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1.0 **Goal of the Reporting Strategy**

The goal of the reporting strategy is to facilitate, through data reporting pathways, appropriately broad access to enterprise data while respecting the need to secure sensitive data wherever such data resides or is transported in the organization. The strategy attempts to address this goal by providing strategic guidance on reporting tools, appropriate data sources, and guidance for determining who should write reports, where the report definitions should be stored, and how the reports may be exposed to the user community.

It is also important to note that while this strategy addresses some items just used in HCM, it does include all the same definitions, concepts and strategies as the Finance reporting strategy. It is important that the University have these same items across both administrative systems.

2.0 **Reporting Concepts**

The days when reports emerged as green bar, z-fold, tractor feed documents are behind us. In order to have a strategy document for reporting, there must be some attempt to define what reporting is.

A modern view of reporting encompasses everything from green bar documents to mail merge documents, spreadsheets, graphs and charts, dynamic pivotable displays of information and “dashboard widgets” such as tachometers representing key performance indicators [KPIs]. The concept of reporting has fuzzy boundaries. It is useful to examine the boundaries to try to establish what does or does not constitute reporting.

**A report is always intended for direct human consumption.** This view separates the concept of reporting from interfaces or feeds that are intended to transport data to other systems. A report such as a spreadsheet can be consumed by another system, but in doing so, the spreadsheet loses its definition as a report.

Modern transactional user interfaces also present data intended for direct human interaction [including consumption] and have advanced far beyond record-at-a-time presentation of data. Modern transactional interfaces have channels, charts, and scroll bars. This makes the boundary between the presentation of transactional information and a report hard to define. If a display allows entering data for modification of system records, it is not a report. However, the user’s screen may display a report in another part of the same window at the same time.

Reporting cannot easily be defined by its toolset. Some tools such as Cognos Business Intelligence should not be used for interfaces and other non-reporting purposes, but other tools such as PS/Query or App Engine readily serve reporting and non-reporting needs.

Reports may be static documents that are generated in batch by scheduled processes and produced as spreadsheets, PDF, or other files, but reports can also be delivered across a spectrum from printed documents to e-mail messages or attachments. Reports may also be dynamic displays of textual or graphic information possibly “driven” by an on screen form accepting values that control what information is displayed. Dynamic reports might be easily manipulated by the user involving “drag and drop” operations or simple “one click” transformations from tabular to graphic presentations of data. Reports might be delivered as spreadsheets, PDF file or XML files for further manipulation, storage, consumption, or other purposes. Reports may be generated on schedule, on demand, or when something changes or when target values are reached [event-based reporting].

3.0 **Report Data Sources**

Until recent times, transactional system interfaces have almost exclusively presented and consumed
information associated with a single database. The recent evolution of portal technology has dissolved that distinction. Reports, as well, can exist in collections that have multiple data sources including new hybrid reports that present data from more than one source in a single view [perhaps even a single row].

Data warehouses exist primarily to facilitate reporting and archiving. Warehouses draw from multiple transactional systems and arrange and tune the data specifically to facilitate ease of use and rapid reporting.

Transactional system data storage is also an important source of data for reporting. The most common reason to “source” reporting data from the transactional data store is the need for up-to-the-minute information. However, other reasons abound such as the need to confirm the accuracy of data in the transactional system, the need to represent the data as it is stored in the transactional system, or the fact that some transactional system data may simply not be available from warehouses or similar repositories.

Just as data repositories do not exist at a single level in an organizational hierarchy, reporting does not either. Most storage systems from central ERP to facilities management to student advising require some sort of reporting. In recent years, with the emergence of portal technology, the need for separate user interfaces for each of these systems has subsided. Now, with portal “personalization”, a single portal can deliver reports from many source systems at all organizational levels. Furthermore, with custom channels, the systems that deliver information to one user do not have to be available to all. Each can have a custom user experience interacting with and seeing reports from data systems of choice for that user.

4.0 Inventory of Current and/or Future Reporting Tools

A number of tools exist that have been used and/or should be considered for report production at the University. Some exist exclusively for that purpose and others do not. Some are regarded as “legacy” and others are new. Some are the "best fit" in a particular circumstance and almost the worst fit in another. Deciding when to use which tool is challenging.

Cognos is the University’s chosen Business Intelligence (BI) tool. This is the tool the produces the official financial statements for the University. Reports are generated based on selected metadata, a layer of information that is defined between the reporting tool and the actual database schema. Metadata is not typically defined over transactional data systems. Therefore, there is a close affinity between Cognos and the Central Information Warehouse (CIW). Other warehouses exist across the University at the campus level that provides data sources for Cognos.

Two reporting tools exist within Cognos. Report Studio is a powerful reporting tool that puts report design in the hands of designated report developers. Query Studio is a tool that puts design in the hands of the information consumer. It is fair to say that more complex reports can be generated with Report Studio, but Query Studio is the best choice for ad-hoc information gathering so that users may avoid the need to wait for a specific report to be designed.

PeopleSoft [PS] Query is an Oracle-delivered “PeopleTool” reporting tool for the transactional systems. It has a user interface in the PeopleSoft application or portal to allow definition and execution of reports.

BI/XML Publisher [XMLP] is another Oracle-delivered PeopleTool for report filtering, sorting, presentation and formatting. It is not a query tool; it is used to generate reports from an XML data source. The source of XML data can be PS Query or any other means that generates an XML file or doc object. XMLP can deliver reports from XML files or objects derived from either transactional or warehouse sources. The PeopleSoft user interface provides navigation to execute XMLP Reports.
SQR [Structured Query Reporter] is a programmatic language for reporting and data manipulation that has been used extensively with PeopleSoft applications in the past at the University. These reports are being converted to BI/XML reports as part of the upgrade.

Other tools that use an ODBC connection to the CIW include Hyperion’s Brio, Microsoft Access, Excel, and Word. These tools are expected to be used widely to report from campus-controlled data sources.

5.0 Report Development Strategy

The value of a reporting strategy document lies in establishing a common basis for determining when reports are needed, who they serve, who should create and maintain the reports, and how the reports should be produced and delivered. Determining how reports should be produced encompasses identifying data sources, appropriate reporting tools, and design and usage plans for the report.

5.1 Is the proposed report needed?

The process most likely starts when someone identifies a need for information to make a business decision, usually on a periodic basis, and finds that the information needed to support the business decision is not readily available or not properly organized. This request is usually internal to the organization, but can come from outside, such as from a regulatory agency.

5.2 Who is the user community?

Assuming no good alternative to a report appears to exist … who might need the apparently not-readily-available information? Could the information be useful to a larger audience than originally thought? Could it be useful to several departments or shared across campuses? Of course, there are many details such as whether a wider audience could agree upon a common report design or common methods of delivery. Identifying the audience affects not only design, but mechanisms for distribution and assignment of authorship. Sufficient analysis must be done in order to ensure that we are not creating redundant reports for specific departments or campuses.

5.3 What is the sensitivity of the data with respect to security?

Much of the data commonly delivered requires some form of authentication and authorization to ensure delivery to only intended parties. Once the audience for a planned report is understood, knowledge about which systems the audience members are permitted to use may affect delivery strategies for the information. Sometimes new authorizations must be granted for some audience members or a different or additional delivery mechanism must be chosen so that all members may have access.

5.4 What seems to be an appropriate method of delivery?

Once an audience has been identified, is there agreement on a common method of delivery or is more than one means of delivery needed? Should the information be presented “automagically” in a portal channel? Does it require interaction immediately prior to production such as selecting filter criteria on parameter forms? Might there be interaction with the data after initial delivery such as drilldown or cross-tab manipulation? Is the needed information suitable for nightly batch production? Would consumers prefer to retrieve the data in a format such as PDF or XLS? Should there be email notification that the information is available for retrieval?

5.5 Who should author the report?

Answers to all of the above questions may impact reporting tool choices and the report author. Once the general bounds of the required information are known, the audience is understood, and security
requirements and delivery means have been considered, an appropriate “owner” for the report development and maintenance can be chosen.

It is desirable to try to find an appropriately skilled author who can develop and maintain the requested report for the widest possible audience and minimize duplication of effort that would exist if very similar reports are written for different organizational units that have an almost identical reporting requirement. This does not mean that report authorship should be centralized. If the report is widely accessible across the organization, it should not matter if the author is in one of the organizational units needing the information.

The following list of additional criteria should be considered in helping to determine the appropriate report author:

1) Complexity of the needed report
2) Similarity to other reports
3) Report data source or sources
4) Reports that may be audited

5.6 What tools to use for report development?

The strategy for reporting tools is to make tool choice, simple; and not to complicate the strategy by dealing with every possible exception to the common cases. It has been described as “the 90% solution.” There are exceptions and the project will deal with the exceptions as these arise.

The illustration below is an example of the thought process you can follow to determine which reporting tool can be used to support your report development needs.
6.0 Ad Hoc Reporting

Ad hoc reporting is a special category of reporting in which the report development occurs immediately before first use. Often, reports are created for “one time only” use, but this is not a necessary characteristic of ad hoc reporting. Ad hoc reporting puts the ability to immediately analyze certain data in the hands of properly skilled end users rather than having to request, schedule, and wait for completion of efforts by professional report developers.

There are limitations and penalties associated with ad hoc reporting. Not all types of result sets and reports can be generated by ad hoc tools; some may require professional report development. The professional report development process should always involve result testing by subject matter experts.
experts other than the report developer. This testing process is intended to confirm that the report functions well in all tested conditions and always delivers accurate, complete, and unambiguous information. Successful completion of testing is necessary before putting reports into production. When in production, the reports carry the equivalent of a “seal of approval.”

7.0 Known Strengths and Weaknesses of the Reporting Tools

This section provides information about the known strengths and weaknesses of the various reporting tools. It provides valuable information to help make a reporting tool choice for any given set of circumstances.

7.1 Cognos

Cognos provides two tools for reporting: Report Studio and Query Studio. Some information about strengths and/or weaknesses is common to both. Cognos is a “business intelligence” reporting tool designed to provide exemplary functionality, performance, and ease of use when reporting from data warehouses such as the CIW. It is designed and tuned to work with table relationship designs specifically found in data warehouses and similar sources. Cognos will not be used to report from the transactional system.

Although authorship of Cognos reports may be distributed, storage of report definitions and audit records of report execution will be centralized. Report definitions can be copied and shared among multiple authors. Production reports can have user communities of any size across organizational boundaries. However, the University Cognos license limits Cognos users to the faculty and staff community (i.e., not students, parents, alumni, etc.). However scheduled reports may be generated and saved in PDF or other formats for distribution to a larger audience.

Cognos exposes a metadata layer above one or more physical database sources. Report developers view the metadata layer as if it were actual logical columns of data in a single reporting source. The logic of table joins is effectively hidden from the Cognos report developer or user. Reports can often be developed by simply choosing apparent columns of data to place on the report “canvas” without regard to the fact that the columns may come from different tables that must be joined in the underlying database structures. The “work” of joining the underlying tables is done by Cognos for the report developer.

The downside of working with a metadata layer is that if the necessary table joins are not provided in the metadata, a report developer cannot create these. This is not uncommon because it is hard to anticipate all the ways report developers may wish to join data in advance of report development. When such a situation arises, ETL changes must be made and Cognos models must be created or revised to accommodate the needed table joins.

7.1.1 Cognos Query Studio

Query Studio is designed to be an easy to use reporting tool for ad hoc report generation. It is not capable of the broad array of complex reports that may be created using Report Studio, but it puts report creation to meet many business needs in the hands of many authorized end users.

The strategy for the use of Query Studio is not yet fully defined because the University has limited experience with using Query Studio. However, Query Studio is not believed to have features that allow it to produce output that cannot be produced with Report Studio. In other words, it can be said that Query Studio’s features are a subset of Report Studio features.
7.1.2 **Cognos Report Studio**

Report Studio is the Cognos report development tool. Report Studio will be used in an environment involving development, test, and production server instances. This will ensure that production reports deliver accurate, complete, and unambiguous results—a sort of report quality, seal of approval.

There will be centralized version management for Cognos Report Studio. If there is a reason to “roll back” production to an earlier version of a report or produce a new report based upon an older, non-current version of an existing one that will be possible. A QA/Test environment will exist where a limited community of testers can evaluate the accuracy and responsiveness of new or modified reports before they are migrated to a production environment.

Although both Query Studio and Report Studio outputs can be scheduled for execution, all production batch execution of reports for pickup or delivery is expected to be handled by Report Studio [between these two Cognos options].

7.2 **PS/Query**

PeopleSoft delivers PS/Query as a query and reporting tool for all the PeopleSoft applications the University has [FIN, HR, CS, CRM].

PS/Query shares a number of features with Cognos. Authorship of PS/Query reports may be distributed, yet storage of report definitions and audit records of report execution will be centralized. Report definitions can be copied and shared among multiple authors. Production reports can have user communities of any size across organizational boundaries. PS/Query reports can be dynamically run or periodically scheduled.

PS/Query is a powerful query tool but has limited capacity for complex report generation [limited, basically, to simple tabular list reports]. It can be used in conjunction with other tools such as XML Publisher and nVision for more sophisticated report presentation.

7.3 **SQR**

Structured Query Reporting [SQR] language was a popular way offered and recommended by PeopleSoft for report generation prior to the advent of XML Publisher [described below]. It is currently used for many centrally authored reports for PS/HR and FIN. However, this tool is being retired from the PeopleSoft suite due to its lack of technological advancements within the tool itself.

7.4 **XML Publisher**

XML Publisher is not a query tool. It must be used in conjunction with an XML source stream or file generated by a query/reporting tool. This functionality may be useful when a number of related organizations [schools, colleges, or departments] cannot quite agree on a specification for a common report they can all use. Perhaps a single query can be used as a reporting source of data and similar XML Publisher specifications can be used to generate somewhat different reports from a common XML file.

XML Publisher can sort, arrange and display information differently than it appears in the relevant XML file. It can also be used for some complex formatting, like group breaks with aggregation, that does not appear in the source XML.
7.5 Oracle Business Intelligence Enterprise Edition (OBIEE)

PeopleSoft delivers OBIEE as a query and reporting tool for the Taleo system that is used by the University for recruiting employees. OBIEE will be used in an environment involving development, test, and production server instances. This will ensure that production reports deliver accurate, complete, and unambiguous results – a sort of report quality, seal of approval.

There will be centralized version management for OBIEE. If there is a reason to “roll back” production to an earlier version of a report or produce a new report based upon an older, non-current version of an existing one that will be possible. A QA/Test environment will exist where a limited community of testers can evaluate the accuracy and responsiveness of new or modified reports before they are migrated to a production environment.

Although OBIEE outputs can be scheduled for execution, all production batch execution of reports for pickup or delivery is expected to be handled by centrally. Most reports will be run on a demand-basis (as a user needs the information).

7.6 Reporting Tools Using ODBC Connectivity to Data Sources

A number of user workstation tools have been used for reporting that connect to various relational data sources using ODBC [sometimes JDBC] connectivity. Most prominent among these tools are Microsoft Access and Brio. These tools [often called “two-tier”] require specific database sign on and role definition since they connect directly to the database[s]. They typically bypass the other security mechanism in place for access to transactional data or report access, thus must be managed carefully.

8 Summary

Reporting across enterprise and campus-controlled and based data systems, with a range of reporting tools and authors and delivery mechanisms, is complex and requires a strategy for effective implementation.

The strategy defines a report as “always intended for direct human consumption", acknowledging that the potential forms the report may be exposed as are numerous and varied. Reports may be static or interactive. They may be scheduled for periodic execution, produced on demand, even designed on demand [ad hoc], or generated “automagically” when conditions change or events occur.

The suggested strategy for new report development can be summarized as follows:

1) Is the proposed report needed?
2) Who is the user community?
3) Can the report be shared across departments, or even campuses?
4) What is the sensitivity of the data with respect to security?
5) What seems to be an appropriate method [or methods] of delivery?
6) Who should author and maintain the report?
7) What tools should be used for report development?