

**Information Warehouse Office  
Environmental Scan of Issues Faced  
And Needed Projects and Purpose(s)  
Draft7/17/05**

Although the UIS and IIW have been available and developing for over 13 years, the present situation is new. Not only are the two being brought together organizationally, technically, and in how we present information, but the external demands on the operational data store and data warehouse are expanding in volume and urgency. The Information Warehouse Office (IWO) faces constantly shifting as well as increasing priorities and uncertainties as university needs change and evolve. We will also see a largely new group of administrators taking over the UA next year. We need to plan to handle not just current needs, but also what could be required in the future.

The following format is not that of the typical environmental scan. Many of the scan type issues are known to the community and the demands for services are well known to those wanting them. What we have tried to do here is translate these demands, internal to IWO (e.g., for maintenance and necessary updates of our systems) and external (NTR modeling<sup>1</sup>, Matrix imports, greater support of transaction work) into short statements that identify the situation giving rise to the issue or problem and provide a purpose statement on what is gained by addressing the issue successfully. Implicitly, and sometimes explicitly, we also mention the costs of not successfully addressing the issue.

In one sense this could be thought of as part of an ever evolving menu of tasks of sufficient magnitude, significance, and effort that they arise above the routine tasks of adapting to changes in system codes, replacing bad disk drives, table reformatting, needs for a new field in a table, etc. that are the ongoing activities of any successful warehouse.

**The report is organized in sections by types of tasks or issues. Each section leads with specific recommendations from the “Initial Report of the Focused Excellence Study Team on Data Analysis and Planning (RDAP),”** June 21, 2004 from the Committee chaired by Sally Jackson, CIO. This document is the guiding document for the IWO and the joint operation of UIS and IIW and much of the activity discussed below. The report has been edited into an operational plan. This operational plan, however, will take a number of years to reasonably complete. This environmental scan can be thought of as an effort to combine the key issues of the operational plan with the many immediate and emerging needs and issues that we must prioritize and address in the shorter term.

### **I. Expand and improve information resources at the UA**

#### **Recommendation 4: Maintain and expand the range of data available in UIS to include sources not currently included. (RDAP)**

**Maintain Data Warehouse (DW).** Maintenance of the DW data and code is a constant activity. As the application systems and business practices change, the data and build programs must be adapted to match. Much of this is routine. Five of the more complex ones that are key at the moment are listed below.

*Purpose(s):* To expand completeness, usefulness and user trust in the system as underlying data changes and expands.

**Fund group coding--GASB fix:** When the UA changed to GASB for financial reporting, the account ranges method of grouping funds was no longer completely correct. The GASB adjustments are now stable and FSO recommends keying on Minor Fund Groups (MFG) for coding fund types.

*Purpose(s):* Replace account ranges method with codings based on MFG. This will also foster more reliable and easier reporting on Proposition 301, summer session, scholarship types, etc.

**Annual reporting Profile:** The IIW department profile was developed to meet an ABOR requirement. Over time, other information was added at users' requests making it easy to get much of what they need from a single report. The expanded profile, however, is now overwhelming as a reference for annual reports and for some first time users.

*Purpose(s):* Working with IPASS, develop an additional profile designed specifically to address current monitoring and reporting needs including agreed standard ratios. Use this to pilot a Annual Reporting and APR toolkit (See separate item below) site in IPASS.

**Budget data:** Reporting requirements and university management analysis demand primarily expenditure data. As a result, budget data has not been made available in the IIW though it is used in some of the IIW build code. As our number of transaction support users increases, however, the demand for budget information, on positions and vacant lines, for instance, grows.

*Purpose(s):* Create budget census files for start of year budget and then other periods if needed. Make sure that the many budget codes are clean and documented.

**Object-code change tracking:** In the 14 years detailed financial data has been added to IIW, the UA has revised, added, and dropped object codes frequently. Analyzing expenditures by object code over time now requires an onerous remapping of past codes to present ones sometimes separately for each department or account examined.

*Purpose(s):* Create and implement a method for tracking changes in object codes, as we have for changes in course prefixes and majors, to map past object codes to the present ones.

**New Race/Ethnicity codes:** Starting in fall 2005, Admissions is changing the ethnicity codes for new students to the coding proposed by OMB. Some federal (involving penalties up to \$30,000 a year) and other reporting requires comparison of current year with previous years as does any look at trends.

*Purpose(s):* Capture the new codes and map them to the old codes for continuous reporting.

**Recategorize faculty:** Many circumstances and special cases that the original IIW faculty categories covered no longer exist and new employee categories, like multi-year lecturers, have arisen. As a result, the present categories are incomplete and unclear in some cases.

*Purpose(s):* Working with OIRE, CABO, etc., develop and code a new, more relevant set of faculty categories and the business rules for assigning people to these categories.

### **Install new server cluster**

*Situation:* The UIS and IIW database server and disk systems were purchased in 1999 and 2000 and both are inadequate in speed and reliability for the demands of expanded data and users, the expectation of a common user DW (see next item), and handling significantly larger volumes of data due to Matrix, etc.

*Purpose(s):* In install a faster more reliable server system that can handle the load, build and user requirements of as both data requirements and user expectations increase. Place system in Computer Center machine room and reconfigure back-up and test servers.

### **Common user DW for UIS/IIW**

*Situation:* UIS and IIW developed independently and, after about 13 years of operation, have both accumulated a large number of tables that are not significant for most users. This has resulted in increasing clutter and makes both systems more confusing and difficult for users. At the same time, the perceived lack of a secure central store is producing multiple stores, often more than one in a single office in both units and central applications.

*Purpose(s):* Build a DW specifically for users including the daily refresh (UIS) and the census tables (IIW). Store source, system, hyper-sensitive, and confidential files and other non-user tables and files elsewhere. Build separate staging areas for processing and storing source and other non-user tables and handling access to hyper-sensitive tables.

### **Teaching Load file process**

*Situation:* The present teaching load files process is subject to a great deal of human error and dependent on one person's idiosyncratic programs. Because the process is burdensome, it is run only after data is submitted. Thus, no views in standard report formats are available until it is too late to correct any errors made.

*Purpose(s):* Put Teaching Load file process into daily production from OIRE during the season, redesign/rebuild process to extract and load to redesigned table and prepare the dependent reports.

### **Data\_Link (Org\_map) process**

*Situation:* Data\_Link is the set of update programs for maintaining the university's organizational structure and tracking changes in organization, courses, degrees, etc. so that information can be compared over time in spite of changes in how the application systems code the data. Virtually all college and department reporting is structured through the Data\_Link tables. Built in FoxPro in 1993-94, and added to since then, this system is vulnerable. My move from the Beal building revealed this when it rendered the system inoperable for a couple weeks until fixes could be worked out.

*Purpose(s):* Rebuild the data\_link structure with a long-term viable update program; progressively rebuild org\_map and the SIS data\_link tables to be more functional.

### **Validity checking**

*Situation:* The more data we have and put in a usable form for users, the more possible errors and inconsistencies can occur. Right now monitoring this is largely up to us.

*Purpose(s):* Standardize the validity checks and put them on web sites in logically related groups so users can do their own checking and correct at their own pace. This will encourage responsibility for data quality to migrate to the sources.

### **Code tables.**

*Situation:* Many variables in present operating systems have code schemes but no code tables. Information on code values, if it exists, exists only in paper or other text documentation. This is largely useless to users in a reporting environment.

*Purpose(s):* Create and then get the responsible offices to maintain missing code tables including keeping them up to date when code values change.

### **IWO/UIS metadata & education**

*Situation:* As the volume of data available has increased, so have the variations in the ways questions can be answered. This has led to confusion and frustration for users over things like different definitions of major or faculty that result in different answers depending on what files ones uses and how one does a query.

*Purpose(s):* Create definitional materials and tutorials that explain the broad concepts behind the data types so users have a better sense of what they are looking for when they start out.

## **II. Get needed data into UIS-IIW in effective forms**

### **Recommendation 2: Make transactional system data available to UIS, and thus to consumers. (RDAP)**

#### **Data Access Policy**

*Situation:* The present policy is adequate as far as it goes but was developed at a time when just getting data was a major problem. Today, we have the key data sets (with exceptions for replacement systems) but lack most information from more peripheral systems. The UA has no tradition of providing such data for university use.

*Purpose(s):* Update the Access Policy to articulate the institutional obligation to provide both data and metadata for all university wide data systems and get revised policy approved.

#### **New data sets and variables to IIW**

*Situation:* Data available but not yet analyzed and presented for users is becoming increasingly important and expected for student and cost management and management generally. Without having the data centrally, units re-enter data into shadow systems to track and code it as they have for so many other financial and personnel data issues.

*Purpose(s):* Analyze and determine appropriate business rules and documentation for needed data and import into system. Two priority sets to import are Purchase card and TMIS (Telecom Mgt Info System).

#### **Space data**

*Situation:* Some space data, largely unanalyzed, is in UIS/IIW, but we are missing much of the campus space and

space costs data that are necessary for good space management. The campus interest in GIS systems would be greatly facilitated if space data were available from a common source with standard GIS coordinates. Having such data centrally could reduce the ad hoc creation of new space data variants as more systems using space data come on line.

*Purpose(s):* Inventory what space data is potentially available, understand how it interrelates, and translates into things like cost per square foot, and import and implement space use, GIS coding, and total cost of operating reporting capabilities in UIS/IIW.

### **NTR Category Coding**

*Situation:* To better manage the student recruitment process and track and manage the net revenue received as financial aid is awarded and students matriculate or not, the University undertook the Net Tuition Revenue effort. The analysis of NTR is well advanced but putting the analysis into production as a day-to-day monitoring and management tool is not. This can be done by hand coding new scholarships, fees, etc. and running the complex reports regularly. This would be time consuming and, for several thousand codes, is hard to do consistently.

*Purpose(s):* Analyze the factors that drive the NTR categories needed and put the process into production based on business rules. Develop extracts of Admissions and Financial Aid data from MATRIX to populate the reports during the recruiting phase.

### **Student data warehousing**

*Situation:* If and as Matrix expands, we will increasingly have to import matrix data to supply the information that is presently available but will stop being available from SIS, e.g., as has happened with test scores. Alternatively, we will have to switch sources to DB2 for SIS data. The NTR project serves as a pilot for the Matrix part of this project.

*Purpose(s):* Ensure that student data is provided to continue present reporting and to address new information needs such as student prospecting and the use and success of financial aid.

## **III. Provide needed analysis and metrics in standard reports and queries**

### **Recommendation 9: Involve academic administrators in “mainstreaming” the use of information in deliberative and decision-making processes. (RDAP)**

#### **Teaching costs**

*Situation:* To make effective course management and cost containment a way of doing business, monitoring and metrics must be built into day-to-day work rather than the result of periodic, ad hoc reports as is presently the case.

*Purpose(s):* Ensure reports are in production so teaching costs and faculty use are documented and understood including standard queries & metrics for instruction cost issues.

#### **Administrative quality measurement**

*Situation:* Isolated tests have shown that unit performance in handling administrative tasks varies widely but with no measures for this, we cannot target improvement efforts. Measures of volume of administrative activity are also required for valid total cost of operating reporting and for performance measures for new and replacement administrative applications and for measuring business success of new administrative applications and process improvement projects (see below).

*Purpose(s):* Create volume and performance measures on administrative activities and standard unit by unit reports appropriate scaled to unit business volume.

#### **Support, Service and Administrative profiles**

*Situation:* Academic units have been partially managed with comparative unit profiles for 13 years. No such monitoring exists for support, service and administrative (SSA) units on resources and resource changes over time relative to the cost drivers for those units. This is in a context where an obviously impossible idea prevails that support units can continually take much larger cuts than academic units in spite of continually expanding academic activity.

*Purpose(s):* Create profiles that monitor resources available to SSA units relative to their workloads for general management and budget and costing issues.

#### **Total cost of operations reporting**

*Situation:* At the present time, there is little or no information available centrally on the total costs of operating a unit or activity. Without this information, it is virtually impossible for managers at any level to make decisions that account for the costs that those decisions impose on other units and the university.

*Purpose(s):* Provide total cost of operating reports that show the costs of space use relative to benefits, costs of administrative practices and other factors that make administrative practices more or less efficient and effective.

### **IV. Make entry points to information easier and more effective**

**Recommendation 5: Continue developing self-service information retrieval tools around recurring planning needs. Recommendation 8: Continually improve the points of entry to information resources. (RDAP)**

#### **Administrative Operations Support**

*Situation:* The UIS supports administrative activities by permitting download and analysis of data and populating unit 'bookkeeping' systems, e.g., for tracking effort reporting and subprojects on grants. The IIW was developed to address management and external reporting needs; today most of those needs have been addressed. Management questions are becoming more specific and edging into administrative operations, e.g., appropriately handling teaching assignments and equity issues. A large proportion of the new users for the IIW since we added more administrative support queries have had business management titles and reasons for requesting access to the secured sites. The demands of Matrix, Kualu and other application system projects will increase the need for administrative support reporting as the older supporting tools go away and high costs will inhibit duplicating them on the applications.

*Purpose(s):* Address the need for faster, more comprehensive, and adaptive reporting for the campus that facilitates administrative activities; make administrative reporting less subject to disruption by changes in administrative systems; and pre-empt the need for developing further shadow and support systems in the units themselves.

#### **Tool Kits development.**

*Situation:* Many occasional or periodic activities need to be handled by administrators or others who are not familiar with the process. Tracking down relevant information, is presently complex (getting forms, policy, regulations, relevant information, etc.). The tool kits would create one-stop-shop sites for situations of this type and make administrative tasks easier, especially for less frequent tasks.

*Purpose(s):* Foster development of on-line toolkits by responsible offices and then support their toolkit site development for things like APR/Annual Reports, new teaching assignments, and faculty equity and retention.

#### **Query Hosting and Brio Viewer**

*Situation:* There are limits in both volume and detail of the reporting and analytic capability any office can present to users. This needs to be supplemented with the use of queries using tools such as Access and Brio Query. Brio has special potential for this now that free viewers give those accessing central queries a great deal of flexibility in selecting units, data, pivots and ways of viewing and reporting the data.

*Purpose(s):* To establish a site for hosting IWO and user queries that will be available to the campus in tools they are familiar with or that are easily available and easy to manipulate. Encourage the campus to provide candidate queries for this site and set up process to vet and standardize them as needed.