3.2 ISIS Integration

Major Issue: The introduction of the Integrated Student Information System (ISIS) suite of tools and supporting technologies represents a significant disruptive technology event that replaces aging systems, provides modern technologies and data structures, provides additional enterprise tools, and represents an opportunity to greatly improve the administrative services required to support university students. This change and the opportunities it provides come at a time of deep resource limitation felt at a state and national level. The challenge for this strategic planning cycle is to recognize and identify priority investments that create an agile, participative data application environment supporting key student services, while enhancing students’ educational experience and enabling campus objectives amidst the turmoil of change and economic constraint.

A. Background/Rationale

ISIS is the emerging Integrated Student Information System for the university. It includes Oracle Peoplesoft’s Campus Solutions, Constituent Relationship Management (CRM system), Master Data Management, the enterprise portal for services, and a new student data warehouse and related enterprise class data reporting system. It also includes an integrated document management system, a degree audit system, and underlying software systems for integration and workflow. This system represents a transition to Oracle enterprise products for human resource, accounting, and student information purposes.

ISIS is managed by University Information Systems for all campuses and academic units of the university. The ISIS systems are the culmination of a large, multi-year project to replace the legacy Student Information System that served the campus for more than two decades. The admissions modules of ISIS went live in the Fall 2009, with full implementation scheduled through 2010.

On the Boulder campus, there are at least 50 campus application systems and likely many more that extract data from or feed data to ISIS. These systems vary in size and complexity. Examples include learning management systems, Library catalog and resource systems, Housing and Buff OneCard systems, Parking Management, International Education systems for study abroad students and international students on campus, Student Advising in Arts & Sciences, several interfaces to federal systems to meet federal reporting requirements, and many more in academic and administrative units. These systems are supported by Computer Support Representatives (CSR’s) who are departmental personnel and departmental IT system managers. These departmental systems help departments meet their mission responsibilities using traditional extract and load technologies that are not often secure or timely. ISIS presents opportunities to improve and modernize the integration of campus systems.

In the next two years, the university will face extraordinary budget pressure to both be more efficient and to look for revenue other than from State appropriations. This implies that improved business processes and increasing staff efficiency are important contributors to improved student services. Faculty, and other important constituents of the university including parents, alumni, high school counselors, international education, 3rd party counselors, potential transfer students, are also impacted. The university will find itself in an even more competitive environment for recruiting the kinds of students needed to meet its mission and goals. The university will also have to adapt and fine-tune student processes and data assets that have been in place for many years.
The Campus Flagship 2030 strategic plan has a number of academic and business drivers that ISIS must meet along with the integration of campus systems. A few highlights are given here that are pertinent to ISIS and ISIS integration

- Increase uniformity in administrative processes among campus units where efficiencies can be gained or services improved
- Increase graduate student recruiting and retention
- Support new kinds of graduate level master and certificate programs
- Support students at distant, or enrolled in other, collaborating universities
- Increase international student recruiting, retention, and study abroad opportunities
- Enhance revenue
- Increase efficiencies of staff, their access to, and use of, computing technologies
- Support new kinds of educational programs and offerings through new, innovative housing models

A. Explicit Assumptions

1. The campus will largely react to changes introduced by the ISIS project for the next year or two. Strategic execution and thinking will be limited as the campus develops new processes and learns to effectively utilize ISIS tools. Much of the tactical deployment of strategic objectives is thus more likely to be seen in years 3 and 4 of this planning cycle.
2. The university has invested in and will rely heavily on Oracle PeopleSoft to provide rich features and services that enable university priorities and direction.
3. The university will stay current with Oracle’s changing technology and upgrades. This maintains a viable system but requires appropriate levels of staffing and attention.
4. The university will adopt business and IT practices that support the efficient application of software upgrades, patches, and releases. This includes adapting business process and staff training to conform to vendor distribution cycles and an investment in software testing and quality assurance processes to manage the impact of software change.
5. The university will continue the central tenet of the ISIS project to minimize customizations to the systems. Minimizing customizations maximizes the integration contribution of the system and accommodates frequent upgrade cycles. This does not preclude supportive extensions, but suggests a strong value proposition is necessary and that process modification is an equally viable consideration.
6. The university will continue to make an investment sending staff to the Higher Education User Group for PeopleSoft products, and other important user associations and events. Active participation by university personnel will influence product improvements that are important to CU and keep key personnel well informed of upcoming changes.
7. New integration methods will allow for a high degree of reuse of data services. The university will use standard, canonical data services, supplied by Oracle, facilitated through “middle-ware”, or developed by the university. “Standard data services” describes common, well-defined collections of data readily available for use by other systems.
8. Departmental systems will conform to the university and Oracle standards for integration and will commonly use Web based, service oriented approaches.
9. In the late 2011 to 2012 timeframe, the university will start to expand use of the ISIS systems, especially CRM for student retention and other strategic areas.
10. The demand for integrated workflow between systems will continue and even increase.
11. Pressure arising from the need for more cost savings will encourage more use of central systems.
12. The need for agile, quick responses to specific needs of departments will continue. The innovative, entrepreneurial nature of departments will continue. Easily accessible technology services, such as cloud computing, will offer opportunities for departments to be innovative service providers.

13. Data and identity protection will continue to be a vital requirement for the university. Management of access to data will continue to be a policy and procedural issue.

14. Effective identity management will continue to be a critical need, driving certain IT initiatives. University-wide identity management is a necessary component for effective ISIS integration. Most services and techniques depend on an accurate and transparent understanding of persons and their relationship to the university and/or campus.

15. IT Governance (decision making) will mature and support the need for cross-department coordination of IT development and support. IT Governance will provide a forum to make optimal decisions related to acquisition or development of departmental systems. IT Governance will improve service relations between departments and central IT units.

B. Specific Recommendations:

1. Pursue Technology Initiatives To Achieve Effective ISIS Utilization and Resource Efficiencies
   
   A. Maximize value from the investment in the ISIS Project. Take advantage of ISIS integration and the investments made in ISIS to meet campus business needs. Examples to consider include:
      1) Expand the use of the CRM system from student recruiting to student retention.
      2) Use the CRM system for other business needs that require better communication, service, and follow through with constituent groups.
      3) Utilize the new document management system more broadly.
      4) Develop the workflow software and integration software for campus and departmental business needs.
   
   B. Implement automated workflow with the capabilities of the new workflow software and related products.
   
   C. Provide for “real-time” and event-driven services.
   
   D. Invest in skills and cooperative development models to foster effective use of ISIS technologies and data in central and departmental technology organizations. Develop business process analysis, modeling, and design competencies.
   
   E. Encourage the development of additional features and services to meet business needs. Define, publish, and support development architecture and effective life-cycle management for ISIS technologies.

2. Make Meaningful Data Available Through Data Services Standards and Approaches

   A. Move toward developing a set of standard web and data services that combine data from ISIS and other source data systems.
   
   B. Produce data models and information architecture to support integration efforts.
   
   C. Participate in a robust identity management methodology and master data practices to provide reliable, up-to-date, accurate records of persons and their relationship to the University. This is an essential enabler for many ISIS technology objectives and an integrated systems environment.
   
   D. Minimize duplication of effort and provide uniform data accessibility while providing abstraction from the component technologies and their dynamic changes by utilizing Web Services approaches and standards. Standard services can reduce interface
duplication, promote consistent and predictable integration, and provide a stable buffer between campus systems and ISIS change cycles.

E. Advance privacy and protection of data while pursuing these data initiatives

3. Establish Service and Governance Initiatives To Provide Direction, Clarity, and Opportunity

1. Consider and investigate opportunities to replace campus systems (such as fsaAtlas or Apply Yourself) where ISIS provides sufficiently similar functionality. Utilizing ISIS functionality provides cleaner integration, eliminates redundant license fees, and reduces data duplication and exchange.

2. Establish clear decision making forums and utilize the new IT governance processes to help manage and clarify priorities while directing funding towards optimal campus investments.
   1) Create an approach for defining and developing optimal web services and data services. This includes a governance process that supports co-development and an “architecture of participation” that enables solutions and defines responsibilities and expectations for all providers.
   2) As part of IT governance, create a data governance process to support better utilization of all ISIS related data assets.

3. Develop a service model that encourages co-development of new services that takes advantage of the distinctive capabilities of personnel from UIS, ITS, and campus departments.
   1) Improve information, documentation, and training for campus department IT staff.
   2) Clarify responsibilities so that campus departments can easily identify contextual contacts for ISIS information.
   3) Provide an “application manager” for each of the major application areas of ISIS. This person will have in-depth knowledge of the application and can help departments determine the best way to use the application to meet business needs or integrate with the departmental system.
   4) Provide additional campus contextual documentation and training for the ISIS system.
   5) Keep departments informed of upcoming changes in the new software releases for ISIS.
   6) Establish a registry or catalogue of services and departmental applications with ISIS interfaces or integration. Encourage departments to select existing university or campus solutions before purchasing potentially redundant application systems. This will help identify existing integrations and interfaces, minimize duplication of effort and data, and promote effective service deployment.
   7) Develop a process that allows departments and providers to develop enterprise quality business solutions that can be used by other departments and organizations and become part of the campus portfolio of services.
   8) Establish a structured communication process between departments, ITS, and UIS.
   9) Encourage cooperative and positive collaboration to meet departmental needs.
   10) Adapt service delivery environments to a rapidly changing, dynamic social technology expectation
   11) Increase service windows and support for international services (language, cultural, legal environment considerations)

4. Encourage primary reliance on university wide reporting tools and the data warehouse for data reporting purposes.
1) Develop supportive training and utilize key providers (such as Registrar services and Institutional Research offices) when possible to eliminate redundancy, provide expertise and consistency, and assure a level of data integrity.

2) Support methodologies to integrate and make campus or departmental data sources more widely available through these tools.

C. Short/Long-term Objectives

1. The university must strengthen the initiation and development of relationships with prospective students, enrolled students, and graduating students as well as family members, alumni, and community members. Effective, positive relationships between the university’s wide ranging constituents and administrative services will help meet recruiting goals, improve retention, and improve the overall experience of students. ISIS systems will help the university meet these goals, particularly by extending the use of integrated elements such as the CRM system and data warehouse. Real-time integration between ISIS and campus systems improves service and information quality.

2. The way the university uses technology for communicating and interacting with students must be flexible and must be extensible to take into account ever changing communication technologies. The newer generation of students will be much more agile with how they use communication. Their expectations will be higher that the university can match the way that they communicate with their peers and others. This can be said in another way – the university must offer multiple channels of communication so that we can ask students “how do you want to communicate with us”; not tell students you must use these channels.

3. The university needs a much better way to support all students in a responsive and efficient manner, such as students experiencing academic or personal difficulties (students of concern) and for a multitude of student retention goals. Identifying and supporting such students requires a comprehensive view of student information, including academic performance, administrative support, and extra-curricular activities. To support objectives of organizations such as the Division of Student Affairs to facilitate immediate assistance without excessive “assistance shopping”, heavy reliance on strong integration and comprehensive information availability is necessary. “No wrong door” processes are better supported by technology (such as the ISIS CRM functionality) when the processes and data are supported through standardized, integrated methods.

4. Improve the integration of campus-based systems with ISIS. Reduce the cost of maintaining interfaces while improving the integration with more real-time data and event driven processing, improving data integrity, and reducing security risk.

5. Develop a useful and well understood IT architecture for integration. This architecture can provide a small collection of standard data services that are well documented, and that can be used by departments to develop additional, innovative services to support specific business needs. The use of defined methods and processes will take better advantage of distributed campus IT skills and will assist in developing the IT community into a self-sustaining and robust set of expertise. University IT organizations, with product support from Oracle, can define an enabling IT architecture for building innovative extensions to ISIS. Architecturally compliant solutions can in turn become university-wide solutions, not merely local point-solutions.
6. Comprehend and pursue an understanding of the impact of increased internationalization on data and services. Expanded support windows, additional customer concerns (agents, cultures, regulatory environments, language barriers), and increased clarity in communications are necessary across all integrated services.

D. Possible Risk

Technology Risks:
- The campus may not invest sufficiently in staff, support, and procedural considerations to utilize the ISIS tools effectively or efficiently. Campus training, support, and procedural guidance may lag behind the massive technological innovation ISIS represents.
- There is a high dependency on a single market provider (Oracle) for the majority of university enterprise data and administrative systems. Change processes, disruptive events for the provider, and variation in planning horizons could impact university priorities and services.
- Technological viability is increasingly short as innovation, integration, scale, and complexity of data systems are likewise rapidly increasing. These forces will likely create difficult choices due to economic and resource limitations.
- New event and request driven integration may pose immediate security and privacy concerns.

Strategic Risks:
- Increasing internationalization introduces new procedural and technical strains on student data processes. Service and support windows must increase to support Flagship 2030 goals, greatly impacting the support costs and availability costs for providing data. Legal and jurisdictional issues increase external mandates and demands on data, as do cultural and communication barriers. These factors impact support requirements and costs at a time of massive technology change and poor economic condition.
- Adaptation to technological change requires investment in employee and customer development. In recent years, campus and university staff have found increasing development and training requirements challenging and intrusive to their core activities. Conflict in this area may produce less effective application of ISIS tools towards campus priorities. This is both an environmental and Flagship 2030 strategic risk.

Resource Risks:
- Resource constraints are tight given national economic and state funding externalities. An increasing dependency on technology and increased service window will be challenging in the current economic environment.
- The complexity of the new highly integrated systems creates a skills barrier for participation. The flexibility presented will demand skilled resources many individual departments do not currently have and cannot afford to pursue without reallocation of existing resources.

Environmental Risks:
- Organizational, process, and workflow design may not adapt as quickly as technology change requires, reducing effectiveness of the technological investment.
- The intense focus brought to the ISIS implementation and enterprise development environment may be difficult to maintain during the years immediately following initial implementation. This could interfere with opportunities to put tools with limited or targeted scope in ISIS (such as CRM and Document Imaging Tools) into more pervasive use as recommended.
5. Resource Allocation

1. No additional enterprise level technology investments of a significant nature currently appear necessary to achieve the stated recommendations and objectives of this report.

2. Much of the additional cost of ISIS integration comes in the development of services, standards, methods, training, and procedure. The actual allocation for this may be possible in large part to a “reallocation” of departmental resources that are freed up due to ISIS capabilities. Otherwise achieving the service windows needed and the process integration implied represents a significant investment in skilled human resources. Implications include the following considerations:
   a. Accommodating a shift in service away from simple departmental tools to enterprise architectural approaches represents a reallocation priority. New and robust technology will require new investments and constrain out-of-date and less serviceable approaches. Funding and skills allocation challenges follow.
   b. Smaller departments and more isolated organizations with integration needs may require representative technical services more than in the past due to the integration and additional complexity of the new system and its underlying data structures.
   c. Target service windows are multiplicative, not additive, to service resource requirements. Support that could be managed by one or two persons will require as many as five or more skilled support staff as service windows increasingly approach 24 hour, 7 day requirements.

3. Development and integration technologies will require shared resources with high availability or additional investment by those organizations that choose to pursue their own integrations. The development environment, tools, and techniques are markedly different than in the previous data environment. This may represent a cost burden such organizations are unaccustomed or unprepared to accept.

4. The recommendations of this report cannot provide the intended efficiencies or effective processes without due investment in process, roles, and skills. Technology alone is insufficient to create efficiency or effective solutions.

6. Responsible Parties

- ISIS vendors, Oracle, other business partners
- Shared data repository custodians at the department level
- Central system-wide IT, UIS
- Campus-wide IT providers and service organizations (ITS)
- Owner, Stewards, Custodians, and end-user consumers
- Business line or functional process parties impacted by, dependent on, or providing to ISIS

7. Evaluation

How will we know that we are successful?

- Campus departments have a well defined process for requesting and receiving ISIS support and services.
- Computer Support Representatives (CSRs) express satisfaction in being well informed about ISIS and changes to ISIS.
Innovative development of new services still occurs but using a well-conceived architecture for extending the services of ISIS. Services can be built relatively quickly using standard data services approaches.

UIS supports a small number of standard services instead of many custom services that are expensive to maintain and support.

The campus has adopted a common, comprehensive relationship management approach. This approach supports a system for collecting and monitoring student activities, and provides much better communication and follow-through with students.

Campus departments will have access to an up-to-date registry (catalog) of services and applications. Decisions to acquire new third-party systems are be based on a careful evaluation of available CU services prior to new acquisitions.

The Registrar will have an up-to-date inventory of all systems on campus that contain student data.

The protection and privacy of student data continues to be a top-level priority and is well understood by all departments. Policies will be clear, up-to-date, and followed.

The university is using a common, comprehensive identity management system to support security policies and procedures, as well as providing a common, trustworthy source of data for personal identity and affiliations.

Departmental systems that were built for data reporting purposes will be reduced and replaced by effective use of the new university-wide data reporting tools and data warehouse.

The Registrar’s office (and other central IT units, including Institutional Research) provides a standard set of queries and reports that provide a high-degree of reliable and accurate student and trend data.

The central data warehouse architecture meets greater than 90% of all campus reporting needs.

Campus recruiting goals are achieved utilizing ISIS data systems.

Retention processes are defined and ISIS data will demonstrate measurable positive achievement of retention goals.

Services or service prototypes exist supporting the latest social computing or technology devices.

“Student of Concern” processes depend heavily on ISIS data and integration services.

Total cost of data access for departments is measurably less due to ISIS data services.

The defined integration architecture is also the architecture of choice for campus developers.

Upgrade schedules, testing requirements, quality and training standards for the development of ISIS integrations are defined and available to all potential providers.