissemination. To that end, a number of strategies and tools were developed to facilitate this work. Building a climate for cooperation, as described in the introduction, was essential. A next step was to come to agreement on the specific definitions for each metric (internal measure) and benchmark (external measure) so that appropriate data sources could be identified. A working group was created to take on this task consisting of the Director of Strategic Planning and Assessment, the Director of the Office of Institutional Research and three individuals representing the major areas reporting to the President: 1) the Provost's Office, 2) the business areas and 3) the Development Office. Once the definitions were determined, sources of data were identified along with individual contacts where appropriate. Figure 1 shows a template tool that was used to keep track of this information. While simple in format, it was extremely useful in organizing the information in a manner that could be used by a variety of individuals. To that end, the regional campuses of the university system used this template for their strategic plan metrics. This made identifying metrics that were common across the system much easier.

As mentioned previously, having an already formed data network (the IDN) was invaluable for identifying

Figure 1
Standard Metric Template

Strategic Plan for: Unit Name
Date for Plan: _____
Date Template Completed: _____

Ref. No.	Metric	Definition	Source	Comments
Goal 1:				
	First Strategy:			
B 1	Benchmark No. 1			
M 1	Metric No. 1			
M 2	Metric No. 2			
M 3	Metric No. 3			
B 2	Benchmark No. 2			

appropriate data contacts for the metrics. This worked well for contacts within the university, however, there was some information that needed to be collected directly from peer institutions. As a member of the American Association of Universities Data Exchange (AAUDE), Purdue University was able to rely on membership in an established organization that has a rich history of exchanging data. Yet, some information needed for this purpose was unique and there were no available data sources. In these instances, individual contact with each of the institutional research directors at the peer institutions was made in advance of sending them a peer survey. Having personal contacts and good working relationships with internal and external sources is another key strategy. Professional organizations that exchange data for institutions of similar types can provide a rich source of information.

Data Collection

In data collection, the validity and integrity of the data are extremely important. Ideally, institutional researchers would be involved in the discussion of and agreement on data expectations and needs to ensure the methods used produced data that met the administration's goals. In implementing the Strategic Plan, OIR played a key role in the identification of sources and in shaping productivity indicators so that they can be measured by available data. After the discussions and decisions were made, a data collection process began including: extracting, verifying, organizing, proofing and storing the data. None of these steps alone could have produced useable data. Each has its own place and all are of equal importance.

The most difficult aspect of collecting the data was determining definitions and interpreting data that had been prepared by the Strategic Plan authors. There were several ways that the data could be interpreted and it was soon discovered that definitions thought to be straightforward were open to a variety of different interpretations. For example, should the calculated percentage of American Indian students be based on the enrollment of graduate, undergraduate, or all students combined? Also, the time frame for reporting was an important consideration: was it an academic, fiscal, or calendar year? These issues of definition were solved in various ways: many of our staff had experience so they knew how data elements had been historically interpreted, and while this helped with some items, OIR spent a great amount of time seeking clarification.

To meet the needs of the Strategic Plan, five years of historical data were desired on each data element for the university and the peer institutions. However, as some data elements are only collected every other year and some institutions have only recently begun contributing to national databases, historical and annual collections were difficult at times. Another problem encountered when collecting historical data was that some definitions have changed in how national sources collect and report their data, and in how numbers are internally calculated. Because of the IDN, mentioned earlier, the university refined definitions to match data collected and needed across campus. At times, the current, more exact methods, were not comparable with historical data. This contributed to historical reports that reflect large drops or increases in numbers from one year to the next. In some of these instances we made notes and in others we chose not to collect a history but to begin with the current year. Additional definition difficulties were encountered when collecting data directly from the peer institutions. It was impossible to know their methods or calculations. For example, the manner in which the peer institutions collect undergraduate placement information varied widely from institution to institution with regard to timing, population and methodology. Information about financial aid going to underrepresented students was not possible to collect from the peer institutions. Without knowing that the data were comparable, and thus valid, some measures were dropped from the reports.

A third issue we encountered was among sources. Although most sources have different data elements, some contain the same data as others but may be calculated differently because of a variance in definitions. The OIR tried to determine best sources by the quality, integrity, and timeliness of the available data and tried to ensure that the same kinds of data could be retrieved from the same source in future years. An effort was made to ensure that data collected from one source did not conflict or disagree with data from a different source and if it did, a choice was made to use one source over the other consistently among reports provided by OIR. Inconsistent data can create confusion for the data collectors and for people who read the reports generated.

Benchmark data came from a variety of sources including: AAUDE, *U.S. News & World Report*, Common Data Sets, the National Merit Scholarship Corporation, and TheCenter, among others. However, most of the benchmark data, and the largest amount of data that are in the data repository (described below), are from the Integrated Postsecondary Education Data System (IPEDS). While access to IPEDS data is straightforward and the wealth of information is substantial, timing of available data is a concern. The most current data available may be one to three years old (depending on the survey).

One of the benefits in using the IPEDS Peer Analysis System (http://nces.ed.gov/ipedspas/) is that a peer group <.uid> file can be established and then loaded as a saved list to be used repeatedly when collecting different data items. Institutions can be selected by institution name, institutional ID or other selection criteria. Using a "Saved List" saves considerable time over entering peer

institutions individually each time data need to be generated, and institutions can easily be added or deleted to the "Saved List." After selecting the data that are desired from IPEDS, a file can be downloaded into Excel spreadsheets, thus making the information readily available for additional formatting or manipulation.

To ensure the validity and integrity of the data, all IPEDS data were extracted twice for verification (to ensure that the results were the same both times) before entering them into a data repository. Two separate staff members conducted the extractions on two different days. This process ensured not only the consistency of the data being extracted but that the variables being used matched the definitions. If the data varied, it provided an opportunity to reflect on the definition as well as to investigate the difference. For example, if faculty numbers are required, does that include both part- and full-time categories? Beyond refining definitions, this double-checking allowed us to discuss with the working group the availability of specific data elements and to determine the most meaningful data to use. In order to maintain accountability within our office and a record of our progress, all proof sheets were printed as hard copies before proofing, then initialed and dated.

For the number of metrics identified in the Strategic Plan, it was inevitable that an overwhelming amount of data had to be collected. This information had to be tracked because it would be collected in future years. It was imperative that the data be stored and organized so that they could be easily retrieved. The storage capacity had to be flexible enough to ensure there was room for new data elements or new peer institutions and to be able to add yearly updates. It was necessary to be able to quickly produce summary reports on selected data elements.

In order to track the benchmark data being gathered, an Excel spreadsheet tool called the holes analysis (Figure 2) was developed. This one sheet contains an identification of each benchmark, its definition, who is responsible for gathering the information, its source, which years' data were collected, and various categories that help the document's users identify what data are available and the stage of the proofing process.

Gose (1983) examined reasons for the loss of data integrity, pointing out that data may be corrected in the database, but if all of the reports are not updated, the information going out of an institutional research office can be problematic. Realizing there are several reports issued with the Strategic Plan data, the holes analysis evolved in the second year to include a document control area. Initially, check marks were placed in the last columns for verifying, entering, proofing, and document control. However, OIR staff members found that putting the initials of the individual responsible in each of the small boxes provided a better tracking mechanism and provided greater accuracy. When newer figures became available or computation strategies changed, it was found helpful to keep the same researchers involved. Because multiple sources and interpretations are possible, being able to return to the collector can be important during the process when figures are inconsistent or appear to be in error.

In order to store and organize the data, an OIR Research and Planning Analyst designed a data repository tool in Excel using Visual Basic for internal office use. The Visual Basic code for this repository can be found at: http://www.purdue.edu/OIR/irvba/default.htm. Excel was appropriate because it provides adequate space for documentation of data elements and does not require special training to access the raw data. The data repository is designed so that each data item collected is in a separate tab in the spreadsheet. Each tab contains multiple years worth of data for that particular item. The only exception was for diversity information (race/ethnicity by gender). Because there was such a large quantity of data, each year's data are on separate tabs. There are several nice features of the data repository. One is the "Main Menu" button that acts as an index to the data in the data repository. By clicking on the button, the specific data element is selected and the sheet will automatically

Figure 2
Holes Analysis Tool Used for Tracking Benchmark Measurements

Shaded area indicates data/measurements that are not included in the progress report.
Cross-hatching indicates data/measurements are not used in that particular report or stored in that format.

	Benchmark	Definition	Source	Comments	Staff Responsible	Data Collected	Data Checked	Years Collected	Repository: Entered	Repository: Proofed	File Name/ Location	Detailed Data Sheet Entered	Detailed Data Sheet Proofed	Progress Reports Updated	Progress Report Proofed	Source Binder Updated	History File Updated
B1	*Faculty salaries*	For full-time tenure and tenure-track faculty for a given fall semester the average academic year salary by rank	ACADEME for Faculty salaries by rank	Waiting for Revised Academe Worksheet to be proofed.	CL	MD		Fall 2003			CDS Binder	MD	CL	MD	JF	JB	JB
B2	*National Academy /other prestigious memberships*	The number of faculty who are members in the National Academy of Sciences for a given year.	TheCenter	Peer data may not be available until late October. Most recent year may report only Purdue, if do not received data in time.	JF	2002 MD	MJF	2002, 2003 if possible	MD	MJF	G:\Strategic Plan\Data\Bench marks	MD	MJF	MD	MJF	JB	JB
		The number of faculty who are members in the National Academic of Engineering for a given year.	TheCenter	Peer data may not be available until late October. Most recent year may report only Purdue, if do not received data in time.	JF	2002 MD	MJF	2002, 2003 if possible	MD	MJF	G:\Strategic Plan\Data\Bench marks	MD	MJF	MD	MJF	JB	JB
		For disciplines in the Arts & Humanities, the number of grants awarded and participation in fellowship programs.	TheCenter	Peer data may not be available until late October. Most recent year may report only Purdue, if do not received data in time.	JF	2002 MD	MJF	2002, 2003 if possible	MD	MJF	G:\Strategic Plan\Data\Bench marks	MD	MJF	MD	MJF	JB	JB

bring the relevant data tab up on the computer screen. Another feature that is built into the data repository is the ability to run summary reports on the collected IPEDS data. These reports allow the generation of specific numbers that are relevant to the Strategic Plan. When updates and corrections are made to the data, the reports are automatically changed in accordance.

Presenting Usable Data

In the strategic planning process, it was not enough to gather and store data for the university management. A key element was being able to report on the data in a manner that enables the administrators to make accurate and timely decisions. For the reporting of data to go smoothly, a few strategies were used. The first strategy was to assess the situation and to produce reports from the data that meet the needs of the audience and the purpose of the report. A second strategy that was used and may appear simple, but adds continuity to reports generated by OIR on the Strategic Plan data, was to maintain clean graphical designs. Another aspect of design that promotes the readability of reports was to maintain consistent graphical design elements among documents and across projects. These common elements help to establish a brand identity for the office. The final strategy was the need to maintain thorough documentation on the various steps in the collection process. These strategies contribute to both the usability and accessibility that is strived for in any large organization as it moves towards data-driven decision making.

Presenting data in a usable manner can be achieved by asking a series of questions before producing reports. One commonality among strategic planning documents is that the University President's Office is always in the audience and at times is the sole audience. Other possible audiences include the Provost's Office, the Board of Trustees, executive administrators, and the more general policy and decision makers or administrators spread across the campuses. Most of the documents produced with the Strategic Plan data are requested by the President's Office and do not need to be heavily contextualized. This office has all of the definitions and key indicators available to them and lines of communication are open between that office and OIR. These lines of communication are important because OIR has the ability to clarify data or provide additional information as needed. However, when reports are requested that will be viewed by audiences who have not made specific requests or who might not have direct access to the data gatherers, a new set of questions must be asked:

- For what purpose will these data be used? (Is there a chance this information or this document will go public?)
- What is being represented in this document (are the data just for description purposes or the justification for a program or funding)?
- What knowledge background does the audience have about the Strategic Plan?
- How familiar is the audience with the definitions of the benchmarks and metrics?
- For the audience's purpose, how specific does the information need to be?

At times the President's Office will request data they are familiar with to be displayed in a different manner. At these times members of that office might only have a general idea of what they want the end product to say about the university and OIR must make decisions about how to make the data meet their needs. In these cases, OIR must assess what data have met or not met a similar need in the past and what resources are currently available. All of the above questions and considerations help to define the situation and the nature of the reports and to shape how the bulk of the data in the repository are extracted and formatted for presentation.

As much data as possible on each metric and benchmark in the Strategic Plan were captured and stored. Not all of the data made it into every document. Specifically two main reports were created – the first is the general *Strategic Plan Progress Report* , which is widely distributed, and the second is a data book that presents all of the details of the information gathered. In a widely distributed report (Figure 3), summary numbers were extracted and reported.

For example, in M4 (Metric 4) the data on faculty separations are reported as a percentage of those leaving for a reason other than retirement or death. The data could have been broken down into categories of leaving for health reasons, not receiving tenure, contract not being renewed, or because they were fired. Returning to the definition, the main idea behind the metric was how many staff members were separating and that is the report focus. In reporting the benchmark measurements, the individual data for each peer institution were not provided, as the peer institutions' mean and the university's index to the mean were determined to be the most important and reported in this summary fashion. However, in the detailed data book, each metric and benchmark has its own sheet to display all available data (Figure 4). Because these detailed data books have limited distribution to the upper level administrators, the benchmark sheets display the university's data along with the detail of the peer institutions' data. Both widely distributed reports maintain a consistent format, as do all of the data book sheets, whether they are reporting on metric or benchmark data.

A combination of effective page design and data layout contributes to the readability and understanding of a

Figure 3
A Portion of The 2003 -*2004 Strategic Plan Progress Report*

		Fall 2003 Cohort 2002	Fall 2002 Cohort 2001	Fall 2001 Cohort 2000	Fall 2000 Cohort 1999	Fall 1999 Cohort 1998
M4	Number of staff separations (in one year)	565	556	574	n/a	611
	Percent of staff returning (in one year)	90.8%	91.0%	90.4%	n/a	89.4%
	Percent of staff separations for reason other than retirement or death	8.1%	7.5%	8.5%	n/a	9.1%
	Number of faculty separations	71	62	97	n/a	81
	Percent of faculty returning	95.8%	96.3%	94.3%	n/a	95.3%
	Percent of faculty separations for reason other than retirement or death	3.0%	2.3%	4.0%	n/a	2.8%
B3	Average SAT Scores	Fall 2004	Fall 2003	Fall 2002	Fall 2001	Fall 2000
	Purdue	1149	1150	1150	1134	1129
	Peer Institutions' mean	n/a	1245	1245	1219	n/a
	Purdue's index to the mean	n/a	0.92	0.92	0.93	n/a
	SAT 25th - 75th Percentile	1030-1260	1030-1270	1030-1270	1020-1250	1010-1240
	Average high school rank					
	Purdue	76%	77%	77%	77%	77%
	Peer Institutions' mean	n/a	88%	86%	84%	n/a
	Purdue's index to the mean	n/a	0.88	0.90	0.91	n/a
	Percent of degree-seeking, first-time, first-year (freshmen) students with high school ranks in					
	the top 10%	27%	28%	28%	28%	27%
	the top 25%	60%	62%	62%	61%	60%
	the top 50%	92%	93%	93%	95%	94%

document. There are four basic principles for effective page design [Williams (1994) provides a detailed explanation]. An easy acronym to remember: Contrast, Repetition, Alignment, and Proximity (CRAP) are simple concepts. These principles work within a document, and to unify and add credibility to multiple documents originating from the same source. These principles are best explained through words and illustrations.

Contrast is achieved through fonts, shapes or colors. The most basic font division is between serif and san-serif fonts, or those with and without feet:

Arial would be an example of a san-serif font

Times New Roman is the most recognized serif font

Another aspect of contrast can be thin verses thick lines, or black on white juxtaposed to white on black:

Figure 4
Sheet from The Detailed Data Book

For a given fiscal year, state appropriations, and tuition and fees (as reported to IPEDS), divided by FTE students (as reported to IPEDS for a given fall semester corresponding to the fiscal year calculated value).

B9) Appropriations/FTE Student

	State Appropriations per Student FTE							
	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
University 1	$9,202	$9,536	$10,329	$10,781	$10,912	$11,158	$10,573	$10,656
University 2	$10,692	$11,454	$11,955	$13,496	$14,357	$16,910	$17,736	$16,372
University 3	$12,162	$12,641	$13,386	$14,989	$15,835	$18,196	$18,874	$16,785
University 4	$16,640	$17,001	$18,279	$24,333	$25,761	$28,113	$23,833	$22,554
University 5	$12,300	$13,947	$14,144	$14,401	$15,532	$18,889	$15,930	$14,373
University 6	$7,835	$8,251	$8,246	$8,452	$8,926	$9,989	$9,962	$9,658
University 7	$8,643	$8,824	$9,044	$9,471	$9,738	$9,740	$10,082	$9,549
University 8	$5,509	$5,480	$5,563	$5,674	$6,093	$6,479	$5,726	$5,451
University 9	**$6,750**	**$6,986**	**$7,134**	**$7,168**	**$7,537**	**$7,814**	**$7,486**	**$7,555**
University 10	$5,573	$5,349	$5,659	$5,678	$6,133	$6,057	$6,214	$5,881
University 11	$8,925	$8,723	$9,837	$9,290	$9,265	$9,416	$10,005	$9,668
University 12	$9,884	$9,892	$9,942	$10,069	$10,677	$11,394	$9,878	$9,781
Peer n=	11	11	11	11	11	11	11	11
Peer Mean	$9,760	$10,100	$10,580	$11,512	$12,112	$13,304	$12,619	$11,884
Univ. 9's Index to the mean	0.69	0.69	0.67	0.62	0.62	0.59	0.59	0.64

Source: IPEDS Finance and Enrollment Surveys. Cornell's fiscal year 2002 State Appropriations is from Cornell's financial report.

Black on White

White on Black

When items within a report are similar, not starkly different, they contribute to clutter and cause readers to have to devote time either rereading information or having to read all of the details instead of being able to easily scan the document to identify what is relevant for their needs.

Repetition is the key to unification and credibility. Simply repeating shapes, lines, and textures can enhance the cleanliness of a document. Repetition between documents helps readers associate the same office as the source. In the instance of strategic planning, the key to determining where benchmark data were located in various documents was the repetition of halftone boxes (gray shaded). This element started in the first definitional documents (see Figure 1) to help differentiate between metrics and benchmarks and was carried through the final reports of the data (Figures 3 and 4). In addition, when OIR produces monthly reports for the Board of Trustees and the President's Office there is a double line outlining the data; this double line was carried into reports on strategic planning data. It can also be noted that the majority of data documents issued from our office for public utilization have two column layouts.

Alignment is the next principle, which also contributes to a clean and credible page layout. Every element on the page should have a place in relation to other elements.

In Figure 5, a small portion of the *2003-2004 Strategic Plan Progress Report*, a column layout was used to ensure that the numbers identifying the metrics could be easily scanned. The years are always placed the same, on top of the data, and arranged with the most current year on the left.

The fourth principle, proximity, uses space and the lack of space to show relationships among elements. The key is to place all related elements together to form one unit. Grouping can be accomplished by breaking blocks of data from one another with lines or by keeping consistent spacing around the outside of the element.

```
4 4    4    4          5 4 5 4 5 4
4  4       4      4     4 5 4 5 4 5
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Even though the numbers above on the left are the same, they are disjointed because of their proximity to each other, while the numbers on the right are unified even though they are not all the same. Beyond proofreading and double-checking numbers, remember to check for C.R.A.P: Contrast, Repetition, Alignment,

Figure 5
Portion of the *2003-2004 Strategic Plan Progress Report*

B2	Number of faculty who are members in the National Academy of Sciences	2003	2002	2001	2000	1999
	Purdue	3	3	4	5	6
	Peer Institutions' mean	n/a	32	32	32	31
	Purdue's index to the mean	n/a	0.09	0.13	0.16	0.19
	Number of faculty who are members in the National Academy of Engineers					
	Purdue	14	11	11	11	13
	Peer Institutions' mean	n/a	23	23	22	21
	Purdue's index to the mean	n/a	0.48	0.48	0.50	0.61
	Number of faculty awards in Arts and Humanities					
	Purdue	n/a	5	6	3	5
	Peer Institutions' mean	n/a	10	10	9	9
	Purdue's index to the mean	n/a	0.49	0.59	0.35	0.57
M2	Number of named and distinguished professors (as of September)	Fall 2004	Fall 2003	Fall 2002	Fall 2001	Fall 2000
		98	90	78	67	66

Figure 6
Documentation Sheet for Measurement of Faculty Salaries

Documentation Sheet - B1

Benchmark 1

a. Faculty salaries by discipline and rank.

Definition

a. For full-time tenure track faculty for a given fall semester the average academic year salary by rank.

Date Type

Academic Year

Source

a. AAUDE and Oklahoma Faculty Salary Survey by Discipline.
b. ACADEME for Faculty Rank Averages.

Data Availability

a. AAUDE Faculty and Oklahoma Surveys available July 15.
b. Issue of Academe is labeled March/April, but comes out at the end of April. Purdue data is available about December 1st.

Contact

For Purdue		*For Peers*	
Name:	Cheryl Lucas	Name:	Chris Maxwell
Office:	Office of Institutional Research	Office:	Office of Institutional Research
Title:	Research Analyst	Title:	Research and Planning Analyst
E-mail:	cdlucas@purdue.edu	E-mail:	maxwellc@purdue.edu
Phone:		Phone:	
Fax:		Fax:	

File Reference

Comments

Chairs and department heads included, assistant deans or higher excluded. Visiting faculty included, non-academic departments excluded. Georgia Tech does not belong to AAUDE, so source will be Oklahoma Faculty Salary Survey by Discipline.

Purdue's submission excludes SWT faculty and librarians beginning Fall 2003.

and Proximity when getting ready to distribute a report.

Documentation

Once the reports were issued and the frenzy from the first year of collecting the Strategic Plan data calmed down, OIR began to assess the process, notes, and needs from the first year. One tool that was developed as a result of the assessment was the documentation sheets (Figure 6).

These sheets, one for each measurement, coordinate the knowledge needed to annually reproduce strategic plan data. Some key elements of this document are:

- The time frame on which data are based: calendar, fiscal, or academic year.
- The OIR staff member responsible for data collection.
- Additional data experts outside of institutional research.
- Identification of national sources.
- Equations used to calculate the reported figures.

- Inconsistencies, peculiarities, and notes about the data.

One of the pitfalls of a small office is that individuals become specialized in their tasks. One or two people can be responsible for the entirety of a project. The goal of the documentation sheet is to maintain consistency from one year to the next, whether the same individuals are involved in the project or not. These sheets enhance the ability to reliably reproduce reports, using the same sources, calculations and definitions. They also serve a dual purpose of coordinating knowledge across the campus, by recording the OIR member's knowledge and that of staff from other contributing offices.

Summary

A number of strategies and tools were presented in this case study to facilitate knowledge management for institutional research professionals. These include:

STRATEGIES

- Do pre-work – Ensure Climate Set for Knowledge Management
- Establish Process for Developing Internal and External Contacts
- Facilitate Role of Institutional Researchers as Data Managers
- Develop Effective Tools and Techniques for Data Storage, Collection and Usage

TOOLS

- Metric Definition Template
- Holes Analysis
- Data Repository
- Report Template
- Documentation Template

Next Steps: While much work has been done, there is still much to do. Several progress reports have been completed and distributed, but there are the next few years' reports and more data to collect. Additionally, all of the units across the campus are preparing strategic plans and annual progress reports. The OIR is providing data support for these areas. To facilitate this, each major unit was asked to complete the metric definition template. A database was designed with a Web interface to capture this information. The metric definition data at the unit level will be analyzed to identify common metrics across the university so that priorities can be established for collecting and reporting data. Additionally, at the central university level, this information can be summarized for upper level administrators to understand the commonalities across their units. For example, the Provost will be able to clearly see which of her areas are using the same metrics. This will also facilitate the development of any new data definitions that may need to be prepared so that, as appropriate, the same definitions can be used across units.

Other technical tools are being developed. A Web interface to collect strategic plan data at all levels (i.e., school/college and department) is being developed to ensure easy access and consistency. A resource guide with specific information about data sources, links to data and a list of data contacts will be available on a Web site. A number of internal metrics could not be reported initially because no data were available, so new data collection processes are being developed. And there is a desire to make the actual report preparation more automatic and less labor intensive.

In summary, it is important to set the stage and do the background work. Having a campus climate that is data friendly is essential. Understanding the value of human factors of all kinds simply cannot be overestimated. Being specific about definitions ensures consistency and facilitates accuracy. Finally, it is extremely important to document. Timely, accurate and thorough documentation is a huge benefit for all involved. While the tools described above were developed specifically to meet the needs of our office, it is hoped that they can have wider usage and assist you in your work. The strategies described provide a larger context for doing institutional research and if successfully implemented, can move professionals closer to becoming effective knowledge managers.

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Editor:
Dr. Gerald W. McLaughlin
Director of Planning and Institutional Research
DePaul University
1 East Jackson, Suite 1501
Chicago, IL 60604-2216
Phone: 312/362-8403
Fax: 312/362-5918
gmclaugh@depaul.edu

Associate Editor:
Ms. Debbie Dailey
Associate Director of Planning and Institutional Research
Georgetown University
303 Maguire Hall, 37th & O St NW
Washington, DC 20057
Phone: 202/687-7717
Fax: 202/687-3935
daileyd@georgetown.edu

Managing Editor:
Dr. Terrence R. Russell
Executive Director
Association for Institutional Research
222 Stone Building
Florida State University
Tallahassee, FL 32306-4462
Phone: 850/644-4470
Fax: 850/644-8824
air@mailer.fsu.edu

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