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Foothill-De Anza

Integration Architecture and Planning Report

Prepared: December 8, 2008

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SunGard Higher Education

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Executive Summary

During the week of November 4th – 6th, 2008, SunGard Higher Education conducted an Integration Architecture and Planning Service onsite session at the Foothill-De Anza Community College District (FHDA) campus in relation to the institution's implementation of their Unified Digital Campus (UDC). Components from SunGard Higher Education include Banner Student, Financial Aid, Finance, Human Resources, Advancement, Degree Works, Document Management Suite (BDMS, formerly xTender), Luminis Platform, Windstar, Banner Operational Data Store and Banner Enterprise Data Warehouse (ODS/EDW).

The purpose of the Integration Architecture and Planning service is to review 3rd party and in-house applications that integrate with the legacy Student, Financial Aid, Human Resources, Advancement, and Finance systems and recommend integration approaches with the Banner/UDC roll out. In order to implement the Banner system, certain integration strategies must be developed and plans to incorporate them in the project completed. With SunGard Higher Education and the Foothill-De Anza working in partnership, recommendations will be presented on how integration between the Foothill-De Anza systems with Banner will be implemented and maintained as part of this assessment.

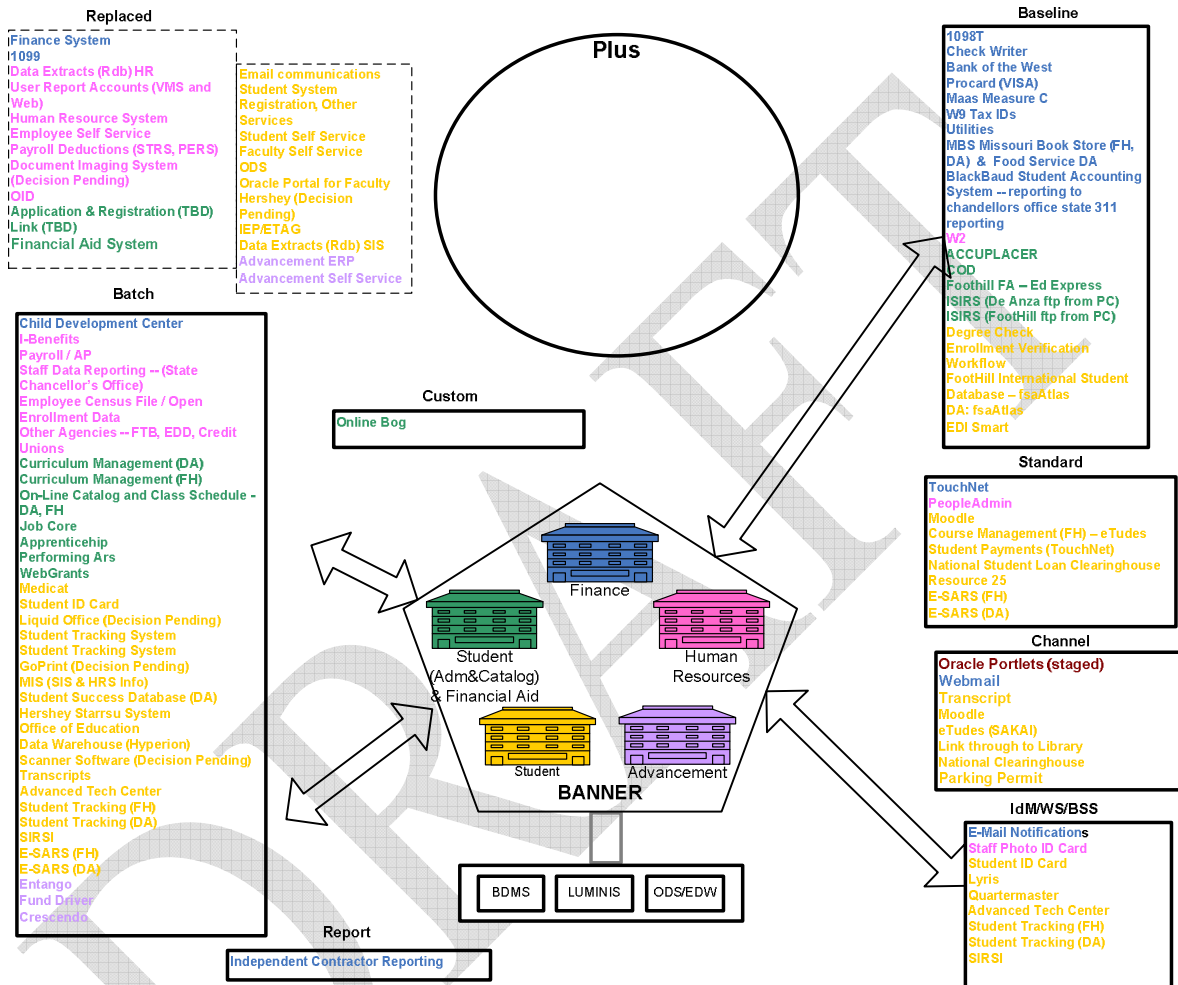
This document presents the findings arising out of the fact-finding and data gathering sessions conducted at Foothill-De Anza, communications with Banner Student, Finance, Human Resources and Advancement consultants along with documentation and input provided by the Foothill-De Anza to date. Recommendations for implementing integration strategies are made as a result of the data gathered during the working sessions, and analysis of this data as impacted by a number of factors, which include:

- Manner of current system interfaces
- Foothill-De Anza Current and Future Integration Strategy
- Implementation of the Banner system
- Interfaces that may be retired or become obsolete
- Designing and building new interfaces/integrations
- Maintainability of interfaces/integrations
- Skill sets of resources that will build and maintain integration

During the onsite meeting, the Application Portfolio Matrix was populated with existing interfaces. The Integration recommendations in this report are grouped into the following categories.

Integration Strategy	Count	Sequence Number
Baseline	24	126, 72, 66, 67, 68, 69, 70, 75, 78, 80, 115, 117, 85, 86, 87, 88, 94, 9, 11, 15, 29, 30, 37, 41
Batch	28	81, 116, 119, 121, 90, 96, 99, 105, 106, 107, 6, 8, 25, 28, 31, 39, 40, 42, 44, 57, 20, 22, 23, 45, 61, 48, 49, 50
Batch/Channel	1	36
Channel	6	127, 128, 130, 131, 132, 10
Custom	1	89
eLearning	4	12, 24, 38, 129
IdM	5	76, 102, 7, 58, 59
IdM/Batch	4	21, 26, 27, 35
Replaced	19	64, 65, 84, 55, 60, 93, 98, 100, 112, 1, 3, 13, 14, 17, 18, 33, 56, 46, 47
Report	1	77
Standard	5	71, 101, 2, 34, 43
Standard/Batch	2	4, 5

The proposed integration roadmap for the Foothill-De Anza UDC after the Advancement Go-Live can be represented in the diagram below:



In summary, SunGard Higher Education recommends that the Foothill-De Anza begin to look at integration from a strategic and institutional architectural design perspective. This approach will facilitate reuse and cost reduction to create and maintain the components necessary to facilitate integration. Foothill-De Anza's integration requirements are most significantly batch with a handful of integrations feeding from the IdM solution. Foothill-De Anza should focus their immediate attention on identifying a common platform for batch integration that leverages existing in-house technologies and skill sets; and solidify an IdM solution that can feed identity information to external third-party applications.

As it relates to the roll out of the Banner Unified Digital Campus, the main integration areas that will take the bulk of the work are:

- Replacement of existing integrations.
- Time-sensitive management and coordination of interim interfaces between Banner, Luminis and legacy systems.
- IdM implementation and its impact on integration and provisioning for the Banner UDC.

Following are pending decisions that impact integration planning:

- Decisions on retirement of software applications.
- Evaluation of Banner functionality for replacement of existing applications.
- Third-party vendor selection and determination of integration effort.

In the short term, SunGard Higher Education is recommending that Foothill-De Anza:

- Take initial steps toward having an institutional integration architecture.
- Utilize existing UDC integration technologies and standard interfaces.
- Train staff on technical skills appropriate for the Banner UDC.
- Establish standards for integration development that follow best practices.
- Select a platform for Batch Integration.
- Leverage IdM solution for synchronization of identity information to external applications.
- Where possible leverage other tools and technologies that could reduce integration workload.

Longer term, Foothill-De Anza should:

- Continue to formalize the FHDA's integration strategy and architecture.
- Where possible leverage other SOA tools and technologies that could reduce integration workload and offer additional control and monitoring of batch file integration.
- Consolidate business processes between campuses to use a single application to gain operational and integration efficiencies.

This document and its associated deliverables are a starting point for the Foothill-De Anza to manage and maintain integration on campus via the roll out of their Banner Unified Digital Campus.

1. Introduction

1.1. Introduction

The goal of this assessment is to provide the Foothill-De Anza with recommended methodologies for completing integration for each system that currently interfaces with the existing student system.

This assessment will provide the Foothill-De Anza with templates to manage existing and future system integration needs.

1.2. Objectives

This document is not intended to be a detailed technical paper on how to use various programs and utilities for interfacing into Banner. Rather, it provides recommendations and methodologies on how legacy systems / operations can be optimally integrated with Banner.

The following objectives will be accomplished:

Approach – an overview of integration strategy dependencies, timeline, design and implementation considerations.

Project Milestones – mapping of integrations into the Banner project timeline.

Integration Requirements and Recommendations – documents results of on-site SCOT and Business Drivers discussions and provides short and long term strategy recommendations.

Integration Roadmap – provides an implementation roadmap for integration.

SunGard Higher Education Professional Services -- lists SunGard Higher Education Professional services that are available and relevant to integration requirements.

Integration with 3rd Party Vendors – lists collaborative partner integrations for applications mentioned during the on-site.

1.3. Scope

This assessment focuses on the integrations identified by the Foothill-De Anza team that currently exist between their enterprise applications. Recommendations around business process improvements, reporting, data mart needs and data migration needs are not covered in these deliverables.

Recommendations provided in this report are based on summarized information gathered during three days of discussions conducted at the Foothill-De Anza from November 4th-6th, 2008 and review of materials provided by the Foothill-De Anza. In addition, there were discussions with the Foothill-De Anza's SunGard Higher Education Student, Finance, Human Resources and Advancement consultants to determine the common integration requirements for each Banner module implementation. The discussions were based on the interface documentation provided by the institution, and current practices and requirements.

1.4. Approach

For any institution, the approach to come up with an Integration Strategy is dependent on a number of factors, which may include:

- Existing systems
- Institution's overall interface / integration strategy
- Implementation of the new system
- Interfaces that could potentially be retired / become obsolete due to:
 - The implementation of new system
 - Management decisions initiating process changes
- Linking the strategy to the Institution's overall Implementation Schedule
- Designing and building new interfaces/integrations
- Maintainability of such interfaces, and,
- Skill set of resources that will design, build and maintain these interfaces/integrations.

Institution's Overall Interface/Integration Strategy

Foothill-De Anza has not yet defined a specific interface / integration strategy but has expressed a desire to move toward utilizing the latest integration technologies available to save time and to leverage what SunGard Higher Education will support to facilitate integration.

Implementation of the New System

Foothill-De Anza is scheduled to go live with SunGard Higher Education technologies as follows:

System	Go-Live Sequence
Luminis	July 2009 w/Employee (In conjunction with Finance)
General	July 2009
Finance	July 2009
HR/Payroll	January 2010
Admissions	February 2010
Student Catalog & Schedule	February 2010
Financial Aid	February 2010
Student Registration/Student Records	April 2010
Student A/R	April 2010
Student Academic History	September 2010
Advancement	January 2011
Degree Works	Spring 2011

Therefore interfaces between systems that exchange information with their third party and home grown systems will need to be addressed to ensure that there is continuity in meeting Institution business and operational requirements.

Linking the Strategy to the Institution's Overall Implementation Schedule

First, certain interfaces could be retired / become obsolete due to the implementation of the new system, which will have the required functionality.

Second, some interfaces could become redundant and hence be retired if certain process changes recommended in this document are executed by the Foothill-De Anza. These recommendations would include providing Banner functional and technical training to the affected users of those systems and providing them with access to Banner for appropriate training on the changed processes. These process changes can significantly cut down on the process time; lessen manual work and limit human interaction leading to fewer errors that can ultimately result in completing a specific function with superior quality. These will be identified in the recommendations.

Several interfaces, specifically in the Student, Finance and HR areas, are typically part of the implementation, and are in the plan to be addressed with the SunGard Higher Education functional and technical consultants respectively. These are indicated as either baseline or standard in the recommendations, and should be confirmed with those consultants during the early planning stages.

Designing and Building New Interfaces

Certain new interfaces may be required. Specific skill sets required to design and build those interfaces will be identified in this document. This document will include recommendations for any new interfaces that will be required.

Maintainability of interfaces in the long run

The interfaces need to be maintained through various hardware and software upgrades and the Foothill-De Anza has to continuously monitor and evaluate the need for maintaining such interfaces over a period of time. If the interfaces are not built by SunGard Higher Education, the Foothill-De Anza is responsible for maintaining and upgrading these interfaces.

Skill sets of the team who will design, build and maintain these interfaces

It is important that the interfaces are designed, built and maintained by people who have fairly good knowledge of the programming language as well as the Domain (functional) knowledge. Considering that Banner is a native Oracle system, it is recommended that Database Scripts / Packages are designed and developed utilizing SQL and PL/SQL. Since some interfaces will be creating files using Banner job submission and Pro*C, Banner General Technical knowledge and Oracle Pro*C knowledge will be required. To use the Batch Integration Framework (BIF), Java programming knowledge is required.

As with other aspects of the implementation such as with the Oracle Portlet Migration, we recommend that SunGard Higher Education consultants do the work for the first use of a technology and train the Foothill-De Anza resources on the methodology and steps for configuration, deployment and testing. Then, the Foothill-De Anza resources can continue to expand the application of the reusable components for additional integrations as the UDC extends to encompass more of the existing and new systems.

2. Project Milestones

Below are the major project milestones that drive the draft integration project plan. At the conclusion of additional critical milestones such as vendor selections or additional training, the schedule can be adjusted as necessary. Integrations are listed in the timeline with the earliest go-live date by associated UDC system.

UDC System	Month	Sequence Number
Luminis	July 2009 w/Employee (In conjunction with Finance)	126, 127, 128, 129, 130, 131
General Finance	July 2009	52, 64, 65, 66, 67, 68, 69, 70, 71, 72, 75, 76, 77, 78, 80, 81, 83
HR/Payroll	January 2010	53, , 55, 60, 93, 94, 96, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 112
Admissions	February 2010	114, 116, 117, 119, 120, 121
Student Catalog & Schedule	February 2010	22, 23, 45
Financial Aid	February 2010	84, 85, 86, 87, 88, 89, 90
Student Registration/Student Records/Student A/R	April 2010	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 54, 56, 57, 58, 59, 61
Student Academic History	September 2010	
Advancement	January 2011	48, 46, 47, 49, 50, 51
Degree Works	Spring 2011	115

Dependent Resources

The integration aspects of the UDC project have large dependencies on people in the following roles:

- Core Committee Members: Define project scope, objectives; provide appropriate resources; make timely decisions on policy and process as needed.
- Integration Owner: Direct project in accordance with integration standards. Owns institutional integration artifacts such as application matrix.
- Technical Team Leaders: Ensure completion of implementation activities; maintain project plan.
- Functional Team Leaders: Ensure involvement of appropriate functional representatives; serve as liaison from project to respective functional area(s).
- Functional Team Members: Complete project tasks under direction of team leaders.
- Technical Team: Support infrastructure; develop and maintain interfaces, adopt new technologies as required.

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3. Integration Requirements and Recommendations

3.1. Business Drivers

During the integration assessment interviews, business drivers for integration implementations relative to the Banner implementation were identified. Foothill-De Anza's concerns centered on streamlining and unifying business processes across the two separate campuses while minimizing baseline modifications and dependency on third-party solutions. In addition, staying within budget, meeting project milestones and maintaining adequate staffing while avoiding staff burnout were primary concerns.

The business drivers are as follows:

Priorities

- Stay on cost budget
- Stay on schedule
- Must be secure (access and data)
- Meet regulatory reporting requirements
- Good/Continuous Communication
- Reduce/Avoid Customizations (vanilla is sweeter!)
- Maintain Data integrity
- Ensure old or current systems keep running
- Have a fallback plan if something doesn't work
- Comprehensive testing (functional, performance, end-2-end)
- Meet all targets/milestones set out to do.
- Good infrastructure to be in place before integration
- Right people involved at the right time

Objectives

- Achieve specialized goals outside of Banner system
- Turn off old systems while continuing in business
- Reduce cost
- Increase efficiency
- Timely access to data
- Data integrity during migration

Goals

- Make the timeline
- Better system - easier for all users
- Reduce or eliminate shadow systems
- Less reliance on 3rd party vendors, i.e., more integrated systems in Banner
- Reduced unique manual processes
- Go paperless as much as possible
- Multi campus-wide buy-in (district-wide)
- Reduced service requests
- Enhanced user-friendly student self-service

What to Avoid

- Staff burnout
- "Unreasonable" expectations
- Loss of backfill
- Loss of functionality and user ease
- Separate campus business practices
- Compromising goals/functionality to meet schedule
- Unnecessary patches / upgrades all start from same version?
- Making modifications
- Introducing security exposures
- Unilateral decisions
- Taking shortcuts
- Avoid making snap decisions

3.2. Integration Business Drivers & SCOT Analysis

From the interviews and documentation provided by the Foothill-De Anza, SunGard Higher Education consultants were able to identify strengths, challenges/weaknesses, opportunities, and threats (SCOT) related to integration at the institution, which in turn, facilitates business process automation and execution.

The Foothill-De Anza team is eager for improvement with top level management support, adequate funding and the right underlying network and security infrastructure for the project. The team is looking forward to streamlining processes, reducing costs and improving services to their constituents. They anticipate challenges as both campuses work toward unifying business processes, eliminating shadow systems and improving communication. As well, they anticipate resource constraints due to the retirement of key personnel and the need to support both the legacy and new Banner system in parallel over the next two years.

The following is relevant to the success of this project:

Strengths

- Good people
- Team players
- Eager for improvement
- Top Level Management Support
- Good network and security architecture to support the change
- Clear objectives
- Bond money
- Subject Matter experts
- User group support
- Good communication rapport

Challenges

- Old legacy system - same for 20 years!
- Lack of technical training
- 2 colleges have evolved differently - apps and business rules
- Many homegrown 3rd party applications (scattered resources)
- Key staff are retiring - may not be motivated to learn new system!
- Limited staff - all have large current workload
- Tight budget
- Go live date set - ambitious schedule up live in July
- Physically Dispersed
- Hard to break the old habits
- Is bond money going to be sufficient to cover all the costs to keep moving forward?

Opportunities

- Save money (Reduce maintenance contracts)
- Reduce "shadow" databases
- Improve Security of Data
- Better/easier access to students
- Better service to students
- Streamline Processes
- Data Integrity Improves
- Data Mining (Inst Research) - Better Decisions
- Disaster Recovery - build a more robust DR to stay up in event of earthquake
- Value added with new/enhanced functions
- Fewer tech components to support
- Better tech standards to make support easier
- Enables better reporting capabilities
- Facilitate use of common processes for both colleges
- Less moving parts
- Offer us good opportunity to think about our architectural plan
- Gives students consistent way to get to their information

- Calendars - counseling - good way for student to interact with college

Threats

- Not knowing what the shadow systems are
- What are all the batch processes
- Costs to modify 3rd Party Software that interfaces with the UDC - vendor might say since you're going to Banner, this might change the 3rd party system interface and cost additional money
- 3rd Party Software vendors who go out of business
- Change to how people do their jobs
- Inadequate fallback or backup when an integration function fails
- Not having a viable alternative process to execute critical functions during emergencies
- Continuity through multiple upgrades to system
- expectations that new system will be a miraculous solution to all current inadequacies
- Users may put off resolving current issues
- Maintaining 2 systems for next couple of years

3.3. Decisions Pending

During the on-site, the application portfolio matrix and gathered requirements were reviewed to identify those applications where a decision pending status was indicated. These applications are listed here to facilitate Foothill-De Anza in moving forward on decisions that impact the overall integration strategy and timeline.

Application	Notes
CheckGard, Evisions, Intellectcheck	
Card Solution	
BDMS or Hershey	No OCR with BDMS, not as good integration with Hershey
TouchNet - Payment Gateway / Portal Function	Portal function will go away - pretty sure not sure if payment gateway will stay as TouchNet or use something else
CashNet / or other cashiering solution	
CCApply or Banner Online application	
Oracle Portal	How to migrate channels/portlets to Luminis
MS-SQL Operational Data Store	Bigger question here is interim - what do we do when we stage our go-lives?
Curriculum Management	De Anza is using ECMS and Foothill is using 3CMS -- sounds like functionality isn't going to be replaced in Banner. These solutions manage the workflows and are digital. This feeds the college catalogs. Has an online interface - tags to do fonts. Probably will be needing and interface here
Advancement Self Service / Entango	Are they using this?

Scanner Software	Relative to time reporting - paper-based, bubble sheets -- goal is to get rid of it, but we'll see
Time Reporting	Liquid Office or Banner Time Entry - this is for exception-based reporting - like leave, jury duty, etc) Full time staff only
Voice Response - Stars (part of TouchNet)	ADA compliance - very small number use it - registration, make payments (This is called STARS) looking to get rid of
GoPrint	Do we want it or look at a different solution?
QuarterMaster	E-mail provisioning, nomenclature, etc.
Faculty/Staff Mail Client	Decided (not officially) no on Luminis, but want to keep sendmail for faculty/staff
Student E-mail	gmail - considering this (to be decided)
MeetingMaker	Do we want to deploy this for students? Do we want to deploy course studio as well?

3.4. Feasibility

SunGard Higher Education recommends that the Foothill-De Anza begin to look at integration from a strategic and institutional architectural design perspective. This approach will facilitate reuse and cost reduction to create and maintain the components necessary to facilitate integration. Foothill-De Anza's integration requirements are most significantly batch with a handful of integrations feeding from the IdM solution. Foothill-De Anza should focus their immediate attention on identifying a common platform for batch integration that leverages existing in-house technologies and skill sets; and solidify an IdM solution that can feed identity information to external third-party applications.

As it relates to the roll out of the Banner Unified Digital Campus, the main integration areas that will take the bulk of the work are:

- Replacement of existing integrations
- Time-sensitive management and coordination of interim interfaces between Banner, Luminis and legacy systems:
 - o Banner Finance and legacy HR Payroll & Budget, Student A/R (tuition and student refund checks) & Advancement interfaces.
 - o Legacy Advancement to Banner HR/Payroll for gifting via payroll deductions.
 - o Dual maintenance of student data between Banner Student and Legacy Student
 - o Luminis and migration of Oracle Portlets.
 - o Banner Student and legacy Advancement systems for student data synchronization.
 - o MS-SQL Operational Data Store, how will this be staged with the roll out of ODS/EDW?
- IdM implementation and its impact on integration and provisioning for the Banner UDC.

Following are pending decisions that impact integration planning:

- Decisions on retirement of software applications.
 - o Auction Pay
 - o Scanner software – scan time reports into HRS.

- Evaluation of Banner functionality for replacement of existing applications:
 - o TouchNet portal functionality
 - o Oracle portal functionality
 - o Liquid Office – time reporting
 - o Hershey Imaging software – OCR vs Integration, replaced by BDMS
 - o Voice Response – STARS (part of TouchNet) – ADA compliance
 - o Fund Driver
 - o Child Development Center
 - o Link
 - o Apprenticeship
 - o CCAApply – replaced by Banner online application
 - o Curriculum Management
 - o Advancement Self Service / Entango
- Third-party vendor selection and determination of integration effort:
 - o Online Payment gateway -- considering TouchNet
 - o Go Print -- don't really like this solution
 - o CheckGard or Evisions IntelleCheck
 - o Campus Card Solution
 - o CashNet or other cashiering solution
 - o QuarterMaster
 - o Faculty/Staff E-Mail Client
 - o Student E-mail
 - o MeetingMaker

In the short term, SunGard Higher Education is recommending that Foothill-De Anza:

- Take initial steps toward having an institutional integration architecture.
- Utilize existing integration technologies and standard interfaces.
- Train staff on integration technologies such as PL/SQL, XML, Pro*C, java, etc., to complete the various integrations. Become familiar with Banner Integration technologies such as Luminis Data Integration SDK and Banner Batch Integration Framework as well as Banner API programming. Utilize Banner Entity diagrams and Banner API documentation.
- Establish standards for integration development that follow best practices, reference existing resources such as “PL/SQL Best Practices” and “Implementing the IEEE Software Engineering Standards.” Utilize code reviews for quality control and training.
- Select a platform for Batch Integration and look for reusable data structures and business processes. The majority of the Foothill-De Anza’s integration Interfaces are batch. Banner batch integration framework is one solution for batch integration. MS SQL server’s Data Transformation Services (DTS) tool also provides utilities for export, transform and load processes as well as monitoring and file transfer. Many ETL solutions exist in the marketplace, an appropriate platform should be selected to support the institutions needs. Wherever possible leverage existing Banner APIs for the export/import of data.
- Leverage IdM solution for synchronization of identity information to external applications.
- Where possible leverage other tools and technologies that could reduce integration workload.

Longer term, Foothill-De Anza should:

- Continue to formalize the FHDA's integration strategy and architecture
 - o Ensure the integration architecture aligns with the institutional data architecture/domain model.
 - o Drive toward a common institutional canonical data model for the overall institution to adhere, including consistent Identity Management practices.
 - o Rationalize integration decisions.
 - o Embrace SOA and Enterprise Integration further:
 - Utilize Web Services
 - Utilize an Enterprise Service Bus
- Where possible leverage other SOA tools and technologies that could reduce integration workload and offer additional control and monitoring of batch file integration:
 - o Evaluate an ETL tool for interim integrations as Banner Components are brought to production or for bulk data exchange needed for a long term solution.
 - o The Enterprise Service Bus to manage the transformation and delivery of flat files
- Consolidate business processes between campuses to use a single application to gain operational and integration efficiencies.

3.5. Service-Oriented Institution Maturity ModelSM

SunGard Higher Education has developed the Service-Oriented Institution (SOI) Maturity Model that represents the technology steps to take to mature your service-oriented architecture, along with the SunGard Higher Education professional services and value obtained at each step of maturity. The 5 levels of the SOI Maturity Model are presented in the Appendix of this document.

Foothill-De Anza is at **Level 1: Aligned:**

Level 1 is the stage to begin the adoption of Service-Oriented Architecture starting with education and planning sessions. This Architecture and Planning Service is the planning component of Level 1 of the SOI model. Two implementation services – for the UDC Identity and UDC Web Services, are great first projects to introduce SOA concepts and technologies.

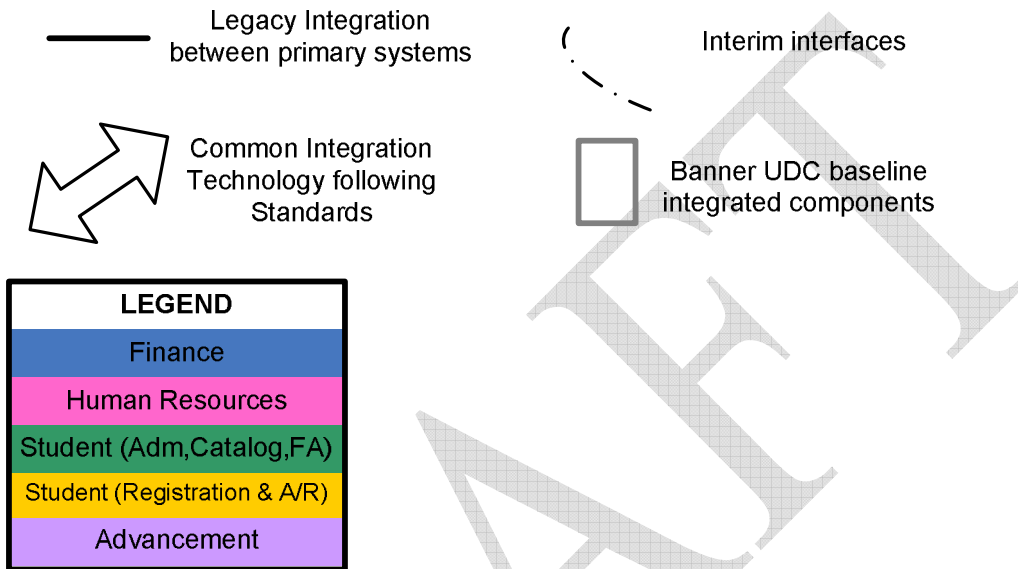
At the end of Level 1, an institution will be aligned on how to adopt SOA with education, a governance model, a road map to being a service-oriented institution and enabling two tangible SOA technology projects. Many schools at this level may not have an enterprise view of their integration requirements that need to now be translated into an SOA architecture and approach.

The sequence number refers to the Application Portfolio Matrix which contains additional notes and information (for cross referencing purposes). Below is the key for potential integration approaches. If more than one integration approach is listed then a combination and/or selection of integration approaches provide the solution.

Status	Description
Note	For Decision Pending and TBD, if an integration strategy can be determined with the information available a recommendation for the integration strategy was included.
Decision Pending	A decision on replacement software or retirement of the system is pending and impacts the need for integration.
Duplicate	The integration listed has been duplicated previously on the list.
Existing	The interface already exists.
NA	Not Applicable – client indicated the application integration was not applicable or there was no integration requirement.
No Integration	No integration is required.
Recommend	An approach for the integration has been recommended.
Replaced	The system has been replaced and no interface is required.
TBD	Foothill-De Anza is waiting to determine if Banner or other system will replace the functionality of the application and eliminate the need for an interface.
Integration Strategy	
Baseline	Banner provides the integration capability, and can be implemented with minimal effort.
Batch	The integration strategy is batch. Banner integration framework is one solution for batch integration. MS SQL server's Data Transformation Services (DTS) tool provides utilities for export, transforming and loading data as well as monitoring for errors. Many ETL solutions exist in the marketplace, an appropriate platform should be selected to provide the institutions needs. Batch programs should utilize existing Banner APIs where possible.
BDMS	Integration with the Banner Document Management Suite (BDMS, formerly xTender) can provide the required integration.
BSS	Self-Service Banner and/or Luminis Banner channels provide the functional or can be extended to provide the functionality
Channel	A Luminis channel can provide the functionality.
Custom	There is no existing integration approach available. A custom project will be necessary to achieve integration with these systems.
eLearning	Banner Integration for eLearning – A standard service that is included with the Foothill-De Anza UDC project
GCF	GCF framework for Luminis provides mechanism for SSO.
IdM	Current integration will be provided through the Identity Management processes under consideration. This may also include the leveraging of Identity information via the LDI messaging infrastructure as well.
ODS/EDW	ODS/EDW application provides the functionality
Report	The need for integration is replaced by a custom report or standard report.
SSO	Luminis Single Sign-On channel provides the functionality.
Standard	SunGard Higher Education or a collaborative member partner provides a standard service for integration between the 3rd party system and Banner
Workflow	Workflow processes can provide the functionality
WS	A combination of the baseline or extended Web Services can provide the integration capability for real-time processing.
*	Refer to Appendix 11.3 for additional information

The key to the diagrams in this section is color coded and indicates the separate Banner components in the UDC.

The lines representing data integration are as follows:



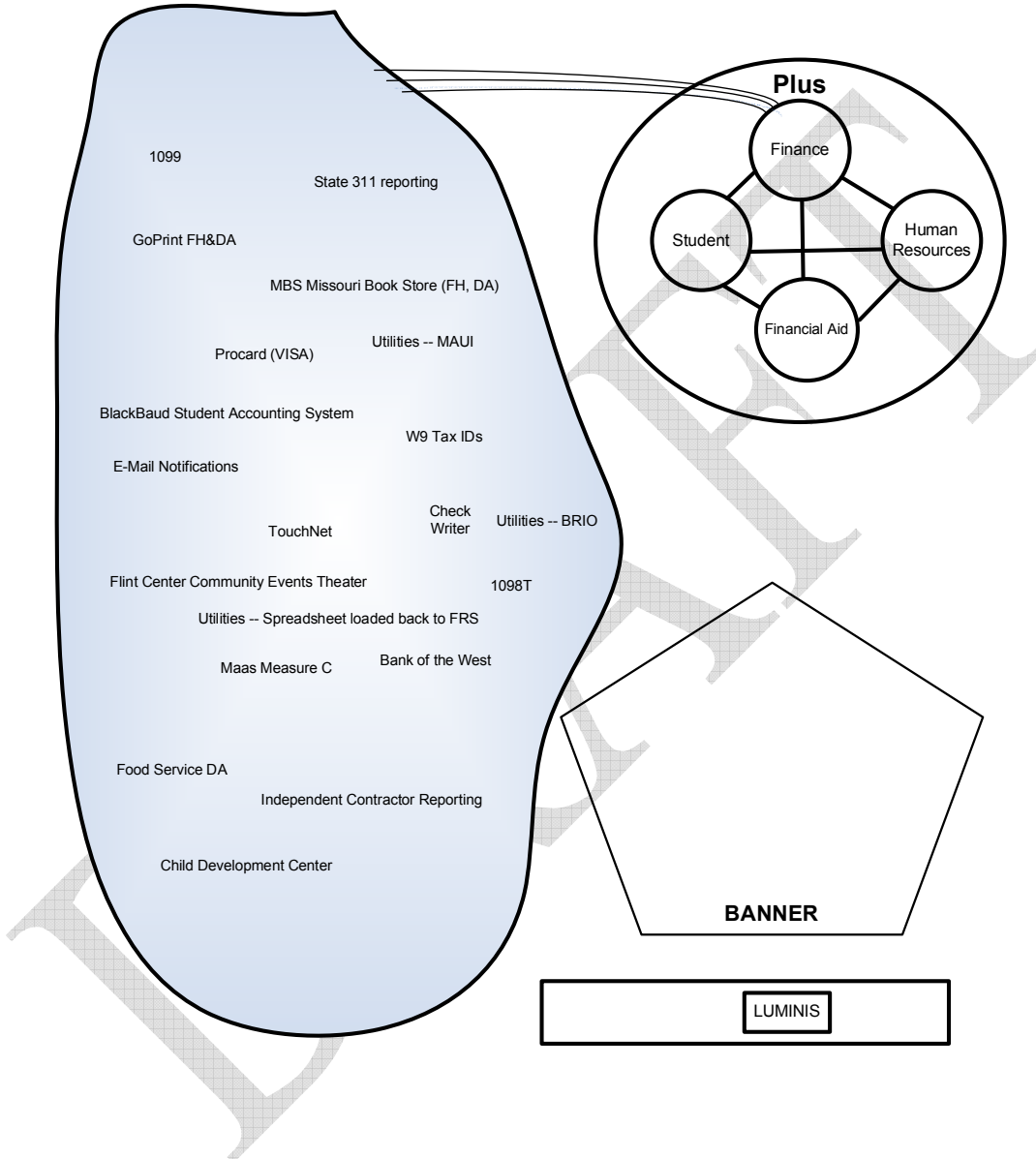
4.1. Portal and Communications

The following integrations are placed on the roadmap by the phase identified for Luminis channel deployment.

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
126*	Luminis Platform	Go-Live: July 2009	Recommend	Luminis	Baseline
127	WebMail -- handle passing credentials via a link	Go-Live: Finance, July 2009	Recommend		Channel
128	Oracle Portlets -- will be reworked in Luminis depending on what may or may not be replaced by existing functionality	Staged	Recommend		Channel
129	Moodle	Go-Live: Student Registration, April 2010 SSO adapter is included in the contract.	Recommend		SSO
130	eTudes (SAKAI)	Go-Live: Student Registration, April 2010	Recommend		SSO/GCF
131	Link through to Library, SSO or sign on once and then stores credentials	Go-Live: Student Registration, April 2010	Recommend		SSO/GCF
132	Link to National Clearinghouse via SSO link	Go-Live: Student Registration, April 2010	Recommend		SSO

4.2. Finance

The integration from the existing Finance system to other systems and applications is largely accomplished through batch interfaces.



Finance Interfaces

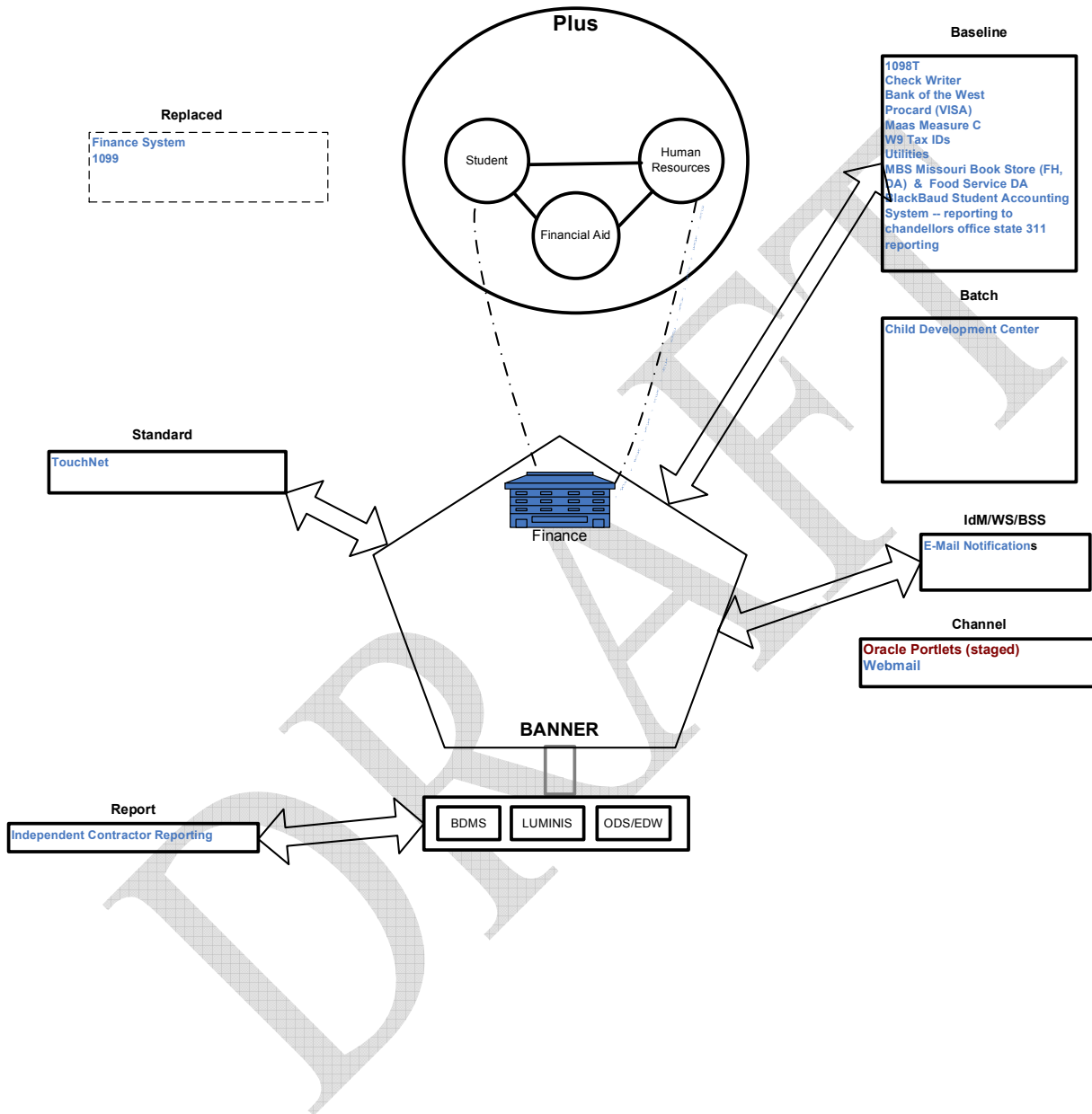
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
72	W9 Tax IDs		Recommend		Baseline
66*	1098T		Recommend		Baseline
67*	Check Writer	FABCHKP	Recommend		Baseline
68*	Bank of the West	FAABATC	Recommend		Baseline
69*	ProCard (VISA)		Recommend		Baseline
70*	Maas Measure C	GURFEED	Recommend		Baseline
75*	Utilities	GURFEED	Recommend		Baseline
78*	MBS Missouri Book Store (FH, DA) & Food Service DA	GURFEED	Recommend		Baseline
80*	BlackBaud Student Accounting System -- reporting to chancellors office state 311 reporting	GURFEED	Recommend		Baseline
81*	Child Development Center		TBD		Batch
76	E-Mail Notifications		Recommend		IdM
77	Independent Contractor Reporting		Recommend		Report
71	TouchNet		Recommend		Standard
64	Finance System		Replaced		
65	1099		Replaced		

Finance Interim Interfaces

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
83*	Legacy HR to Banner Finance	GURFEED	Recommend		Baseline
52*	Legacy Advancement to Banner Finance	GURFEED	Recommend		Baseline
104*	Legacy HR with SIS Plus (Budget)	FUPLOAD	Recommend		Baseline
No Sequence # *	Legacy Student AR to Banner Finance	GURFEED	Recommend		Baseline
No Sequence # *	Banner Finance to Legacy Student (Student Refund Checks)	GURFEED	Recommend		Baseline

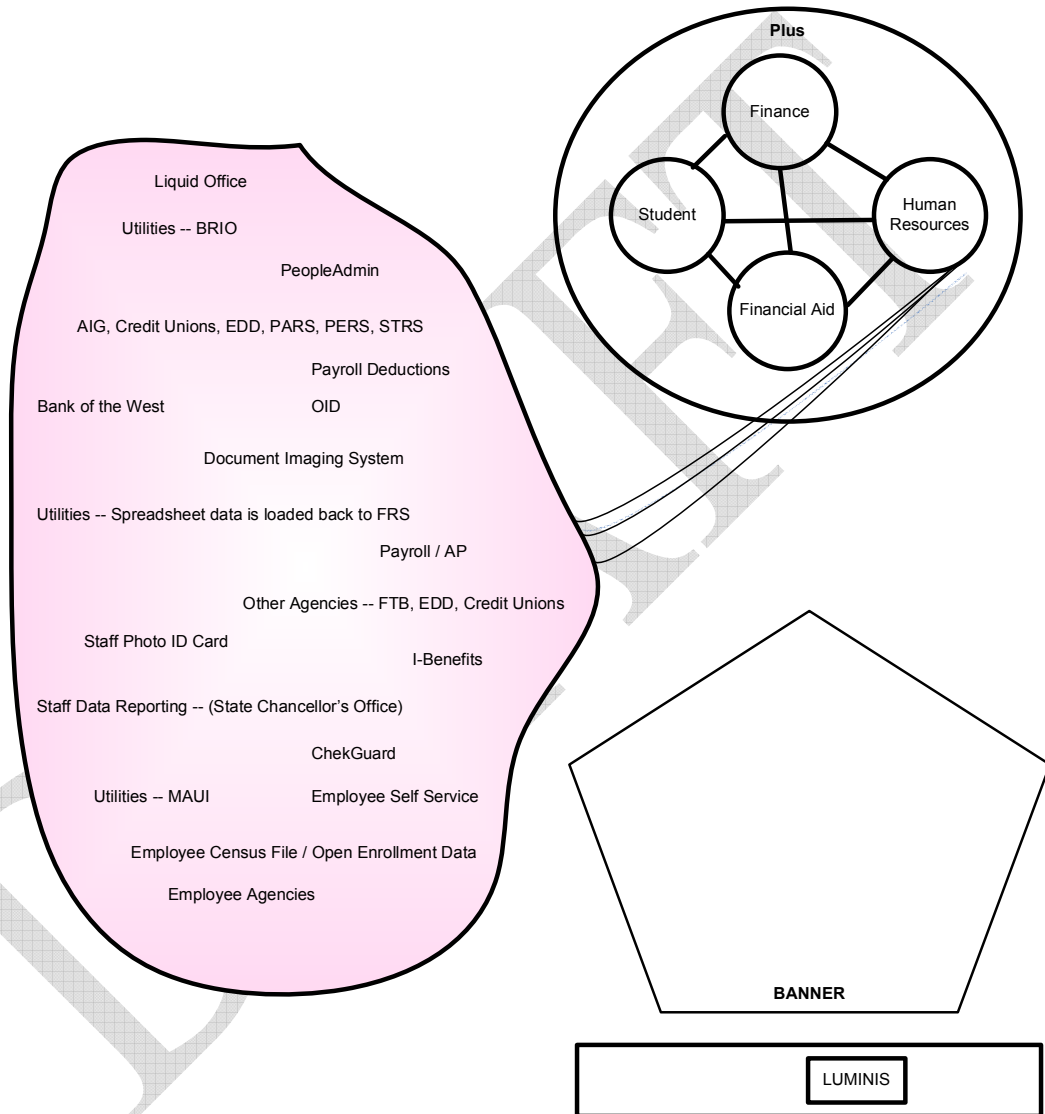
DRAFT

At the time of Banner Finance go-live, the Integration Roadmap will appear as shown below:



4.3. Human Resources

The integration from the existing the Human Resources system to other systems and applications is largely accomplished through batch interfaces.



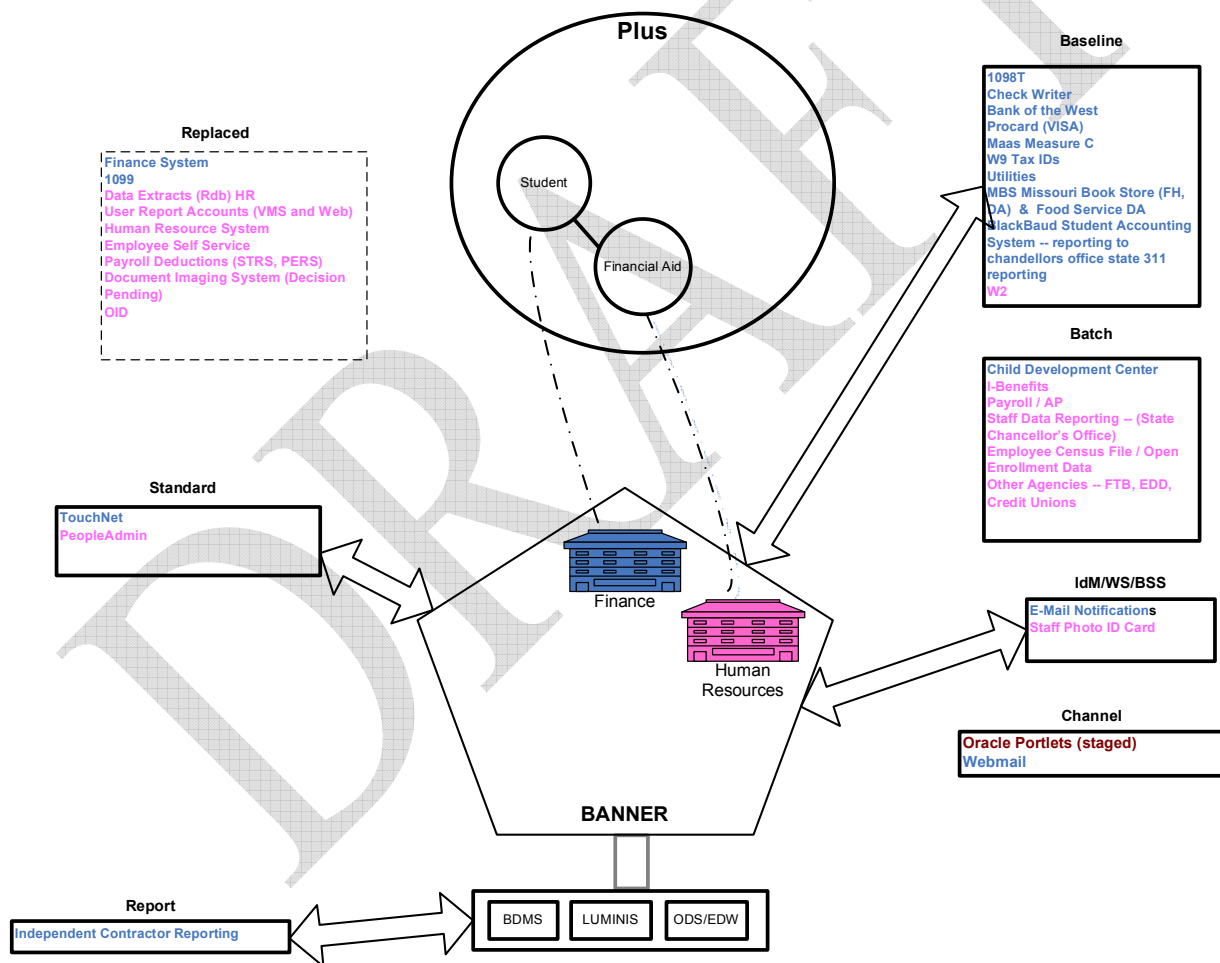
Human Resources Interfaces

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
94	W2		Recommend	Banner HR	Baseline
96	I-Benefits		Recommend		Batch
99	Payroll / AP		Recommend		Batch
105	Staff Data Reporting -- (State Chancellor's Office)		Recommend		Batch
106	Employee Census File / Open Enrollment Data		Recommend		Batch
107	Other Agencies -- FTB, EDD, Credit Unions		Recommend		Batch
102	Staff Photo ID Card		Decision Pending		IdM
101	PeopleAdmin		Recommend		Standard
103	Document Imaging System		Decision Pending		
55	Data Extracts (Rdb) HR		Replaced		
60	User Report Accounts (VMS and Web)		Replaced	Banner HR	
93	Human Resource System		Replaced	Banner HR	
98	Employee Self Service		Replaced	Banner HR	
100	Payroll Deductions (STRS, PERS)		Replaced	Banner HR	
112	OID		Replaced		

Human Resources Interim Interfaces

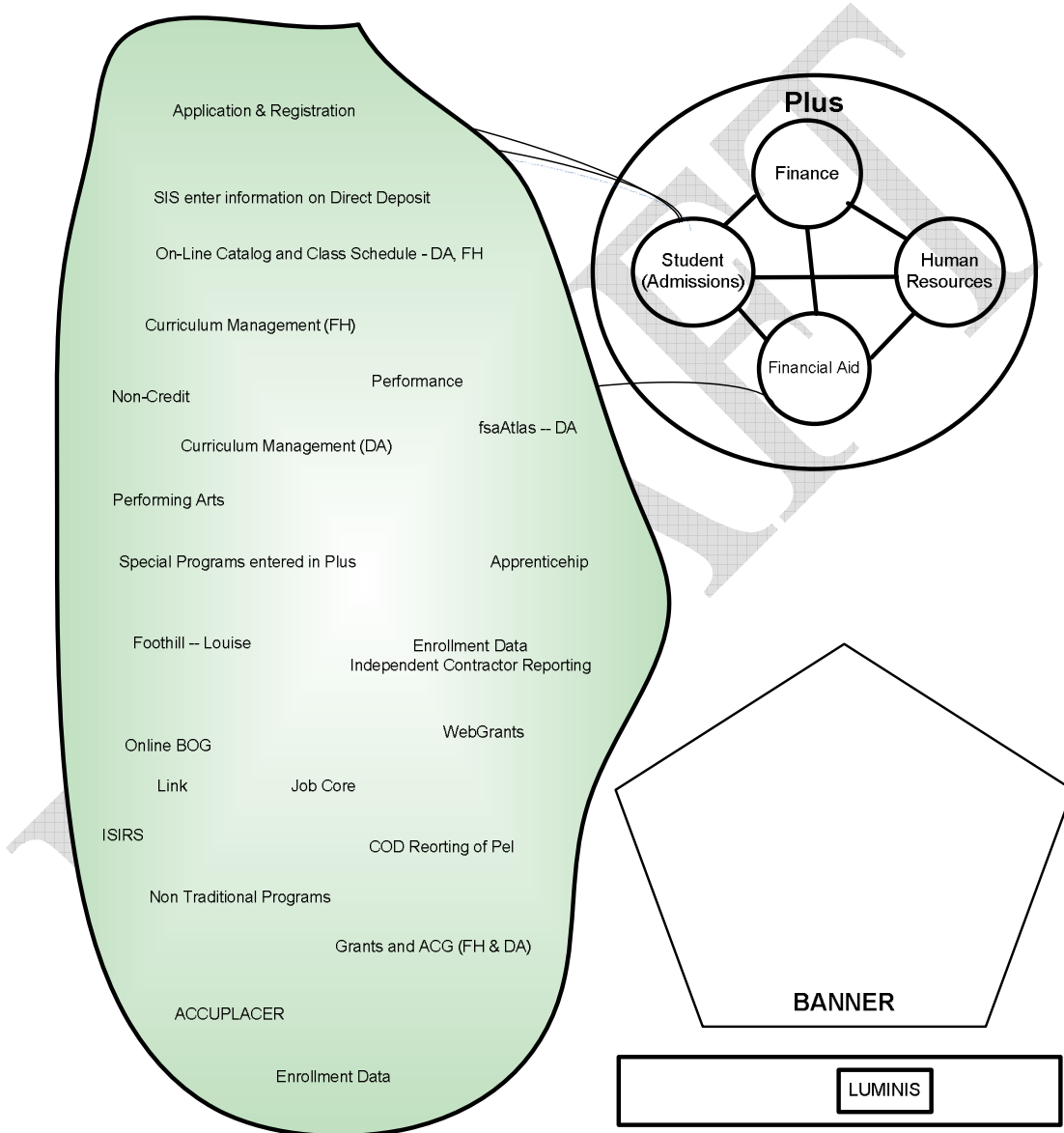
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
53	Legacy Advancement to Banner HR/Payroll		Recommend		Batch

At the time of Banner Human Resources go-live, the Integration Roadmap will appear as shown below:



4.4. Student Admissions, Student Catalog & Schedule & Financial Aid

The integration from the existing Student Admissions and Student Catalog and Schedule systems to other systems and applications is largely accomplished through batch interfaces.



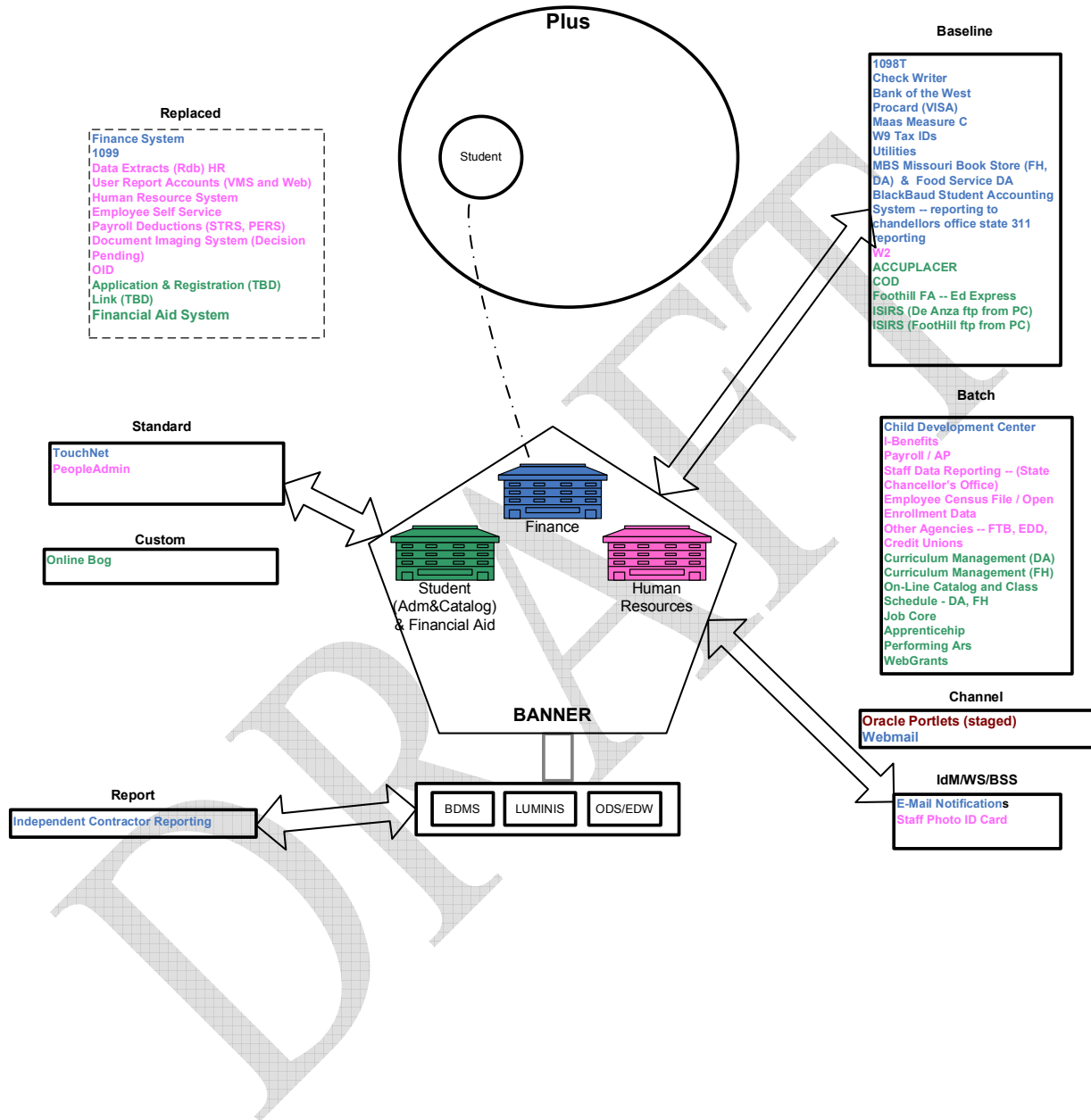
Student Admissions & Student Catalog Interfaces

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
117	ACCUPLACER		Recommend		Baseline
22	Curriculum Management (DA)		Recommend		Batch
23	Curriculum Management (FH)		Recommend		Batch
45	On-Line Catalog and Class Schedule - DA, FH		Recommend		Batch
116	Job Core		Recommend		Batch
119	Apprenticeship		TBD		Batch
121	Performing Arts		Recommend		Batch
114	Application & Registration		TBD		
120	Link		TBD	Flexible Registration	

Financial Aid Interfaces

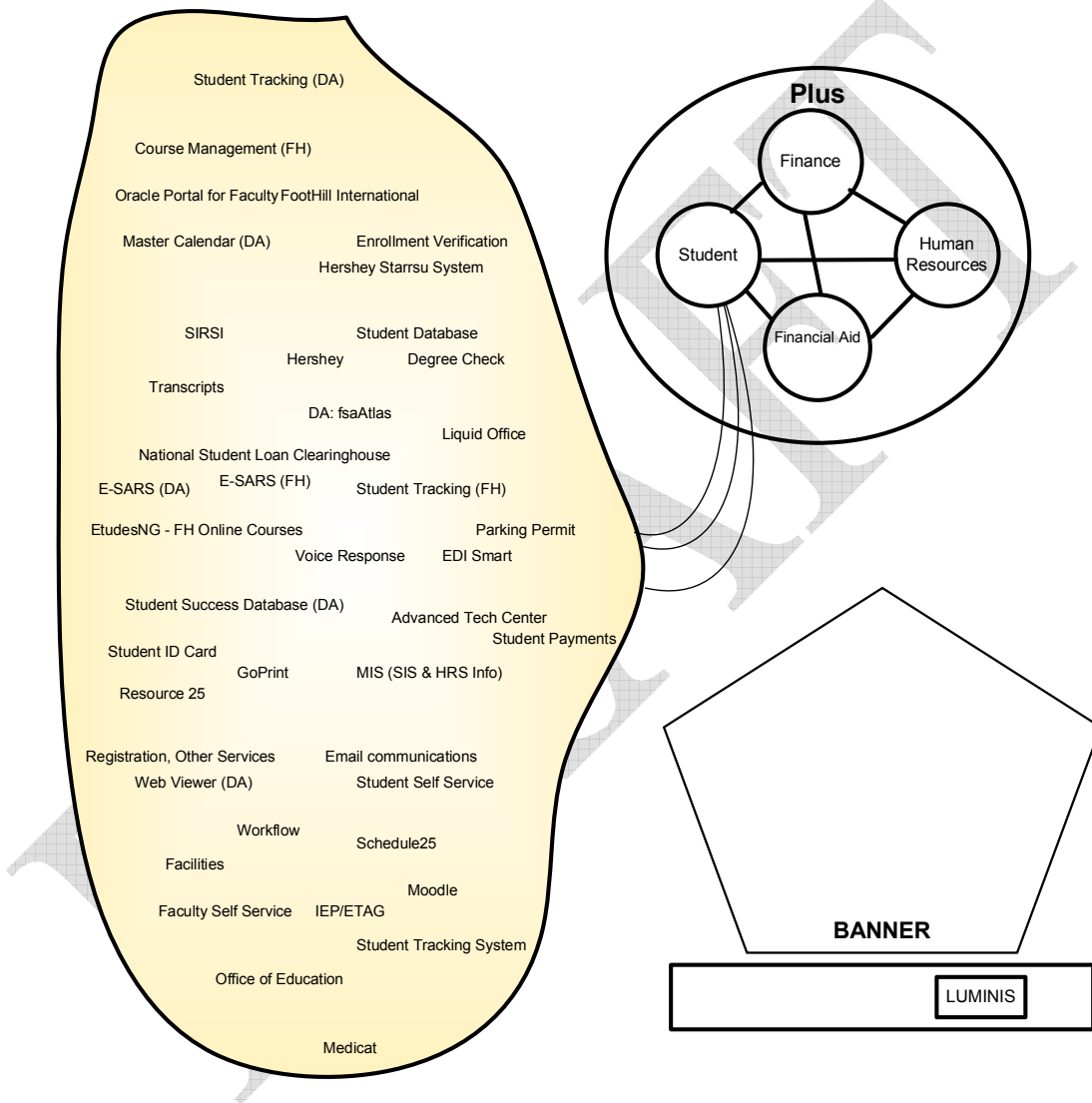
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
85	COD		Recommend		Baseline
86	Foothill FA -- Ed Express		Recommend		Baseline
87	ISIRS (De Anza ftp from PC)		Recommend		Baseline
88	ISIRS (FootHill ftp from PC)		Recommend		Baseline
90	WebGrants		Recommend		Batch
89	Online BOG		Recommend		Custom Script to make the assignment in Banner
84	Financial Aid System		Replaced	Banner Financial Aid	

At the time of Banner Student Admissions, Student Catalog and Schedule and Financial Aid go-live, the Integration Roadmap will appear as shown below:



4.5. Student (Registration & Student A/R)

The integration from the existing Student (Registration & Student A/R) system to other systems and applications is largely accomplished through batch integration.



Student Interfaces

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
9*	Degree Check		Recommend		Baseline
11*	Enrollment Verification		Recommend		Baseline
29	FootHill International Student Database - fsaAtlas		Recommend		Baseline
30	DA: fsaAtlas		Recommend		Baseline
37*	EDI Smart		Recommend		Baseline
15	Workflow		Recommend	Workflow	Baseline
41*	Email communications		Replaced		Baseline
31	GoPrint		Decision Pending		Batch
20	Liquid Office		Decision Pending		Batch
61	Scanner Software		Decision Pending		Batch
6	Medicat		Recommend		Batch
8	Student ID Card		Recommend		Batch
25	Student Tracking System		Recommend		Batch
28	Student Tracking System		Recommend		Batch
39	MIS (SIS & HRS Info)		Recommend		Batch
40	Student Success Database (DA)		Recommend		Batch
42	Hershey Starrsu System		Recommend		Batch
44	Office of Education		Recommend		Batch
57	Data Warehouse (Hyperion)	Depending on the timeline for implementation of ODS/EDW, there may be a requirement for staged interim interfaces between the new Banner systems and the Data Warehouse to maintain continuity of reporting	Recommend		Batch
22	Curriculum Management (DA)		Recommend		Batch

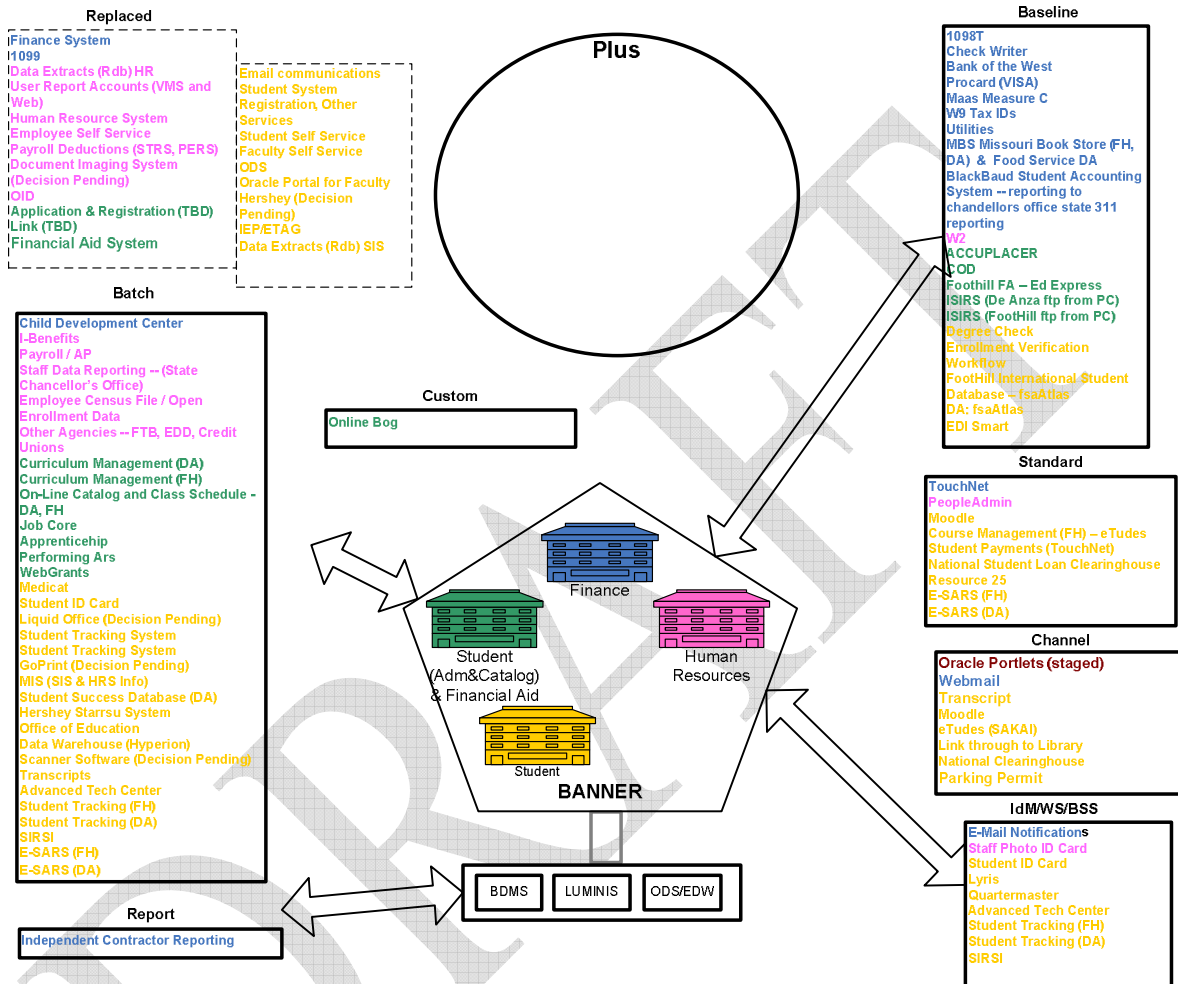
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
23	Curriculum Management (FH)		Recommend		Batch
45	On-Line Catalog and Class Schedule - DA, FH		Recommend		Batch
36	Transcripts	To synchronize the data, utilize batch, also a candidate for SSO channel in Luminis	Recommend		Batch/Channel
10	Parking Permit	Luminis will be replacing the TouchNet portal. This connection to Credentials for Parking Permit ordering can be channelized in the Luminis portal.	Recommend		Channel
12	Moodle	Data Integration	Recommend		eLearning
24	Course Management (FH) - eTudes		Recommend		eLearning
38	EtudesNG - FH Online Courses		Recommend		eLearning
59	Quartermaster		Decision Pending		IdM
7	Student ID Card		Recommend		IdM
58	Lyris		Recommend		IdM
21	Advanced Tech Center	For populating the student data to the system, IdM solution should be considered. For reporting to the State, batch export.	Recommend		IdM/Batch
26	Student Tracking (FH)		Recommend		IdM/Batch
27	Student Tracking (DA)		Recommend		IdM/Batch
35	SIRSI		Recommend		IdM/Batch
2	Student Payments	As long as TouchNet is chosen, standard, otherwise may be custom depending on other third-party vendor selected.	Decision Pending	Banner Student	Standard
34	National Student Loan Clearinghouse		Recommend		Standard
43	Resource 25, Schedule25; Web Viewer (DA); Master Calendar (DA); and Facilities		Recommend		Standard

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
4	E-SARS (FH)	A standard solution for outbound data is currently being developed with SARS (development to begin Q1 - 2009), inbound data will require a batch integration.	Recommend		Standard/Batch
5	E-SARS (DA)	A standard solution for outbound data is currently being developed with SARS (development to begin Q1 - 2009), inbound data will require a batch integration.	Recommend		Standard/Batch
16	BDMS (Xtender)		Decision Pending	BDMS	
19	Voice Response		Decision Pending		
32	Hershey		Decision Pending	BDMS	
1	Student System		Replaced	Banner Student	
3	Registration, Other Services	Replaced by Banner Student Self-Service	Replaced	Banner Student	
13	Student Self Service		Replaced	SSB	
14	Faculty Self Service		Replaced	SSB	
17	ODS - Operational Data Store		Replaced	ODS/EDW	
18	Oracle Portal for Faculty		Replaced	Luminis	
33	IEP/ETAG		Replaced	DegreeWorks	
56	Data Extracts (Rdb) SIS		Replaced		

Student Interim Interfaces

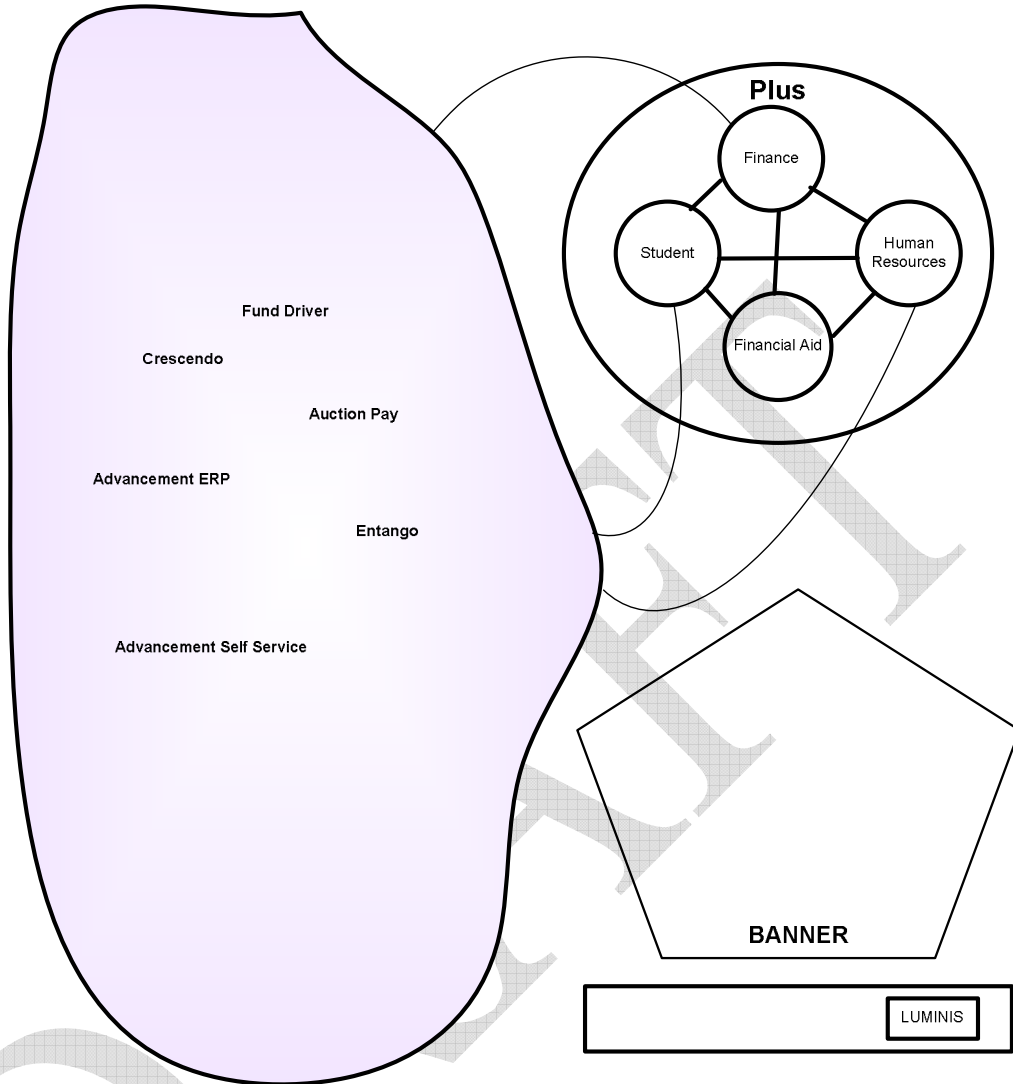
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
54	Banner Student to Legacy Advancement		Recommend		Batch

At the time of Banner Student (Registration & Student A/R) go-live, the Integration Roadmap will appear as shown below:



4.6. Advancement & Degree Works

The integration from the existing Advancement systems to other systems and applications is largely accomplished through batch integration.



Advancement Interfaces

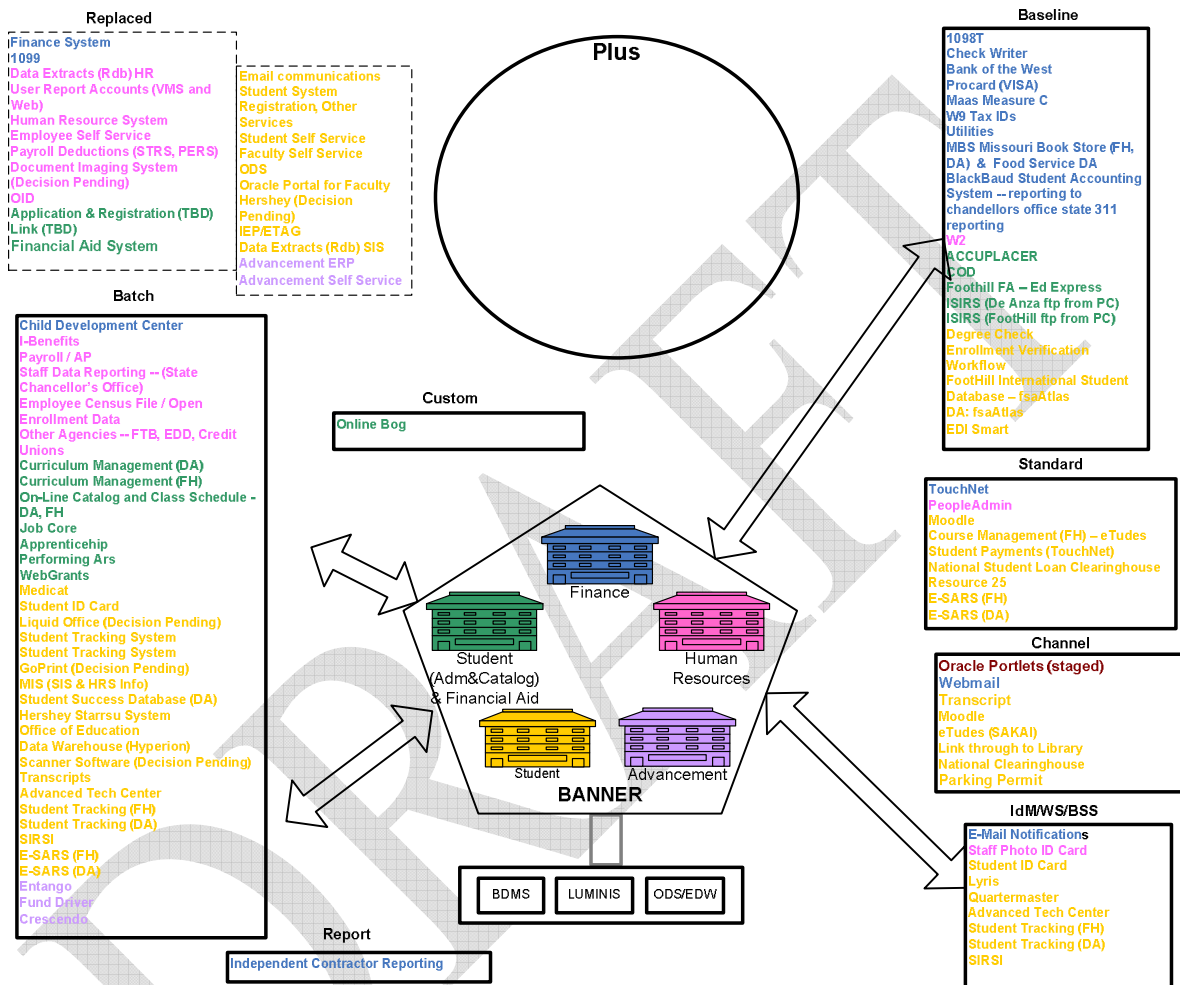
ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
48	Entango		Recommend		Batch
49	Fund Driver		TBD		Batch
50	Crescendo		Recommend		Batch
46	Advancement ERP		Replaced	Banner Advancement	
47	Advancement Self Service		Replaced	Alumni Self Service	
51	Auction Pay		Decision Pending		
115	Degree Works		Recommend		Baseline

Degree Works Interface

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
115	Degree Works		Recommend		Baseline

UDC Final Integration Landscape

At the time of Advancement & Degree Works go-live, the Integration Roadmap will appear as shown below:



4.7. No Integration Requirement or Duplicate

The following interfaces were identified as duplicates or requiring no integration.

ID	Name	Comments	Status	Future UDC	UDC Solution - Integration Strategy
82	GoPrint FH&DA		Duplicate		
91	Enrollment Data		Duplicate		
92	Independent Contractor Reporting		Duplicate		
95	Bank of the West		Duplicate		
97	Liquid Office		Duplicate		
108	ChekGuard		Duplicate		
109	Utilities		Duplicate		
110	Utilities		Duplicate		
111	Utilities		Duplicate		
113	Employee Agencies		Duplicate		
118	Foothill -- Louise		Duplicate		
133	Resource25		Duplicate		
135	SQL 2005 - SIS		Duplicate		
136	SQL 2005 - HRS		Duplicate		
137	SQL 2005 - FRS		Duplicate		
73	Utilities		Existing		
79	Flint Center Community Events Theater		NA		
122	Non Traditional Programs		NA		
123	Performance		NA		
124	Non-Credit		NA		
125	Special Programs entered in Plus		NA		
74	Utilities		Retired		

5. Applicable SunGard Higher Education Professional Services

The following services relative to integration are currently scheduled for the Foothill-De Anza from the SunGard Higher Education Professional Services Team.

5.1. Banner Integration for eLearning

The purpose of this service is to provide the installation, training and consulting services to support one instance of Banner Integration for eLearning with one eLearning Management system. The service is delivered in 4 phases with a combination of on site visits, remote connectivity and conference calls. Attendees will gain experience from functional and technical training for client resources, and each phase has set of pre-requisites and deliverables. Consultation and deliverables will include documentation, hands-on Banner setup, execution and testing of batch ICGORLDI integration for batch synch and real-time event-messaging processes.

Moodle has created an adapter to work with our baseline Integration Technologies for passing information from Banner to Moodle. This adapter is available open source. In addition to the standard eLearning for Integration service, Foothill-De Anza has the following included in their contract:

SSO for Moodle
Content Router Service for Multiple LMS
Moodle & Sakai Integration Consulting.

SunGard Higher Education Contact
Lori Mauthe
Practice Manager, Systems Integration
Lori.Mauthe@sungardhe.com

5.2. Windstar International Tax Navigator

Interface Features (available for Banner 7.x, 8.x)

- Export employee records from Banner HR to Windstar International Tax Navigator to create base individual records
- Export year-to-date earnings from Banner HR to Windstar International Tax Navigator for tax treaty and substantial presence testing
- Import results of tests from Windstar International Tax Navigator to Banner HR
 - o Creates and Updates deductions for employees
 - o Creates and Updates values for Citizenship and Recipient

- Perform 1042-S reporting in either system

Note: The Windstar interface implementation is included in the SunGard Higher Education services purchased by Foothill-De Anza.

Contact Information

SunGard Higher Education Contact
Kirsten Anderson
Sales Consultant
kirsten.anderson@sungardhe.com

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6. Available SunGard Higher Education Professional Services

The following services relative to integration are available from the SunGard Higher Education Professional Services Team.

6.1. Banner Modification for Third Party Charge Load

The third-party charge load provides the ability to load a fixed-length file consisting of charges from different external sources into Banner® Account Receivables. The file format for all of the external sources may vary. Thus, a single process is required that will allow the University to post the charges into Banner. A new process will be created that takes a flat file of third party transactions and loads them into the Banner® A/R transaction table (TBRACCD). The solution includes a form that allows the set-up of the file format and a c program that processes the load. The standard service is 130 hours, Statement of Work available upon request.

SunGard Higher Education Contact
Jackie McNabb
Team Manager, Customization Services
jackie.mcnabb@sungardhe.com

6.2. Custom Integration Assessment Service

SunGard Higher Education provides an Custom Integration Assessment Service. The purpose of the service is to create a detailed statement of work for a new integration solution. This is required to scope integration to a SunGard Higher Education component that has not been done before. The deliverable is an estimate as to the level of effort and technology needed, as well as project assumptions for the proposed integration. A Statement of Work is available upon request.

SunGard Higher Education Contact
Lori Mauthe
Practice Manager, Systems Integration
Lori.Mauthe@sungardhe.com

Third-Party Systems Identified:
Oracle Portlet Migration
Credentials, Inc
FitnessTrac
CheckGard
Mass Measure C
ProCard

6.3. Custom Integration Implementation

In the case that the Foothill-De Anza does not have the bandwidth to implement all integration needs for go-live, SunGard Higher Education can provide services to co-design, develop and implement the Foothill-De Anza's integration needs.

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7. Integration with 3rd Party Vendors

7.1. National Student Clearinghouse (NSC)

SunGard Higher Education built and maintains batch data transfer interfaces to NSC's core offering and DegreeVerify. This integration is part of Banner baseline. In addition a SSO connector between Luminis and NSC or Banner Self-Service and NSC is available for a fee.

Partner Contact:

Frost Johnson, Director

johnson@studentclearinghouse.org, 503.892.8760

www.studentclearinghouse.org

SunGard Higher Education Contact:

Cristina Martin

cristina.martin@sungardhe.com

SSO connectors

SunGard Higher Education Contact

Lori Mauthe

Practice Manager, Systems Integration

Lori.Mauthe@sungardhe.com

7.2. PeopleAdmin Applicant Tracking

SunGard Higher Education Professional Services provides a batch interface between PeopleAdmin Applicant Tracking and Banner HR, A Statement of Work is available upon request.

Description

The SunGard Higher Education modification provides a batch process that will use as input a file of "new hires" from the PeopleAdmin Applicant Tracking software system and load the data from the file into the Banner Human Resources software system. This batch process will use the Banner Baseline Common Matching functionality to attempt to find a person match in the Banner Human Resources software system for each record from the PeopleAdmin Applicant Tracking software system and create an Electronic Personnel Action Form ("EPAF") transaction to create and/or update general person, employee, and job assignment information in the Banner Human Resources software system.

Partner Contact:

Brandon Phipps, VP Sales and Business Development

brandon.phipps@peopleadmin.com
www.peopleadmin.com

SunGard Higher Education Contact
Carrie L. Silliman
Carrie.Silliman@sungardhe.com

7.3. *TouchNet*

SunGard Higher Education collaborated with TouchNet to provide Banner and Plus customers with various integrated commerce solutions. Credit card payment processing integration is part of Banner A/R baseline. TouchNet also built, provides and maintains Banner database table integration between its products and various Banner modules.

Partner Contact:
John Murphy, Vice President
www.touchnet.com

SunGard Higher
Education Contact:
Cristina Martin, cristina.martin@sungardhe.com,

7.4. *Evisions, Form Fusion, IntelleCheck*

Form Fusion: Form Fusion easily transforms plain, unformatted SunGard Higher Education Banner® baseline output into impressive digital documents. Insert your logos, signatures, and graphics, then add new data using SQL. You can begin with the templates for many of the most common processes; or build your own. When the document is complete print automatically distribute it through e-mail, or send it to archive. Use SunGard Higher Education Banner® like always, Form Fusion works invisibly in the background.

Intellecheck: A laser check solution designed to integrate with SunGard Higher Education Banner®. The process is tailored to meet institutional printing, routing, security, and data needs. Run the Banner processes (PHPCHKL or FABCHKP), and the system will generate laser checks on blank check stock. The checks will be complete with MICR coding, secure signatures, your logos and formatting, and custom information on the stub. File copies and direct deposit advice can print on plain paper from any bin.

Partner Contact:
Tory Sullivan, VP Business Development
tsullivan@evisions.com
www.evisions.com

7.5. *CollegeNET Resource 25*

CollegeNET provides full data integration with the Banner Student Information System for seamless academic scheduling. The integration pushes and pulls academic event and special event data from the Banner Student Information System to R25. Space and Event scheduling is optimized and managed in R25. The space assignments are then sent to Banner to synch both systems. The interface operates in two primary modes: bulk and transactional. The former is done before the beginning of a term or semester (usually moving hundreds of events) while the latter is done on a day-to-day basis to keep events in synch after the term/semester begins.

The interface facilitates: a) bulk loading of class data from the SIS to R25 as you prepare for room scheduling, and b) transactional loading into R25 of class additions, changes, and cancellations as they occur during each term. The interface utilizes database triggers to update Banner. The interface configuration screen is a user-friendly HTML based web form, fully integrated with R25.

The Interface converts your Banner SIS course schedule information to vCalendar files that can be imported into R25. vCalendar is a scheduling data exchange file format; vCalendar files are ASCII files with a specified format consisting of standard and vendor specific properties and their values.

R25 - Banner AR interface

The R25®-Banner AR (Accounts Receivable) Interface allows R25 event pricing information to be automatically posted to Banner AR for invoicing purposes. Banner AR is a module of the Banner Finance and Banner Student systems.

Emil Izunagbara
Associate Vice President
Business Development
CollegeNET, Inc.
e-mail: emilizu@collegenet.com
<http://corp.collegenet.com>

8. Acknowledgement of Recommendation and Completion

By signing the below, the Foothill-De Anza confirms receipt, review and completion of the Integration Architecture and Planning findings and recommendation for the Banner Student and Financial Aid implementation at the Foothill-De Anza.

From this point forward the Foothill-De Anza is responsible to determine how to use or not use the recommendations provided and making any additions or modifications to the provided tools.

Name
Title Executive Sponsor
Date

Name
Title Project Manager
Date

DRAFT

9. Document History

Revision Record

Number	Date and Sections	Author	Notes
v1.0	December 3, 2008	Susan Johnson, Brad Vacura	Initial

10. Acronyms

Acronym	Description
API	Application Programming Interface
EAI	Enterprise Application Integration
ESB	Enterprise Service Bus
ETL	Extract Translate Load
IMS	Instruction Management Systems
JMS	Java Messaging Service
LDIS	Luminis Data Integration Suite
LDIS-P	Luminis Data Integration Suite Protocol
LMB	Luminis Message Broker
LMG	Learning Management Gateway
MOM	Message-Oriented Middleware
PESC	Post Secondary Electronic Standards Council
SOA	Service-Oriented Architecture
SOAP	Simple Object Access Protocol
SOI	Service-Oriented Institution
UDDI	Universal Description, Discovery and Integration
WSDL	Web Services Description Language
XML	eXtensible Markup Language

11. Appendices

During the course of the SunGard Higher Education Integration Assessment a number of artifacts were developed. These are described in the following appendix and are available for the Foothill-De Anza to use and continue to develop and maintain as the Foothill-De Anza's integration landscape evolves.

This includes:

- Integration Application Portfolio Matrix
- Service-Oriented Institution Maturity ModelSM
- Integration Technologies Whitepaper

11.1. Application Portfolio Matrix

The Application Matrix documents the applications in use at the Foothill-De Anza and helps to detail the integration touch points and needs that drive the particular interfaces and integrations needed. This Application Matrix should be used to help design the enterprise integration architecture, identify the sources of information, and the potential for re-use of interfaces and integration needs.

The Application Portfolio Matrix workbook consists of the following worksheets:

Internal and External Application Services

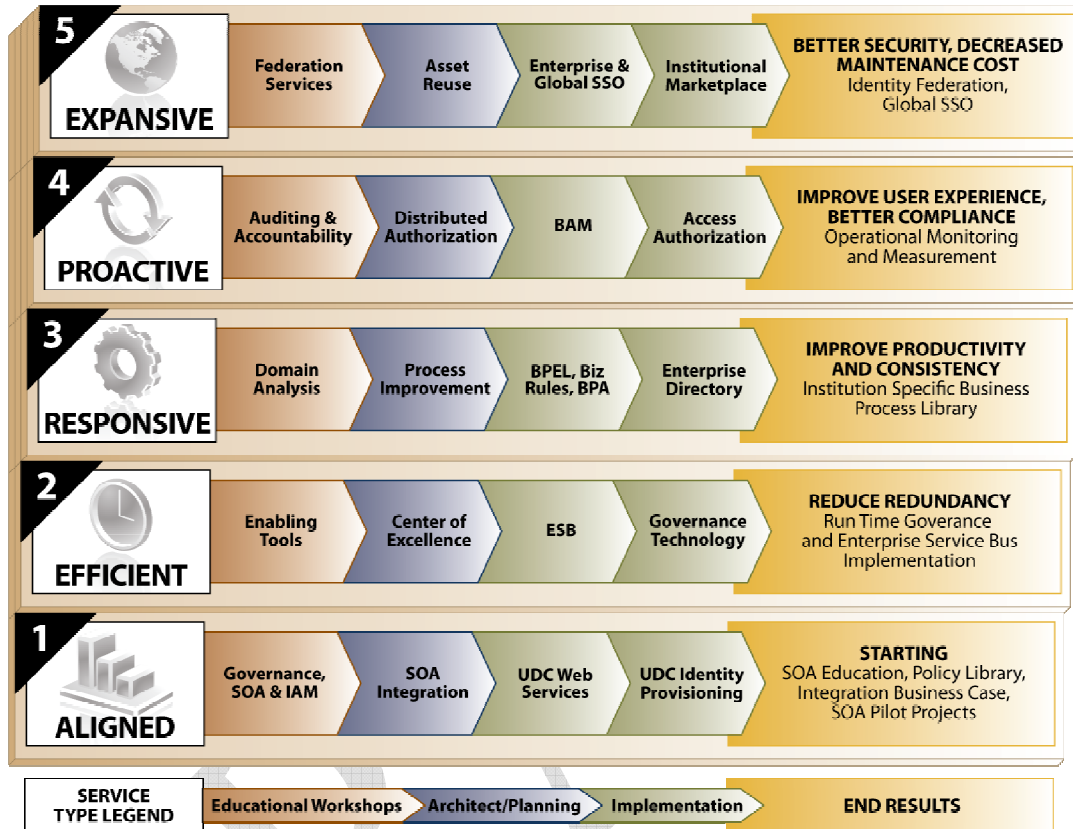
Listing of internal and external applications or services provided by 3rd parties that the institution uses and may need to exchange/share information and notes taken during on-site visit.

Integration Interfaces

This workbook contains the current interfaces and other interfaces identified for integration during the implementation of Banner.

11.2. Service-Oriented Institution Maturity ModelSM

The Service-Oriented Institution Maturity Model from SunGard Higher Education is defined as follows:



As we look at what we believe must be taken on and implemented for success – we realized that there are many impacts and options. What naturally emerged from our studies was this maturity model – which we refer to as the SunGard Higher Education Service-Oriented Institution Maturity Model.

As we discussed and analyze our clients current environments we found that the truth is all of us are at level 1 – by understanding what we are up against we can acknowledge that this may be easily a 3-5 year plan for many schools.

Key Points

- Technology adoption steps to mature the institution's SOA
- SunGard Higher Education Professional Services to assist with the education, planning and implementation of these technology steps
- The value received/obtained at each level of mature
- Predict the Value for you over time

SunGard Higher Education has developed the Service-Oriented Institution Maturity Model that represents the technology steps to take to mature your service-oriented architecture, along with the SunGard Higher Education professional services and value obtained at each step of maturity. The 5 levels of the SOI Maturity Model are:

Level 1: Aligned

At the end of this step an institution will be aligned on how to adopt SOA with education, a governance model, a road map to being a service-oriented institution and enabling two tangible SOA technology projects. Many schools at this level may not have an enterprise view of their integration requirements that need to now be translated into an SOA architecture and approach.

Level 2: Efficient

Now that you understand SOA you can architect a next-step, cost-effective solution for integration. Here an Enterprise Service Bus is utilized to help decouple system integration needs. An SOA center of excellence is established for efficiency and archiving services for re-use, which combines an integration competency center with governance. Through the SOA COE a structured methodology is in place with best practices and standards for integration. Further tools are utilized for the SOA COE such as a run-time governance Tool. Note that business processes are still inefficient at this stage, especially since cross-departmental business rules are embedded within applications rather than available for reuse across applications and functions within the institution.

Level 3: Responsive

At this level schools learn how to break down cross-department business problems to solve using SOA. Business process modeling occurs across the institution, and technologies in use to help integrate the campus include rules engines and BPEL technology. Strategic planning is more formalized and a Business Process Tool is implemented.

Level 4: Proactive

Schools at this level of maturity have evolved from Identity Management to a Distributed Authorization Plan. Auditing and accountability practices are focused on ensuring SOA standards are followed that can be measured and that new applications are built to integrate with the UDC.

Level 5: Expansive

Institutions arrive at seamless “plug and play” integration with limitless extensibility in level five, the ultimate level of SO Institution maturity. In use is business process management (BPM) technology and a large repository of reusable business-level services to integrate and extend the campus. Enterprise and Global Single Sign-on and Identity in conjunction with Federation and Institutional Marketplace provide revenue generation opportunities.

Institutional benefits:

Reduced costs: Most SOA benefits are the soft kind, which are hard to measure, but a number of organizations have been able to demonstrate significant cost savings through reuse. In an oft-quoted case study, Merrill Lynch claims to have saved as much as \$42 million since 2001. Another Fortune 50 financial conglomerate anticipates saving hundreds of millions of dollars per year by refactoring complex yet generic infrastructure functionality, such as auditing, security, and management, into shared services.

- **Reduced redundancy:** One of the primary goals of SOA is to implement functionality once and reuse it in all applications that need it. A SOA initiative can help an organization identify redundant functionality and decommission duplicate applications.
- **Better consistency, security, and compliance:** If a business rule is implemented in a service, then all applications that use the service will apply the business rule in a consistent manner. This benefit can be especially useful when implementing highly consequential rules, such as those related to security and legal regulations.
- **Improved productivity, efficiency, effectiveness, and satisfaction:** SOA enables access to whatever data or functionality an application requires; therefore, service-oriented applications should support business processes more effectively, and likewise, service-oriented applications should improve the user experience. For internal applications, a better user experience will make employees more productive and efficient. For external applications, a better user experience will improve customer satisfaction.

11.3. Notes

Sequence #	Integration	Additional Comments
126	Luminis Platform	<p>Person Data Integration between Banner Student and Luminis is be handled with the Luminis Data Integration components installed and configured during the Data Integration consultation.</p> <p>Person Data integration between the legacy plus system and Luminis is handled via Batch processing (ABKLDI (STUDENT), EBKLDI(HR), LBKLDI (Alumni))</p> <p>However this requires careful planning. The sourcedid.source and sourcedid.ids that Plus generates do not match Banner, and those values do not get migrated from Plus to Banner. If data is loaded from Plus into Luminis, Luminis data will need to be converted when the final switch is made from loading from Plus to loading from Banner.</p> <p>Either Plus or Banner is the authoritative source of data loaded to Luminis – when the authoritative source is switched, data will need to be converted. It is recommended that FHDA consult with a Luminis consultant familiar with the process of migrating from a Plus system to Banner to determine how best to proceed.</p>
66	1098T	Accounts Receivable process TSRTAF creates an extract report for 1098T, this report can be run with a population selection which can be used to separate populations by campus code.
67	Check Writer	It is common for a client to have a third party check writing software that gets a flat file from Banner Finance. FABCHKP which is the printing of the AP checks triggers this process. It is after this process is run that the file is picked up.
68	Bank of the West	In processing of AP warrants (payments) if the vendor is set up to have direct deposit and when processing the payments on FAABATC the Direct Deposit button has been selected the payments for direct deposit will automatically be processed.
69	ProCard (VISA)	From Finance User Guide: FAPCARD, FAAINVT, You must create a process (such as SQL*Loader or Pro*C) that reads a bank PCard flat file containing credit card company information, then loads data into the Banner

		<p>Temporary Purchase Card Transaction file (FATCARD).</p> <p>For outbound account creation.</p> <p>Question for Finance Functional Consultant: For Finance P-Card is there a process that creates a flat file out of accounts, limit, expiration, etc...? <i>Response:</i> Yes, I think the process you are referring to is FAPCARD.</p>
70	Maas Measure C	GURFEED table and FURFEED process are used to load JV entries into Finance. The reconciliation process between the two systems will need to be a custom process.
75	Utilities	GURFEED table and FURFEED process are used to load JV entries into Finance.
78	MBS Missouri Book Store (FH, DA) & Food Service DA	GURFEED table and FURFEED process are used to load JV entries into Finance.
80	BlackBaud Student Accounting System -- reporting to chancellors office state 311 reporting	GURFEED table and FURFEED process are used to load JV entries into Finance.
81	Child Development Center	Cash receipts can be entered directly into Banner Finance. These postings will be entered directly into the General and Operating Ledgers.
83	Legacy HR to Banner Finance	Any and all interfaces into Banner Finance come through the GURFEED table as journal vouchers.
52	Legacy Advancement to Banner Finance	Any and all interfaces into Banner Finance come through the GURFEED table as journal vouchers.
104	Legacy HR with SIS Plus (Budget)	Banner provides functionality for uploading budget information via excel spreadsheet, process is called FUPLOAD.
No Sequence #	Legacy Student AR to Banner Finance	Any and all interfaces into Banner Finance come through the GURFEED table as journal vouchers.
No Sequence #	Banner Finance to Legacy Student (Student Refund Checks)	Any and all interfaces into Banner Finance come through the GURFEED table as journal vouchers.
9	Degree Check	The report can be run for a population selection so the report can be separated by campus.
11	Enrollment Verification	The report can be run for a population selection so the report can be separated by campus.
37	EDI Smart	Upload of transcripts in xml format is supported by baseline Banner functionality. PDF format is not supported.
41	Email communications	Luminis Targeted Announcements and Group communications can provide this functionality.