ASSESSMENT OF SIS REPLACEMENT OPTIONS
REPORT FOR

UNIVERSITY OF CINCINNATI

PRESENTED TO:
SIS Replacement Project Leadership:
Executive Sponsors, Steering Committee and Project Team

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EXECUTIVE OVERVIEW

A renewed sense of urgency for improving higher education's accountability, transparency, and performance is in place—the result of a perfect storm of state budget challenges, the ongoing transition from a manufacturing to a knowledge economy, and the inability of the value of higher education to be appropriately articulated. Students, parents, accreditation agencies, and other external constituencies are demanding more from higher education, searching for an overall return on this investment from the student, state, and federal perspective. Issues requiring attention include increasing degree completion and decreasing the achievement gap, as well as changing the focus from access to success and from seat time to competencies. As with all aspects of learning, these challenges cannot be met with simple changes. Institutions must strive to acquire, integrate a comprehensive student information system, which provides support for, and perhaps a home for learner resource management solutions grounded and informed by analytics or "actionable intelligence" in all institutional areas—particularly in learning.

Core student systems and third party solutions provide the foundation for the student enrollment, tracking, and education planning needed for improved student success. Institutions like University of Cincinnati (UC) by themselves will not be able to build systems comprehensive enough or fast enough to stay ahead or even with the demand of strategic enrollment management, degree path concierge, and early alert/retention services. Even if UC were to double its development staff, the demand for these types of comprehensive learner relationship management systems (strategic enrollment, degree audit, guided registration, early alert, retention) are too sophisticated to build quickly and include all types of learners. To add to the pressure, state and national trends in legislation is tying access to state and federal funding to demonstrable student progress or student “success”. In other words, UC must have these solutions as part of their short-term technology strategic plans.

For these and other reasons, Collegiate Project Services has been engaged to guide UC through an assessment of available SIS (Student Information System) replacement options and an evaluation of UC’s institutional readiness to undertake a major system replacement implementation. Collegiate Project Services was selected due to its reputation of being unbiased towards the vendors that serve higher education. Collegiate Project Services conducted extensive interviews with UC staff, gap analysis comparisons of existing systems to available viable options, and system and staff readiness analysis to deploy a new SIS solution.

REPLACEMENT OPTIONS THAT WERE EVALUATED

The Collegiate Project Services assessment team in conjunction with the University of Cincinnati executive leadership identified two specific replacement directions for comparative analysis. These were:

1. Commercially available products
2. Combination of commercial and open/community source products
From these two replacement directions, three viable options are being considered. These represent an institutional strategy across UC’s entire administrative system suite:

1. Single Vendor Commercial Off the Shelf (COTS)
2. Multiple Vendor Commercial Off the Shelf
3. Multiple Source (Best of Breed from Commercial and Open Source Providers)

Each of these options was evaluated on multiple factors as illustrated in the summary chart on the following pages. These factors include a rationale for proposing the option, benefits and drawbacks of the option, a variety of costs (acquisition costs, maintenance costs, and implementation costs), information technology staffing and skill sets required, implementation timeline, and level of risk. The detail of this analysis and assessment is included with this full report.

Further analysis was completed to distinguish the specific solutions within each option, including a summary of compelling market factors for three COTS solutions as well as a primer on Kuali open source administrative systems. That information is included in the body of this report.

**STUDENT SYSTEM REPLACEMENT VARIATIONS BASED ON OPTIONS**

Taking into account the available implementation philosophies, institutional readiness, available systems in the market and evaluation of the environmental scans conducted by CPS, we see three options for UC to consider from an institutional perspective, taking into account UC’s current deployment of SAP for Finance and HR systems. These options are discussed fully in the body of this report:

**SINGLE VENDOR COTS ERP SYSTEM**

An ERP (Enterprise Resource Planning) system developed, maintained, and delivered by a single commercial vendor specializing in the higher education vertical market. ERP systems integrate internal and external management information across an entire educational organization—embracing finance/accounting, human resources, student relationship management, etc. ERP systems automate this activity with an integrated software application. The purpose of an ERP is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections to outside stakeholders.

UC would augment the existing SAP investment of HR and Finance with Student. The SAP for Higher Education & Research solution portfolio supports a wide range of key processes, including student lifecycle management. This additional module will allow UC to connect and streamline processes that support students, faculty, administrators, and alumni. Integrated systems will deliver support for admissions, enrollment for classes, registration, student financials, and degree auditing. Financial Aid

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1 Also commonly referred to as ‘best of breed’ commercial.
functionality would need to be provided by an SAP partner solution such as Sigma Systems.

**MULTIPLE VENDOR COTS ERP SYSTEM**

Some institutions favor solutions from different vendors procuring Finance and HR from one vendor and Student and Financial Aid from another. The ERP options to support institutions the size and complexity of UC can be integrated to share data, connect business processes, and facilitate the flow of information between all business functions even if the systems are from two different vendors.

For UC, this option would result in introducing another COTS vendor to UC’s existing ERP suite such as Ellucian or Oracle/PeopleSoft for all Student related modules or functions. This allows UC to pick a mature vendor in the vendor space that has the deep bench of customers, partners, functionality and expertise to address not just existing student management needs, but also the growing expectation to better manage students through the entire learning lifecycle.

**MULTIPLE SOURCE (BEST OF BREED) ERP SYSTEM**

A comprehensive set of hybrid higher education solutions to meet traditional ERP functions. This set of solutions could be composed of best-of-breed modules from commercial ERP vendors, open/community source solutions from an open source community, and single module commercial products. This system combination results from a selection of modules and/or point solutions that best support core student functionality and other related, ancillary functionality at UC.

For UC, this option would introduce solution from the higher education domain other than traditional large ERP vendors, namely community source options, reducing cost of acquisition, reducing cost of ownership and introducing ownership of the source code. This option also allows UC, if desired, the opportunity to contribute and influence development decisions.

**HIGH-LEVEL COMPARISON OF OPTIONS CHART**

The chart on the following pages provides a key roll-up of comparative factors for each of the options (Definitions for the costing items in the table is detailed at the end of the table).

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2 The Community Source Model is an open source model that blends elements of directed development, in the classic sense of an organization employing staff and resources to work on a project, and the openness of traditional open-source projects like Apache or Linux. The resulting software is available under an Open Source Initiative (OSI) approved license.

The distinguishing feature of the Community Source Model is that many of the investments of developers’ time, design, and project governance come from institutional contributions by colleges, universities, and some commercial firms rather than from individuals. These contributions may be tendered as the first phase of a project, and then additional work may be contributed on an ongoing, voluntary basis by those institutions with a continuing interest in the project.
<table>
<thead>
<tr>
<th>Option Description</th>
<th>Single Vendor Commercial Off the Shelf (COTS) Enterprise System</th>
<th>Multiple Vendor Commercial Off the Shelf (COTS) Enterprise System</th>
<th>Multiple Source Best of Breed – Commercial and Open Source</th>
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<td>License and implement a comprehensive ERP system application comprised of a proprietary code base created by its vendor. These information systems are traditionally mature, full-featured products with a large install base. The specific solution representative of this option for this report is SAP’s Student Lifecycle Management system and does not enjoy either full features or large user base in the US. The Student Lifecycle Management system is delivered with a number of integrated components and is capable of being integrated to outside applications and systems using published APIs or supported adapters. The solution includes Registration, Admissions, Waiting Lists, Cohorts, Grading, Assessments Fee Calculation Process, Fee Calculation, Scholarship/Sponsoring, Payments, and Collections. While there are many critical business functions represented, financial aid, academic history, degree audit, transfer articulation and alumni management will need to be delivered through integration with other vendors.</td>
<td>License and implement comprehensive ERP system applications comprised of proprietary code base created by multiple vendors. These information systems are traditionally mature, full-featured products with a large install base. The systems are often delivered with a number of integrated components and are capable of being integrated to outside applications and systems using published APIs or supported adapters. When choosing to implement multiple ERP vendors, institutions will typically split modules accordingly – Finance and HR from one vendor and Student or Student and Financial Aid from the other. The specific solutions considered within this option are Ellucian Banner and Oracle/PeopleSoft Campus Solutions. This option is also referred to as commercial ‘best of breed’.</td>
<td>Combine “fit” solutions from both commercially available and open source options. This direction would provide the school with mature, full-featured products, targeted new tools, as well as deploy progressive open source software solutions based on a code base that is often developed and managed by a consortium or community. Open Source systems allow users to freely access, install, and run the software for any purpose. Organizations may also modify the original software, redistribute copies of the original or modified programs, and share modifications with the community. Configuration, implementation, and ongoing maintenance are the responsibility of UC and may be managed in conjunction with an experienced open source partner if desired. This direction enables UC to truly pick from a wide range of solutions as long as they fit the functional, strategic, resource and timing goals of the institution. The specific solutions considered within this option are Kuali student supplemented with one of the commercial solutions already listed, or other point solutions.</td>
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<td>Rationale</td>
<td>Single Vendor Commercial Off the Shelf (COTS) Enterprise System</td>
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<td>A regularly updated, full-scope suite of modules (student, fin aid, HR, finance) that seeks to maximize business benefit, ROI, and capability in one or two implementation cycles. Able to share data seamlessly or minimally through integration application programming interfaces to UC’s existing HR and Finance modules and integrated point-solutions.</td>
<td>Regularly updated, full-scope Student solution (including Student and Financial Aid) that maximize business benefit, ROI, and capability in one or two implementation cycles. Able to share data seamlessly or minimally through integration programming interfaces to minimize double entry or duplication of effort by divisions and institutional offices between UC’s existing HR and Finance modules and shared integrated point solutions.</td>
<td>Combined open “built-by-higher education for higher education” customized option with a regularly updated, vendor developed option, providing flexibility with maturity and varied support options. An integrated system customized to higher education needs and the ability to retain control of future development and direction of the system through vendor and community license, cooperative development, and intellectual property rights models.</td>
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<td>Benefits</td>
<td>• Accelerated transformation of technology and platform to modern standards and market popular functional solutions. • Sets in place best-practices traditionally improving efficiencies and reducing duplicate processes or effort. • Process typically provides opportunity to train or retrain knowledge workers. • Respected and solid software vendor with a healthy network of professional service experts to implement and support the system long term.</td>
<td>• Adds additional options to accelerated transformation of technology and platform to modern standards and market popular functional solutions. • Allows for greater choices in meeting functional gaps • Reduces risk of institution relying on one technology road map and single vendor viability. • Reduces vendor-lock discouraging increased support fees and platform adoption.</td>
<td>• Pick and choose best tools the market has to offer • Accelerated transformation of technology and platform to modern standards • Lower cost option upfront and ongoing • Consortium support with other institutions of higher education allows for greater voice in system development. • Own source code for open source options. • Decreased risk of single vendor shortcomings and lock-in.</td>
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| **Drawbacks**        | • Significant financial investment for implementation costs and some support fees.  
  • Moderate change for users  
  • Preconceived notions about commercial systems  
  • Innovation is often slow and behind point solutions.  
  • Customer’s ability to provide services is often gated by support or product roadmap of vendor.  
  • SAP SLCM has missing functionality of modules specifically articulated as a requirement by UC – namely Financial Aid and Advancement. These modules could be provided through third party integrations. | • Significant financial investment for software license and support fees.  
  Added integration costs to single vendor option.  
  • Moderate change for users  
  • Preconceived notions about commercial systems  
  • Innovation is often slow and behind point solutions.  
  • Customer’s ability to provide services is often gated by support or product roadmap of vendor.  
  • Multiple technology middleware platforms may need to be supported – reduces ability to cross train support staff. Could increase cost of operation, ownership and hardware footprint. | • Added integration costs to COTS option.  
  • Potentially multiple middleware platforms to support – could increase cost of operation, ownership and hardware footprint.  
  • Integration complexity would be introduced  
  • Full open source student module not currently available  
  • Significant staff investment may be needed to develop, implement and maintain  
  • Although support ecosystem is in place, user base not as broad or mature as Multiple Vendor COTS |
| **Life Span**        | 15 – 20 years                                                 | 15 – 20 years                                                 | 15 – 20 years                                               |
| **Time to Solution** | 2-3 years                                                     | 2-3 years                                                     | 4-5 Years                                                   |
| **Strategic Alignment** | Low-Moderate                                             | High                                                          | Moderate                                                   |
| **ROI Risk**         | Low to Medium - The single vendor results in tighter integration; upgrades result in less disruption. The ROI risk decreases relative to the effectiveness of functionality match and technology performance. | Low due to established best practices, existing and established functionality, historical attention to customers and customer needs. | Medium due to the potential lower cost of this option (no software cost); shared costs and risk with other Kuali partners; but missing functionality and prolonged schedule increase risk from other options |
| **Risk**             | Medium due to missing functionality and small peer community for Student Functionality specifically | Low due to strong feature function capabilities, strong company viability, and large user base. | Medium to High due to unfinished feature set for student and the impact the timeline has to the project goals and timelines |
## Total Costs to UC

**Single Vendor Commercial Off the Shelf (COTS) Enterprise System**
- Acquisition – $1.635M
- Implementation – $14.4M
- Hardware – $770k-$1.115M
- Contingency – $2.5-$2.6M
- Other Costs - $4.9M

**Total Project Cost:** $42.7M - $43.1M

**Multiple Vendor Commercial Off the Shelf (COTS) Enterprise System**
- Acquisition – $3.65M - $4.32
- Implementation – $10.8M - $11.7M
- Hardware – $770k-$1.115M
- Contingency – $2.29M - $2.58M
- Backfill – $18.5M
- Other Costs - $4.9M

**Total Project Cost:** $40.9M - $43.2M

**Multiple Source Best of Breed – Commercial and Open Source**
- Acquisition - $0
- Implementation - up to $7m over 5 years (plus UC labor investment into Kuali project)
- Hardware Cost - $770k-$1.115M
- Contingency – $1.17M - $1.22M
- Backfill – $18.5M
- Other Costs - $4.9M

**Total Project Cost:** $32.3M - $32.8M

## Key Comparison Factors

### Single Vendor
- Lowest risk, but not lowest cost
- Quick benefit to campus community features
- Low integration cost
- Missing some functionality - Financial Aid, Advancement
- Shared vendor expertise across campus

### Multiple Vendor
- Lowest risk, but not lowest cost
- Quick benefit to campus community features
- Additional integration costs
- Possible additional middleware platform
- Additional training and support

### Multiple Source
- Highest risk due to the fact that Kuali does not currently offer a full suite of ERP modules and the timeline to completion is realistically 4-5 years out for student.
- Potentially TCO savings over time
- Increased control of technology, roadmap, functionality
- ERP conceptual functions gained such as simplified chart of accounts, Student Concierge and Demand Analysis from open source modules

## Pick this Option If:

### Single Vendor
- UC is willing to accept vendor’s functional capabilities and future roadmap and is committed to transforming and conforming its business processes to best practices required by integrated vendor software. Information systems can be easily integrated with other necessary components and systems both now and in the future.

### Multiple Vendor
- UC is willing to accept vendors’ functional capabilities and future roadmaps in exchange for increased flexibility of choice and domain expertise. Committed to transforming and conforming its business processes to best practices required by integrating multiple vendor offerings. UC is ready to support multiple middleware platforms if necessary.

### Multiple Source
- UC wants to receive innovative solutions from both the vendor and open source communities to achieve required functionality or the institution doesn’t want to continue to pay license and support for vendor options and capabilities. UC wants full flexibility to choose best of breed options and is comfortable with the integration effort required. UC is ready to support multiple middleware platforms.
 Definitions for cost categories referenced in the above table:

**Acquisition Costs** include one-time costs for software and any required 3rd party software licenses and database licenses.

**Implementation Costs** include services provided by the SIS implementation vendor AND recommended independent consulting services.

**Hardware Costs** include test and production server, storage, switch, network cards, racks, battery back-up acquisition and maintenance costs over 5 years. The higher end of the spectrum would include higher quality components. Costs would increase if infrastructure enhancements, disaster recovery, high availability and virtualization are desired.

**Contingency** is a 15% premium on all acquisition, implementation costs and hardware costs, to provision for unplanned scope changes and other unforeseen project expenses.

**Backfill** is included for key functional, technical and project management positions at UC. These costs estimates were developed by UC based on the detailed recommendations for functional, technical and project resources backfill completed as part of this assessment.

**Other Costs** include project space requirements, other software (e.g. Performance testing, monitoring, etc.), equipment for team members, replacing UC’s mainframe, and travel/training associated with the project.

**Not included in these estimates are annual recurring costs, or annual maintenance fees associated with licenses and hardware.** Also not included is an old system elimination credit, which takes into account expected savings from phasing out the old system.

The “Strategic Market Factors Chart” is included in the body of the report. It examines other factors by the specific solutions considered by UC.
RECOMMENDATION SUMMARY

CPS strongly holds that there are three viable approaches for UC recognizing that they each carry different levels of cost, risk and responsibility. This section details our recommendation of the three options evaluated in this report. We strongly encourage UC to complete its own vetting of the options and develop a decision process using a weighted criteria approach to ensure that the University has received and applied our analysis to determine the best path forward for UC.

MULTIPLE VENDOR COTS SYSTEM. Collegiate Project Services favors a Multiple Vendor COTS approach for UC based on our assessment of institutional functional need, skill-set readiness, effort required to achieve solution, and both long and short term risk. We feel confident making this recommendation based on the availability of well-respected, full-featured and established products that have proven the ability to provide all major features and functions without unneeded integration, but at the same time are able to integrate well with point solutions and modern infrastructures and solutions. Viability of this direction will be vetted as more information gathering, skill set assessment, and detailed gap analysis is completed (which would be part of a formal procurement process).

The culture at UC and alignment with the SIS Replacement Project charter timeline and goals lends itself to adoption of this type of solution. Functional staff are accustomed to deploying systems that specifically support their specific business process needs and IT staff have developed exceptional skills at integrating multiple systems in a seamless, user friendly environment. Coupled with best practice and business processes that are already built into the ERP solution, an extensible established platform will give UC the peace of mind of a supported system with a large support base, but also the ability to tie to solutions currently in place or being introduced to the market after implementation.

MULTIPLE SOURCE OPTION. Multiple Source remains an interesting option for UC, but it presents some challenges. Multiple Source combines established and new SaaS (Software as a Service) options with Community Source development. This option really only makes sense if the University has the interest and time to become an investing partner of the Kuali Student Project. This would commit the institution to 5 years of development contributory effort to ensure the system being built meets the institutions specific needs. After this period of development and investment the institution would still need to maintain the implemented system along with other Kuali institutions.

At this point in the community’s development, UC could still be a strong influence on the community, but the project would require of level of commitment that the entire institution would have to “sign on” for. The risk is measurable, but not insignificant. In order to meet the 2017 or 2019 deadlines to meet institutional goals, the Multiple Source option would need to have all of the functionality desired ready today, and this is not the case. It is for this reason CPS has listed the project as having a Medium risk of reaching ROI and Medium to High risk to providing the institution with the sought after functionality in the time desired, and therefore has not recommended this option for UC moving forward.