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DEVELOPING A FRAMEWORK FOR CORPORATE INFORMATION MANAGEMENT

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ABSTRACT:

The fiscal, economic, and social/demographic changes facing higher education have caused the CSU Office of the Chancellor (corporate headquarters) to transform significantly. A consequence of this transformation is that the old ways of collecting and using data are obsolete. The Office of the Chancellor has a major initiative underway to establish a framework for information management which is in concert with the new realities. This paper addresses the desired outcomes of the initiative, the processes undertaken to obtain stakeholder "buy-in" and to develop initiative parameters, the products or deliverables, and the lessons learned.
Wind of Change
The California State University system is comprised of 23 campuses with more than 300,000 students and a teaching force of nearly 17,000 faculty. It is one of the three publicly supported segments of higher education in the state. As the largest senior system of higher education in the nation, the CSU offers more than 1,500 bachelor's and master's degree programs in some 240 different subject areas, a variety of education credential programs, and a fully accredited statewide nursing curriculum. The Chancellor’s Office (C.O.) is the corporate headquarters for this immense institution.

Over the past 30 years, the CSU has developed a full set of governance information systems that have served well. These systems were developed in an era when the primary requirements on the C.O. were to drive formulas for growth and to report on the developments of the system to the State and other external agencies. Increasingly, the executive management of the CSU needs to consider a wide range of alternatives in mapping out its future strategies. While the existing governance information systems continue to provide valuable information, it is time to take a step back and assure that these systems will meet the requirements for the future.

Project Scope
To that end, the Chancellor's Office launched a comprehensive planning and development project to rethink, refocus, enhance, and integrate its corporate information management capabilities. As the C.O. faces the challenges of strategically planning for the future of this great university system, it realizes that its strategic decisions and analyses must be informed and use timely, reliable, and valid data/information which can be easily accessed by, and disseminated to, constituencies both internal and external to the CSU.

The Corporate Information Management (CIM) project facilitates addressing the above challenges by:
• Ensuring that the corporate data are reliable, valid, and timely;
• Ensuring that the information derived from the data is properly interpreted and communicated;
• Providing tools and capabilities to enable C.O. departments to independently manipulate data into information;
• Providing departments throughout the Chancellor’s Office access to the information they need for strategic planning, analysis and informed decision making.
The scope of the CIM project is designed to deal with the C.O.’s corporate data, but not to deal with the operational systems of the Chancellor’s Office or the CSU campuses. For the purposes of this project, corporate data is that data which satisfies one or more of the following criteria:

- It is used in performing a major systemwide role or responsibility;
- It is relevant to the strategic planning needs of the corporation;
- It is needed for corporate decision making;
- It is included in an official systemwide report;
- It is used to derive an element that meets the criteria above.

Any data that is deemed to be operational in nature is considered out-of-scope for project purposes.

**Major Deliverables**

As with any project, a set of deliverables was identified. One of the major ones was to define an overall structure for managing Corporate Information. This consisted of putting into place a structure for managing the Corporate data through a Data Administration function and identifying Data Custodians, managing the technical architecture through a Database Administration function and the use of CASE tools, managing the analytical capabilities with query and reporting tools, and establishing a Chancellor’s office-wide governance oversight function for ensuring data and information quality control.

Other deliverables include developing an enterprise level Corporate data model, defining the requirements for, and establishing, a Corporate data dictionary, and identifying a Corporate technology architecture for the storage and dissemination of the Corporate data. This architecture includes the design, development, and implementation of a Corporate information warehouse with the appropriate hardware and software infrastructure to support it.

The final, and perhaps the most important deliverable is the implementation plan. The plan consists of two phases, an overall planning phase, which lays the foundation for the project, and an iterative implementation phase. The following highlights some of the activities that took place during the planning phase and the tasks to be performed during the implementation phase.

**Planning Phase**

To support the project, a steering committee and a taskforce were formed. They were the Corporate Information Management Steering Committee (CIMSC) and the Corporate Information Systems Task Force (CISTF).
The CIMSC has the ongoing responsibility for the overall planning for the information management and technology needs of the Chancellor’s Office, as the corporate office for the 23 campus California State University system. Within this planning role, the CIMSC is responsible for establishing the principles, policies, guidelines and strategies for management of, and access to, the corporate data managed by the various divisions within the Chancellor’s Office and assuring the quality and integrity of corporate information. The CIMSC is also responsible for establishing the necessary implementation committees and task forces as needed.

The Corporate Information Management Steering Committee is comprised of senior representatives from each of the primary business divisions within the Chancellor’s Office: Academic Affairs, Business and Finance, Human Resources, General Counsel, University Advancement, and Information Resources & Technology.

The goals of the Corporate Information Systems Task Force are to identify and define the information requirements of the enterprise, determine the strategy that the Chancellor’s Office should use in developing its corporate information warehouse, and drive the acquisition and development of the information technology required to support the corporate information infrastructure on a continuing basis.

The members of the task force have substantial expertise in the functional information requirements of their units. Each of the divisions represented on the CIMSC are also represented on CISTF, plus other subject-matter experts as required. Although the Information Resources and Technology staff play a large role in the project’s implementation, project ownership resides with the Chancellor's Office.

Once the committees were in place, several joint CIMSC and CISTF facilitated planning sessions were convened in order to document functional roles and responsibilities, develop guiding principles, and identify major data categories (subject areas).
The initial task was to document the functional roles and responsibilities. A corporate function model, shown below, was created.

![Corporate Function Model]

The model depicts, at a high-level, the major functions the Chancellor’s Office performs and require access to corporate data for strategic planning and analysis, decision making and systemwide reporting. It served as the framework for identifying and defining each function’s roles and responsibilities and the corporate information required to support those responsibilities.

In facilitated planning meetings, management and staff from each division mounted an effort to define the systemwide roles and responsibilities within their area. They focused on the systemwide tasks they performed and asked themselves: What are the strategic planning activities; What corporate decisions need to be made; What are the systemwide reporting needs? Their answers to those questions were synthesized and resulted in identifying the six systemwide major roles and responsibilities performed by the functional divisions of the Chancellor’s Office:

- Acquire/Allocate Dollars,
- Planning/Policy,
- Facilitation/Service Delivery,
- Coordination,
- Accountability/Monitoring,
- External Relations.
As a by-product of the exercise, the participants were also able to identify the major data categories (subject areas) which were of interest to them. The categories were further refined in the implementation phase. The data categories identified were:

- Financial Assets: Budget, Expenses, Fund Balance, Liabilities, Revenue;
- Physical Assets: Construction, Facilities, Space;
- Curriculum: Courses;
- People: Alumni, Applicants, Faculty, Students, Other Employees;
- Other.

The final outcome of these planning sessions was an agreement as to the overarching or guiding principles against which the Corporate data requirements would be held up to. A "straw man" list that had been previously prepared was reviewed and debated in the sessions. The guiding principles that were agreed upon are:

- Data collected and maintained should be no more than that required to perform the functions established by senior management of the Chancellor's Office.
- Corporate data should be collected once, electronically, at their source.
- Integrity and validity of data should be assured at the time of collection.
- Data will be collected in accordance with deadlines that are timed to support systemwide reporting requirements.
- All data will have common, consistent definitions.
- Data will be easily accessible by all authorized individuals who need it to fulfill their responsibilities.

After the formal planning sessions, there were many planning meetings related to how to move forward, how to collect data needs, the format for the facilitated data requirements sessions we planned to hold, finalizing the implementation plan, etc. These meetings usually involved one or more members of the task force and provided for a lively exchange of ideas and opinions. The outcome was an approach for identifying, at a very high level, the data needs of the C.O.’s functional areas and the implementation plan.

A matrix was used to gathering the high-level data needs. It listed the major data categories and sub-categories across the top and each functional division and department down the side. This matrix was sent to departmental representatives to fill out. They were asked to indicate which category of data they either created, collected, or used and what the source of the data was. The replies were consolidated into a master Data Requirements Matrix that was used in the implementation phase.
A series of presentations was given to all Chancellor’s Office staff. These presentations provided information about the CIM project, how the staff might be impacted, and how the project fit into the grand scheme of other C.O. Strategic Initiatives.

Implementation Phase
In order to better manage the project, its implementation will take place incrementally. The major data categories identified above form the basis for each increment. The selection of the data category to implement is determined by the Steering Committee. The following outlines the steps taken during the implementation phase for each increment.

Data Category Analysis
The initial task is to perform a data category analysis. Using the master Data Requirements Matrix as a guide, all of the functional departments using the target data category in some fashion are contacted. Interviews are held with each department’s management and key staff to determine what external or systemwide reports are prepared or used, what the sources of their data are, and whether the data used is operational or corporate in nature. Any issues they are having with the data, e.g., timeliness, integrity, etc., are documented, and any new data category needs are identified. In addition, copies of all reports and documents that are considered to be corporate in nature are solicited. After interviewing the functional users of the target data, findings are summarized. The findings are then reviewed in an interview with the management and staff of the department primarily responsible for collecting the data category. Attempts to resolve issues are made at this time.

All of the accumulated information is then consolidated into a set of working documents. The set includes:

- A summary level report matrix listing all of the identified reports, a brief description, whether the report is mandated, its data sources, its users, and its data custodian(s);
- A detailed level report matrix listing all of the data elements contained in each report or document;
- A data element dictionary that contains, from each report or document, every data element in the target category with its definition.

These documents, plus some additional materials, are used to create the workbook used in finalizing data requirements.
Finalize Data Requirements
A JAD approach was chosen to finalize category data requirements and resolve any outstanding issues. What is JAD? JAD is an acronym that stands for Joint Application Development. It is a facilitated, structured workshop where people come together to plan, design, and make business decisions regarding corporate information. All staff participating in the interviews are invited. The goals for the JAD are to:
- Identify data/reporting requirements by constituency;
- Validate/measure the requirements against the Guiding Principles;
- Validate/associate the requirements with the major Roles and Responsibilities;
- Prioritize the requirements (needs vs. desires);
- Resolve issues and assign action items;
- Establish an on-going process for data definition, refinement, and validation;
- Agree upon the next steps.

After the sessions, all of the items in the JAD working document are updated to reflect the decisions made. The final document is then circulated to all the participants, for approval. Follow-on activities include standardizing data element definitions, mapping the data elements to their source systems, and identifying levels of summation and aggregation.

Construction
Once the JAD related tasks are complete, the design and construction of the corporate data warehouse increment can begin. The construction phase encompasses the following:
- Updating the Enterprise and Corporate Data Warehouse data models. These models identify graphically, the entities and their relationships to each other. The warehouse data model shows us the logical design of the warehouse as well as the data (facts) to be stored and the various permutations and aggregations (dimensions) that data can take;
- Updating the Enterprise Repository with the data element information. In addition to the data element’s physical characteristics, the Repository stores information about the element’s source system, data owner and custodian, derivation rules, aggregation levels, etc.;
- Creating the physical design of the data warehouse. The data modeling tool generates the database definition, but changes must still be made based on performance issues;
- Loading the data warehouse from the source systems;
- Assuring that query and reporting tools are put into place;
- Training end users on how to access the warehouse and interpret its data. Custom queries and reports are provided, as well.
Progress to Date
The initial data category was Financial Assets. The reasons for selecting it were several: a major change was taking place in the way the campuses would be reporting their financial data to the Chancellor's Office; the project that would implement the change was well underway; the project includes using a database to store the collected financial data; and the CIM project would provide a mechanism for validating the design of the database.

End users of Financial Asset data were interviewed and their reports, documents, issues, and new data needs registered. This information was synthesized and presented to the Accounting Department during their interview. Most of the outstanding issues were addressed and resolved by meetings with the impacted departments. The JAD sessions were held with great success. During the sessions many activities took place:
- The new data needs "wish list" was reviewed and acted upon;
- The summary report matrix was reviewed and refined;
- A consensus was reached on all outstanding issues;
- Data custodians were identified
- "Tiger teams" were formed to address action items

Upon conclusion, the working document was updated to reflect the results of the JAD sessions. It was sent to all participants and approved, as revised.

Follow-on activities are proceeding according to schedule. Meetings were held with data custodians and end users to standardize the data element definitions, derivation rules, required aggregation levels, etc. The data model for the warehouse is stable and the Enterprise Data Warehouse and the Data Repository are both under construction. Also, plans are being made to begin the category analysis tasks for the next data subject area.

Lessons Learned
The CIM project has indeed been a learning experience and will continue to be so. The lessons learned have been positive and will contribute to doing a better job when working the other data categories. The more salient ones are:
- It will take longer than expected;
- Gather as much information as possible when interviewing – probe, probe, probe;
- Many issues can be resolved off-line by bringing the affected parties together;
- Differing sources of the same data provide differing results;
- People are protective of what they do, there is resistance to change;
- Use an impartial, third-party facilitator for the JAD sessions;
- It is difficult to separate corporate from operational data.
Needless to say, there will probably be more lessons as the other data categories are addressed. We will continue to refine and improve the process.

**Conclusion**
The CIM project has been a worthwhile experience. For many, it's the first time that a divergent community of data users has come together to discuss issues and resolve common problems. The general consensus is that the Chancellor's Office is on the right track to address the issues that chartered this project in the first place.