



University of Arizona Mosaic Project Financial System Review



April 2010



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Executive Summary

The Financial Systems Review Team (FSRT) was chartered in February, 2010 to examine the key differences between two enterprise financial system applications, PeopleSoft Financials (PSF) and the Kuali Financial System (KFS), and make a recommendation on which application provides the most advantageous path to a successful UA implementation given the strengths and weaknesses of each product, and our collective experience to-date. In reading this report, it is important to understand that the Review Team utilized information provided by the software providers and peer institutions in completing our evaluation. Due to the limited implementations of both KFS release 3.0 and PSF 9.x, the Review Team made certain assumptions based solely on the information received from the software providers and peer institutions on the functionality and technical capabilities of the software packages. Evaluation of the products was conducted in four primary areas of concern: Functional Requirements, Technical/Support Criteria, Risk Factors and Application Cost.

Functional Requirements

The Review Team believes that KFS is better suited to meet the UA's needs at both the Central Administrative level and the College/Department level based on the following:

- KFS is designed specifically for the needs of Higher Education.
- KFS provides configurable eDocs for most business transactions that come embedded with business rules and workflow as an out-of-the-box deliverable. This was identified as a critical piece of required functionality for the UA by the Review Team.
- KFS provides configurable workflow for automatic routing and approvals that can be uniquely customized at the College/Department level as an out-of-the-box deliverable. This was also identified as a critical piece of required functionality for the UA by the Review Team. PSF 9.x provides an Approval Workflow Engine that is embedded in many transactional processes but would likely be more difficult to configure and/or customize to meet the UA's needs.
- The creation, maintenance and global update of sub-account, sub-object code and sub-unit Chart of Accounts fields and attributes is better suited to the UA's needs as delivered in KFS.
- PSF has a broader range of functional capabilities across the entire Financials suite of applications but many of these capabilities are not required by the UA.

Technical/Support Criteria

The Review Team believes that PSF offers a more proven technological architecture, an enhanced toolset and an expansive resource pool based on the following:



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- PSF is a more mature software application backed by Oracle Inc. and implemented at thousands of customers including hundreds of Higher Education institutions.
 - PSF delivers a more robust, comprehensive, feature-rich set of system development, implementation, integration, optimization and change management tools designed specifically for use within PSF. KFS relies primarily on similar tools available under the umbrella of the Java development structure that do not directly relate to the specifics of the KFS architecture.
 - There is an abundance of PSF technical and support resources available as developers, consultants and implementation partners. The availability of similar resources for KFS is much more limited due to the newness of the product.
 - The Kualu Community model, if sustained, offers a unique opportunity for product growth as Kualu Foundation-qualified institutions or collaborating institutions make application fixes, modifications and enhancements and contribute the source code back to the entire Kualu Community. There has not been enough experience throughout the Community yet to make assumptions about the measurable value of this opportunity for the long-term.

Risk Factors

The Review Team believes that both KFS and PSF contain similar levels of risk based on the following:

- Changing implementation from KFS to PSF at this time, given all of the UA efforts to develop KFS and promote user-acceptance of the product, coupled with campus perceptions of the PS HCM implementation, could create a backlash among functional end-users and central administration making it difficult to implement any enterprise financial system other than KFS.
- The Kualu Foundation model represents a unique risk-reward scenario as an open source product. The risks to develop, implement and sustain are higher than a vended solution but the payoff in terms of an enterprise financial solution for the specific needs of Higher Education would be very significant.
- Recognizing that most new application deliveries contain bugs, the complexity of the KFS implementation will be impacted.
- Changing to PSF delays the implementation of the enterprise financial system by an additional six (6) months beyond the projected KFS implementation timeline, deterring UA's ability to fulfill the reported and accepted corrective action plan beyond the adequate but manual process currently in place. The practice in place was established as an interim measure with plans to implement a new financial enterprise system.
- Without continued growth of the Kualu Foundation, its sustaining partners and third-party support resources the UA may eventually 'own' the KFS product and pay a premium for the necessary resources to sustain it, or be faced with a complete system replacement if the software becomes stale.



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- Implementing PSF, even with customizations, may not reduce the need for Colleges and Departments to maintain shadow accounting systems to the same extent that an implementation of KFS will reduce those needs.

Application Cost

The Review Team believes that KFS is a more affordable solution than PSF based on the following:

- Given all of the effort on the KFS implementation as of April, 2010, a PSF implementation would cost \$4.1 million more, using an implementation partner approach, than completing the remaining work for the KFS implementation.
- There is a projected difference of \$300,000 in the ongoing costs for both products, with Kualu estimated to be more costly to maintain over time. With a KFS implementation the University assumes a higher cost for development staff to support a product in its early release cycle and to insure against the possibility that the Kualu Foundation may not continue. With a PeopleSoft implementation the University commits to a higher degree of customization that will require support on an ongoing basis. Both of these factors result in assumptions about the potential levels of additional staff support needed for KFS and the potential number of modifications required to customize PSF within the UA environment. The overall differential estimate can be varied significantly by altering the assumptions related to how many additional staff are required to maintain KFS after go-live as opposed to how many modifications are made to PSF. The Review Team was unable to reach consensus on the appropriate assumptions to include on either side and cannot, with confidence, assert how appreciable the overall difference for ongoing costs would be.
- The contingency costs for KFS are higher than PSF but the Review Team could not ascertain a reasonable formula for determining an appropriate differential ratio.

Using the data from each area of concern, the Review Team established that each product currently offers a different path to end-design and implementation, and offers a different experience for end-users. A description of the key elements of each path is as follows:

Kualu Financial System

- Go-live on version 3.0 in April, 2011
- Implementation managed by internal UA resources with staff augmentation as necessary

PeopleSoft Financials

- Go-live on version 9.1 in October, 2011
- Implementation managed through use of an implementation partner



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| <ul style="list-style-type: none">▪ Reliance on limited technical resources and Kualu Community support during configuration, testing and implementation▪ Continued creation and refinement of Java or other 3rd-party tools to produce an efficient, effective and optimized technology stack▪ Use of eDocs and Workflow designed to closely match existing internal business processes and routing mechanisms▪ Effort Reporting will be done within KFS using configurable workflow and approval and automatic posting to the Labor Ledger▪ Ability to meet changing functional and regulatory needs by coding internally or collaborating with other Kualu institutions and potentially contribute back to the Kualu Community according to prescribed processes▪ Patch/fix and maintenance pack releases by the Kualu Community as partner schools develop solutions and contribute them back▪ New product features and enhancements developed by sustaining partners provided via major software upgrades released by the Kualu Community and scheduled in Quarter 4 of each calendar year | <ul style="list-style-type: none">▪ Large pool of technical resources to draw from during configuration, testing and implementation▪ Use of delivered PS Tools for system configuration, implementation, integration, optimization and change management to produce an efficient, effective and optimized technology stack▪ Use of Pages and the Approval Workflow Engine that would need customization to match existing business processes and routing mechanisms▪ Effort Reporting would need to be done via a 3rd-party system at an additional cost and fed into PSF as a bolt-on▪ Ability to request functional and regulatory changes of Oracle and utilize their Higher Education User's Group and Product Advisory Group for Financials to leverage support among institutions for common institutional needs, or ultimately develop a bolt-on internally▪ Regular patch/fix, application bundle, maintenance pack and service pack releases by PeopleSoft in support of the core product▪ New product features and enhancements provided via minor software upgrades released by PeopleSoft every 12-18 months and major software upgrades released every 2-4 years |
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Conclusion

There is no clear, consensus ‘right’ choice to be made. Each product is unique, from its system architecture to its service and support model to its end-user experience, yet both products are capable of meeting the vast needs of an enterprise financial system deployment. KFS tends to meet the needs of end-users, especially at the College/Department level, more thoroughly. PSF tends to be a safer alternative from a technology architecture and support standpoint. Each product has significant risks associated with its implementation and sustainability that can only be mitigated to a certain extent. KFS more resembles a home-grown, traditional ‘build’ software application that could require significant UA resources to maintain if the Kualu Foundation model is not sustained for the long-term. PSF is a standard vended solution that comes with the inherent dependency on the vendor for product growth in an environment where Higher Education represents a minority of overall product use. Both products are expensive and require significant effort to implement, with a complete PSF implementation costing more than finishing the work to implement KFS.

After consideration of all information available to the Review Team during its review, including Vendor Questionnaires, Peer Surveys, Gartner research, internal staff interviews and Navigator Management Partners experience, the Review Team recommends to proceed with the implementation of the Kualu Financial System. It is our opinion that the functional advantages that KFS offers, especially those related to eDocs, Workflow and Effort Reporting, outweigh the technical advantages that PSF offers, as well as any risks associated with a KFS implementation. The Review Team also strongly recommends the UA makes an expeditious decision on the financial system and commits to providing the short and long-term resources necessary to successfully implement and sustain the entire university enterprise system. This includes a commitment to implement future software upgrades as the upgrades become available and participate fully in the relevant community of users in support of the chosen solution.



Purpose and Approach

Purpose

The Mosaic program is considering an implementation of Kuali and PeopleSoft financial applications for the University. The Steering Committee requested that the Review Team provide analytical information to facilitate a decision about the go-forward approach.

Approach

The Mosaic Executive Steering Committee established a Financial System Review Team to gather facts concerning the two potential software solutions and provide a recommendation. The Financial System Review Team, coordinated by Joel Hauff, Arizona Student Unions and supported by consultants, includes:

Cathy Bates, UITS	Hank Childers, Mosaic Project
Gary Esham, College of Optical Sciences	Caroline Garcia, Research
Sarah Hiteman, College of Medicine	Duc Ma, Financial Services Office
Mark McGurk, Financials Services Office	Kathy Whisman, Budget Office

Members of the Review Team took these steps to gather pertinent data and provide the results:

- Identified areas/categories of data to be obtained
 - Functional Requirements, Technical Support Criteria, Cost, and Risk Factors
- Developed a “questionnaire” for completion by each software provider
 - With questions in each area/category
- Developed an “interview guide” for discussion with “peer institutions” who have implemented Kuali or PeopleSoft
 - Kuali group: California at Davis, Colorado State, Cornell, Michigan State, Southern California
 - PeopleSoft group: Florida, Florida International, Michigan, Minnesota, Ohio State
- Interviewed people on campus who are related to the implementation:
 - Melanie Cooley (regarding go-live and on-going Training)
 - Cindy DeMaio (KFS project management)
 - Kymber Horn (KFS project management)
 - Ed Murphy (regarding UITS infrastructure)
 - Kate Rehkopf (regarding Help Desk)
- Leveraged knowledge of consultants
 - Gartner Group staff and Gartner Publications
 - Navigator Management Partners staff
- Developed, reviewed, and delivered this report



Findings

Business Functionality

Higher Education Market Approach

PeopleSoft

PeopleSoft's approach to servicing the Higher Education customers has two main components. The first is a goal to continue to develop and improve upon their core applications offering in order to meet the unique needs of its Higher Education and public sector clients. Most notably PeopleSoft has developed specific functionality to meet the financial management requirements related to:

- Fund Accounting
- Configurable Budgetary Controls/Expenditure Monitoring
- Encumbrance Processing/Commitment Control
- Grants Management

Additionally, PeopleSoft has developed the Campus Solution application suite for addressing the student administration and alumni development needs of Higher Education clients.

The other aspect to PeopleSoft's Higher Education approach is the support of and participation in the creation of users groups that support Higher Education clients, most notably the Higher Education User Group (HEUG). The HEUG's mission is "to facilitate sharing of ideas, information and experiences among its members, and to provide a unified and effective voice to Oracle on all issues involving the use of Oracle application software in the Higher Education community."

Kuali

Kuali is a growing community of universities, colleges, businesses, and other organizations that have partnered to build and sustain open-source administrative software for Higher Education, by Higher Education. The Kuali Community consists of sub-communities that collaborate on enterprise software systems, including the Kuali Financial System (KFS), Kuali Coeus (KC) for research administration, and Kuali Student (KS). In early 2009, Kuali Rice was added to this portfolio as a fully funded project to evolve a middleware infrastructure common to the other Kuali software. Late 2009 brought the Kuali Online Library Environment (OLE) and the Kuali Ready projects on board.

Each of these software systems and their supporting communities are referred to as Kuali Projects, even though they are on-going, sustained efforts.



The Kualo Projects are tied together by the Kualo Foundation, a non-profit organization that coordinates the efforts of partners, manages and protects the community's intellectual property, and handles common concerns among the Kualo Projects. The Foundation staff works with Community members to address the following concerns:

- Legal Services
- Intellectual Property
- Financial Management
- Hosting Services
- Community Coordination
- Collaboration Infrastructure
- Quality Assurance
- Communication Management
- Event Management
- Licensing
- Public Relations

Summary of Functionality Reviewed.

The Review Team concentrated its evaluation of Kualo and PeopleSoft capabilities in the processing areas related to finance operations and reporting, accounts receivable, procurement operations, capital assets, post-award grants processing, effort certification and endowments. Both the PeopleSoft and Kualo application have modules that address the University's requirements in these process areas except for the following differences:

- Effort Reporting: The Kualo application contains Labor Ledger and Effort Certification modules to support effort reporting.
- Procurement: PeopleSoft has a Travel and Expense module, while the Kualo travel and expense module is still under design and development.
- Endowments: The PeopleSoft Cash Management module appears to address the endowment reporting and accounting requirements specified by the University. The Kualo Foundation, with the support of the University of Arizona, is currently developing an endowment module which is expected to provide similar functionality.

There is also a difference in the maturity of each application, as defined by how long the application has been available and the number of releases that have been issued.

- Kualo has had three releases to date: Kualo Test Drive demonstration in March 2006, release 1.0 in October 2006 and release 2.0 in November 2007. The final release of the baseline functionality, release 3.0, was released in October 2009.
- PeopleSoft released its first financial module in 1994. Since then there has been 7 major PeopleSoft financials application releases, three of them occurring after Oracle's acquisition of PeopleSoft. The latest version 9.1 was released in January 2010.



Strengths of Core Capabilities and Ability to Meet UA's requirements

After reviewing the core capabilities of both applications it was concluded by the review team that both applications, at a high-level, could meet the majority of the University's central administrative financial requirements. There are differences in approach and/or the way the applications process data but based on our approach they both appear to contain the core capabilities to manage the University's financial reporting, procurement, capital assets, and post-award grants processing requirements. There are vast differences in the look and feel of the applications, but it is not apparent whether either application would provide for a better user experience; they both have their unique advantages and challenges.

The table below summarizes the key differences between the applications in the areas the University determined to be the most critical.

Key Differences

Function	Kuali	PeopleSoft	Comments
Workflow	<ul style="list-style-type: none"> Transactions are processed through eDocs which have embedded routing and business rules. Provided that the required routing can be achieved through the nodes defined within the eDoc and that the configurable business rules are adequate, there will be no technical development required to configure the eDoc. 	<ul style="list-style-type: none"> Application Workflow Engine (AWE) can provide the technical foundation to configure and define approval routing for transactions. AWE routing nodes are not hardcoded into transactions and can be added or deleted as needed. Transactions without embedded AWE underpinnings may need to be customized. Depending on the type of transaction and /or business process, delivered editing may need to be customized in order to define required business rules. 	<ul style="list-style-type: none"> AWE provides the same routing capability as Rice but does not have the ability to define business rules. The biggest complexity in defining workflow for either solution will be the standardization of processes. The more variance between Colleges and Departments, the greater number of workflow definitions that will need to be defined.
Procurement	<ul style="list-style-type: none"> 1099 processing and reporting functionality was designed and developed by the University of Arizona. 	<ul style="list-style-type: none"> Has delivered 1099 processing and reporting. 	
Travel and Expense	<ul style="list-style-type: none"> Until a travel and expense module is developed by Kuali and/or by the University of Arizona, travel expenses will need to be processed as disbursement vouchers. 	<ul style="list-style-type: none"> Has an application that supports Travel and Expense processes. 	<ul style="list-style-type: none"> KFS has outlined the specifications for the future development of a travel and expense application. It is yet to be determined when it will be available.
Chart of Accounts	<ul style="list-style-type: none"> Chart of Account functionality coupled with eDocs will allow the University to maintain a centralized approach to specific aspects of the COA components, while at the same time enabling Colleges and Departments to further divide their organizations as they see fit. 	<ul style="list-style-type: none"> Ability to use trees to: <ul style="list-style-type: none"> Define multi-leveled reporting structures Summarize data Review account data across COA components. 	<ul style="list-style-type: none"> Leveraging PeopleSoft Security, parts of the PS COA could be released to and administered by Colleges and Departments to support their reporting needs. The difference between PS and KFS is that there is no embedded approval processing when creating/updating COA components in PS.
Effort Reporting	<ul style="list-style-type: none"> Delivered effort reporting functionality which enables: <ul style="list-style-type: none"> Routing of effort reports to the PI and fiscal officers associated with an account. 	<ul style="list-style-type: none"> Does not deliver any tools/process to assist in effort reporting. 	<ul style="list-style-type: none"> While PeopleSoft does not deliver any effort reporting functionality, the components and data that are necessary to certify reported effort exist. Third-party applications that integrate with



Function	Kuali	PeopleSoft	Comments
	<ul style="list-style-type: none"> ○ Updates to the effort and amounts associated with an account. ○ The creation of salary expense transfer transactions which account for the changes made. ○ Ability to lock salary expenses after certification. • Delivered effort reporting functionality may still need to be modified to meet all the University's requirements. 		<p>PeopleSoft could be purchased or the functionality could be developed in PeopleSoft using Application Designer.</p>
Pre-Encumbrances and Encumbrances	<ul style="list-style-type: none"> • Ability to perform soft encumbrances according to University requirements. • Ability to view the effect of pre-encumbrance transactions via GL inquiries. 	<ul style="list-style-type: none"> • Ability to process multi-year commitments. 	<ul style="list-style-type: none"> • The ability to process multi-year commitments is a functionality that is being discussed as a future functionality for Kuali. However, the University does not deem this as functionality that would be used given its current budgeting policies and capabilities. • PeopleSoft would process soft encumbrances by managing the budget within the Commitment Control Ledger. The effect would be the same as a KFS soft encumbrance although the process would be different.

Key Points/Facts/Comments:

- Per peer surveys, PeopleSoft:
 - Workflow, mostly centered on the procurement processes, was the most customized part of the application.
 - Peers that have implemented and / or plan to upgrade to Contract & Grants version 9.0 believe that the application is vastly improved and can eliminate most prior customizations utilizing delivered functionality.
 - Asset Management was functional but peers cited issues with the integration with the procurement application, reconciliation, and asset transfers.
 - Schools which upgraded or are in the process of upgrading from version 8.4 to 9.x expect to be able to significantly reduce their customizations. This was largely due to new enhanced functionality and / or a desire to modify business processes to match the application's business processes.
- Per peer surveys, Kuali:
 - Peers were pleased with their Kuali implementation and/or with the progress that had been made on an ongoing implementation.
 - Application has been well received by the user community.
 - Configuring Workflow using eDocs has been a success. Some peers are utilizing eDocs for transactions/processes outside of KFS.



Other Functional Considerations

When reviewing the capabilities of the two applications we found that they both contained certain functionality that was unique to their architecture. The Table below details these differences.

Function	Kuali	PeopleSoft	Comments
Effective Dating / Change Control	Each E-Doc will maintain a history of who updated the E-Doc and what changes were made.	<p>PeopleSoft uses a date field (effective date) for when the data is to be effective and optionally a status field that determines if a value is active and/or inactive. Who effected the change will be tracked by user id. If necessary record auditing can be enabled in order to track all changes made to a particular record.</p> <p>PeopleSoft leverages effective dating functionality throughout the majority of its configuration attributes, including customer and vendor definitions.</p>	<p>Both Kuali and PeopleSoft will provide an audit ability/historical view of changes that have been made to configuration. The key difference is that PeopleSoft will use the effective date of the configuration attribute to determine what value is effective for a given transaction, whereas Kuali will always use the most current configuration to process a transactions.</p> <p>Examples of effective dating:</p> <ul style="list-style-type: none"> As used within Trees – Ability to maintain and report on a defined reporting structure at a given point in time. Ability to enter future dated customer / vendor changes.
Batching Processing	Batch processes do not have embedded logic to identify which transactions are pending, in process, or complete. This requires processes to be run in specific order or else there is a risk of data corruption or loss.	PeopleSoft batch processes tag all transactions with a process instance and/or status field(s) that detail the status of a particular transaction enabling the application to run concurrent processes.	Within the KFS environment users will not be able to enter or act upon transactions while the system is running its batch processes due to possibility of that data being lost or corrupted.
Run Controls	Batch processes process all pending transactions.	Batch processes leverage run controls that allow users to enter run parameters that define which data sets are to be processed.	The utilization of run control parameters provides more flexibility for process scheduling and the distribution of system resources.
eDocs	eDocs are electronic forms used to enter and route data throughout the application. eDocs were specifically designed to simulate the university's paper based business processes and ease data entry. eDocs come delivered with a predefined routing and business rule structure that is configurable.	Uses page(s) and page group(s) for data entry. PeopleSoft pages are generic and support the PeopleSoft designed business processes. Certain transaction pages come embedded with AWE functionality that allows for approval routing. Business rules are embedded in page edits and/or defined within configuration values.	<p>The eDocs delivered within KFS were designed, in part, by the requirements specified by the University and therefore closely match the University's current business processes and requirements.</p> <p>eDocs are less complex to configure as compared to AWE. The University anticipates that Colleges and Departments will be able to configure their own eDocs to support their business rules. This most likely would not be the case with AWE.</p>



Function	Kuali	PeopleSoft	Comments
Operational Reporting Capabilities.	Does not come delivered with any reporting and/or query tools which allow users to perform direct inquiries off the transactional system. Users may export data within search results and/or data that is displayed in eDoc grids. Additionally, Kuali delivers a limited set of operational, process assurance, and reconciliation reports.	<ul style="list-style-type: none"> Comes delivered with Query Manager, n/Vision, Crystal Reports, and SQR tools which allow users to directly query the database. Reports which are run through the PeopleSoft Report Manager can be scheduled and distributed per user instructions. Report output formats include PDF, HTML, and CSV. The application comes delivered with operational reports that were designed to support core business processes, application reconciliation, configuration review, and process assurance. Users also have the ability to export data within search results and/or data that are displayed in grids within pages. 	Under either solution the vast majority of reporting would be done out of the University's Business Intelligence environment. However, resources within FSO would mostly likely use the reporting capabilities contained within the PeopleSoft application to perform ad hoc analysis.
Global Changes	Ability to perform mass updates on accounts, sub-object codes, object codes and account delegates at both a centralized and decentralized level.	PeopleSoft provides functionality to perform mass updates of configuration and/or transactions. However, this functionality is ordinarily restricted to very few users and is considered a system administrative function.	
Multi-Currency Processing	Multi-currency processing is still being developed and enhanced in order to be able to process foreign payments.	Has robust multi-currency functionality embedded throughout the financial modules. PeopleSoft can support real-time currency translation and periodic currency revaluations. Multi-currency rates are maintained in effected dated tables.	
Supply Chain Capabilities	Does not currently offer any supply chain capabilities other than purchasing and receiving.	The Financials application platform is fully integrated with PeopleSoft supply chain modules including: <ul style="list-style-type: none"> Inventory Management and Fulfillment Supply Planning 	This could be of interest to Stores in the future but it is not a current requirement for the University.

Conclusion on Functionality

Based on the analysis performed by the Review Team it concluded that the functionality contained within the Kuali application was a better fit for the University of Arizona. The PeopleSoft application provides a greater depth and breadth of overall functionality within its application, but the University's current needs do not call for the use of this broader set of functionality. While there was not a significant difference between the core capabilities of the applications from a Central Administration perspective, from a College and Department perspective eDocs and effort reporting functionality within KFS gives Kuali a functional advantage over PeopleSoft as delivered. eDocs will enable to Colleges and Departments to better manage their own transaction routings, rules, and reporting requirements as compared to PeopleSoft. The delivered effort reporting functionality in Kuali would enable Colleges and Departments to certify their reported efforts and meet NSF audit requirements.



Application Technology

System Architecture and Tools Overview

Members of the Review Team conducted fact-finding in the area of technology and tools to provide an outlook for “long term” feasibility, costs, and risks in support of the mission-critical financial functions for the University.

- Gartner Assessment/Comments: “[Open Source Software (OSS)] is unavoidable over the midterm to long term. All organizations will be dealing with OSS, either through their direct and conscious selection or as a result of embedded OSS components in vendor-sourced applications. In order to proactively manage OSS, rather than reactively respond to it, IT organizations must establish principles to determine when applications, their underlying algorithms and associated code can and should be shared externally, as opposed to quarantined and protected.” [**Introducing Application Decision Spectrums**”; Gartner March 2010]

Technology Stack

The technical foundation on which an application is built and executed/operated directly affects key behaviors of the overall solution, including user experience, performance, reliability, and availability. Maintaining peak/optimal efficiency of the stack hardware and software components can best be accomplished through the use of effective products and tools by knowledgeable and experienced analytical resources.

The foundation architectures for the Quali and PeopleSoft financial applications of the University of Arizona are:

Architecture Tier / Component	Quali	PeopleSoft	Difference
Web Server			
▪ Hardware	Dell 2950 iii	Dell 2950 iii	
▪ OS	Red Hat	Red Hat	
▪ Software	Apache Tomcat	WebLogic Apache mod-shib	← (1)
Application Server			
▪ Hardware	Dell 2950 iii	Dell 2950 iii	
▪ OS	Red Hat	Red Hat	
▪ Software	Apache	Tuxedo	← (2)
Database Server			
▪ Hardware	Dell/EMC CX4-480	Dell/EMC CX4-480	
▪ OS	Red Hat	Red Hat	
▪ Software	Oracle DBMS 11.g	Oracle DBMS 11.g	



Key Points/Facts/Comments:

- (1) The PeopleSoft web tier includes an Apache module for Shibboleth to support UA web single sign-on access
- (1) The web server of a potential Kuali FMS is operating successfully to-date in the test and development environments
- (1) The web server of a potential PeopleSoft FMS is operating successfully in production for the UA HR/Payroll and Student systems
- (1 + 2) The Kuali web and application servers reside on the same physical machines whereas the PeopleSoft web and application servers reside on different physical machines; No significant performance, stability, or availability differences since the number of machines seems adequate to support the anticipated load and failover/availability requirements
- (1 + 2) Apache/Tomcat and WebLogic-Tuxedo have both been proven in production environments that are on par with the University

Apache Tomcat	WebLogic-Tuxedo
<ul style="list-style-type: none"> ▪ open source product controlled by the Apache Software Foundation (ASF) 	<ul style="list-style-type: none"> ▪ proprietary product maintained by Oracle-PeopleSoft
<ul style="list-style-type: none"> ▪ initially available in 2000; now version 6.0.26 	<ul style="list-style-type: none"> ▪ initially available 1995; BEA acquired in 1998; Oracle acquired in 2008; now version 11.g
<ul style="list-style-type: none"> ▪ estimated production usage exceeds 100 companies around the world, and includes Cardinal Distribution unit of Cardinal Health, Weather Channel, Wal-Mart 	<ul style="list-style-type: none"> ▪ estimated production usage exceeds 100 companies around the world

- Gartner Assessment/Comments: “The Apache Software Foundation (ASF) is much more than just the organization behind the successful open source Apache Web server. The ASF directs the development of more than 50 other projects — mostly based on Java or Extensible Markup Language (XML) — as well as the popular Apache Web server, Tomcat servlet engine and PHP scripting platform. The ASF has a proven track record in a number of technology areas and carries the respect of users and developers, including many commercial IT vendors.” [**“Apache Software Foundation can be a Technology Powerhouse”**]
- SUMMARY: No significant operational differences are anticipated

Architecture Integration

The efficiency and accuracy of the total financial solution is affected greatly by the effectiveness of the “interplay” across and between components: database ↔ modules ↔ other dependent systems. The mechanisms by which this integration occurs may be pre-existing (designed into the product) or built. Note that the designed integration often needs to be configured, and is also able to be customized for the institution’s needs and environment.



Integration Points	Kuali	PeopleSoft	Difference
Between Application Modules	<ul style="list-style-type: none"> Many rules are central and shared, many are defined for a module; possible differences can exist (intentionally or accidentally) 	<ul style="list-style-type: none"> Modules share configured rules 	← (1)
Between Application Modules and Database	<ul style="list-style-type: none"> Some fields that appear on different eDocs possess different attributes in the database but vast majority of fields that are shared are centralized 	<ul style="list-style-type: none"> Fields are shared between modules (single/common definitions) 	← (1)
External Systems	<ul style="list-style-type: none"> Need custom linkages to create outgoing feeds; provides scrubber to edit and load incoming GL transactions KFS uses a standardized and largely pre-built approach to batch-file import/export. The big difference is that there is no GUI to control it. So it's all done in code, but it is done to a common specification and lots of pre-built code such that you only have to write what is different 	<ul style="list-style-type: none"> Provides Component Interface tool processing to edit and load incoming data feeds Provides application message tool to configure links (synchronize data) between PSFT application databases Need custom linkages for outgoing feeds 	← (2)
Business Intelligence (BI) [Oracle EPM and OBIEE]	<ul style="list-style-type: none"> Need custom linkages to BI repository 	<ul style="list-style-type: none"> Provides Export Translate and Load (ETL) tool to create linkages to BI repository; some need customization 	← (3)

Key Points/Facts/Comments:

- OVERALL: PeopleSoft has been refined over 15+ years and multiple versions (current version 9.x) to provide integration design and capability; Kuali is much newer (about 4 years; current version 3.0) and is on the path of adding capabilities and features in the same evolutionary manner
- (1) The designed integration of Kuali presents the need for designers and developers (implementation and support) to increase “attention and care” so that they identify elements that are inconsistent between modules and adjust needed code and components accordingly; functional testing plans and processes should be developed to account for this possibility
- (2) For inbound feeds PeopleSoft provides the Component Interface tool that can accept batch file input and execute the corresponding online edit and load logic; KFS provides a “scrubber” process to edit batch GL transactions/entries which can then be loaded



- (2) For outbound feeds to non-PeopleSoft external systems custom processes are required for the potential PeopleSoft FMS implementation
 - PeopleSoft provides a configurable application message feature to transmit data between PeopleSoft applications; this can be used by the University to achieve data transfers between FMS and the HCM and the Campus Solutions systems
- (2) For outbound feeds to external systems custom processes are required for the potential Quali FMS implementation
- (3) To feed the Business Intelligence solution PeopleSoft provides a tool to define, map, and load data from a potential PeopleSoft FMS implementation; custom processes are required for the potential Quali FMS implementation
- SUMMARY: PeopleSoft provides more extensive integration; the effort to build and maintain the same system-to-system integrations will be higher with a potential Quali FMS implementation

Technical Tools

To support business needs optimally, tools are imperative to facilitate changing the product, creating new components, and supplying data and information to users.

Tool Set	Kuali	PeopleSoft	Difference
Application Languages	Java Spring Data Dictionary XML	Application Designer SQR COBOL XML	← (1)
Integration Tools	Kuali Service Bus Java tools Ant	Application Messaging Component Interface	← (2)
Development Tools	Java tools Spring Ant Struts	Application Designer SQR Application Engine	← (3)
“Debugging” Tools	Standard Java Debugger P6SPY for DB Tracing	PeopleCode Trace PeopleSoft Query	← (4)
Reporting & Data Access Capabilities / Tools associated with application	Delivered Standard Reports Inquiry pages Doc Search for inquiry	Delivered standard reports Pages for inquiry Query for ad hoc data retrieval nVision for reports XML Publisher for reports	← (5)
BI Reporting tools	Template reports & dashboards Discoverer DBI XML/BI Publisher	Template reports & dashboards Discoverer DBI XML/BI Publisher	
Batch Process Scheduling	Control-M Quartz Scheduler	Control-M Process Scheduler	
Code Version Management	Subversion (SVN)	Subversion (SVN)	
Upgrade management		DataMover tool Change Assistant tool	← (6)



		Change Impact Analyzer	
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Key Points/Facts/Comments:

- OVERALL: The PeopleSoft evolution has resulted in the provision of a number of tools as part of the product; some of the PeopleSoft tools are built specifically for the product; the provided tools are maintained by Oracle
- OVERALL: Kualo strategy, attention and effort at this time is focused on application capabilities, allowing customers to select and use the “free” or “fee” tools of their choice
- (1) PeopleSoft applications include components in Cobol (as well as proprietary PeopleTools), Kualo uses the open Java language; different skill sets are needed by KFS and PSFT implementation and support teams
- (2) As identified in the preceding section PeopleSoft provides a configurable application message feature to transmit data between PeopleSoft applications
- (3) Development for both systems often involves working with the native “language/ tool” (e.g. Java, SQR); PeopleSoft Application Designer provides a “paint-screen, map-data” approach to define online pages (then generates code)
- (4) PeopleSoft provides a trace tool to provide processing information to developers tasked with analyzing errors/problems; Query is used to diagnose incidents by allowing staff to access and analyze the specific data that is being processed
- (5) For data access PeopleSoft provides a number of online pages and a query tool for users to see/obtain data everywhere in the system; Kualo provides a document search feature for users to see/obtain data contained on an eDoc
- (5) For reporting, the University strategy and direction is to use BI; not to use the transactional system, on which the nVision report tool operates
- (6) For management of environments and updates/upgrades PeopleSoft provides a comparison tool (Change Impact Analyzer) that evaluates the code/objects of two environments and identifies differences
- SUMMARY: the number and capabilities of PeopleSoft tools have grown along with the applications and would provide the University with a bundled set that supports application implementation and maintenance. With Kualo the University needs to identify and select tools, especially to aid with software debugging and upgrade management

Technical Administration

Maintaining the system effectively requires visibility into system performance, status and trends. The maintenance is enhanced if the system or tools identify and present operational status and potential issues to staff for analysis, further research and action.

Administration Area	Kualo	PeopleSoft	Difference
Code and Environment management	Subversion Ant and build scripts	Change Assistant tool	← (1)
Performance and capacity	3 rd party tools	Environment Management Hub	← (2)



Administration Area	Kuali	PeopleSoft	Difference
monitoring		Performance Monitor	
Performance tuning	Analytical process requiring experienced staff	Analytical process requiring experienced staff	
System monitoring	3 rd party tools	Performance Monitor	← (3)
Batch process scheduling	Quartz scheduling 3 rd party tools	Process Scheduler 3 rd party tools	← (4)
Backup and recovery	3 rd party tools	3 rd party tools	
Data Archival	3 rd party tools	Data Archive Manager	← (5)

Key Points/Facts/Comments:

- **OVERALL:** Kuali relies more on external product/tool providers to enable the University to monitor and manage the technical infrastructure and the application software
- (1) PeopleSoft provides a utility to associate and package code/objects into a “project”, so that the project can be copied from one environment to another. The system retains project definitions and the history of the activities performed on a project
- (1) Effort to maintain the Kuali environments requires a system administrator to have some knowledge of Java (in addition to the server architecture) to accomplish environment updates efficiently
- (1) A PeopleSoft developer selects objects for inclusion in a project, the system administrator needs only to process the “project” by running a standard job (also the same tools and techniques employed for HCM and Student)
- (2, 3) PeopleSoft includes products for administrator use which show architecture performance data and provide visibility into the application software
- (4, 5) PeopleSoft includes mechanisms for data archival if and when needed by the University
- **SUMMARY:** the University maintains responsibility for obtaining system administration utilities for a potential Kuali implementation, finding mechanisms to monitor the architecture will not be difficult but there is a lack of products to provide visibility into the application software; PeopleSoft delivers utilities that can be used (and augmented/replaced when the University has time and need)



Other Technical Considerations

Overall Efficiency and Performance; Tuning

1. PeopleSoft architectures and financial applications have been operating with acceptable performance levels at a number of companies and institutions of comparable size to the University
2. The Quali architectures and financial applications are operating in few organizations, and performance levels are acceptable
3. Public knowledge, experience, skills, tricks and tips available for University leverage in creating and sustaining a high-performing Quali solution is more limited than PeopleSoft
4. Information gathered from peer institutions show great willingness to support one another and share information, but no other institution yet has the same KFS modules as Arizona

The University should maintain awareness of the new pending version of KFS, and a potential new version of Java, and include in project or support plans the activities to evaluate and assess changes that need to be made.



Implementation Experience and Outlook

Implementation Experience Overview

The purpose of this section is to compare the ongoing KFS implementation experience to what a PeopleSoft implementation would be from a duration, effort, and complexity point of view. To gather this information the review members met with the KFS implementation team and used modeling tools to determine the required effort level to implement PeopleSoft.

Implementation Phases

For comparison purposes the implementation experience for both applications will be discussed using the following process groups:

Process Groups	Description
Initiate	Tasks and processes that are performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
Plan & Design	Tasks and processes that are required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
Execute	Tasks and processes that are performed to complete the work defined in the project management plan to satisfy project specifications.
Monitoring and Controlling	Tasks and processes that are required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
Close	Those processes that are performed to finalize all activities across all Process Groups to formally close the project or phase.

Implementation Outlook Comparison

The following table details the high level processes and tasks that need to be completed under each phase of the project and depicts their current status. For the KFS implementation the statuses are classified as; Complete, In Process, or Not Started. For the PeopleSoft Implementation two additional statuses were added; Reuse which represents processes or tasks that were completed during the KFS implementation that can be reused for the PeopleSoft implementation and Modify which depicts tasks or processes that were completed during the KFS implementation that could be reused in a PeopleSoft implementation with modification.

Phase	Activity/Task	KFS	PeopleSoft
Initiate			
	Organize Project Team	Complete	Not Started
	Create Project Charter	Complete	Reuse

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Phase	Activity/Task	KFS	PeopleSoft
	Define Project Organization Structure & Governance	Complete	Reuse
	Train Team Members, Participants	Complete	Not Started
Plan & Design			
	Create Project Management Plan and WBS	Complete	Modify
	Create Process Design	Complete	Reuse
	Create Organization Design	Complete	Reuse
	Create Functional Design	Complete	Not Started
	Create Technical Design		
	Define Data Conversion/Migration Plan	Complete	Reuse
	Complete Technical Design of System Configuration	Complete	Not Started
	Complete Technical Design of Workflow, Roles & Routings	Complete	Not Started
	Complete Technical Design for Integrated Applications (3 rd Party)	In Process	Not Started
	Complete Technical Design for Customizations	Complete	Not Started
	Complete Technical Design for BI requirements	In Process	Modify
Execute			
	Create Detailed Use Cases/Test Cases	Complete	Modify
	Develop Code		
	Develop code related to System Configuration	Complete	Not Started
	Develop code related to Workflow, Roles and Routings.	Complete	Not Started
	Develop code related to integrated applications (3 rd Party)	In Process	Not Started
	Develop code related to Conversion	Complete	Not Started
	Develop code for Customization	In Process	Not Started
	Develop code for BI requirements	Not Started	Not Started
	Conduct Unit Tests	In Process	Not Started
	Conduct Integration Tests		
	Identify Integration Conditions	Complete	Modify
	Develop Integration Scripts	Complete	Modify
	Execute Integration Test 1	Complete	Not Started
	Execute Integration Test 2	Not Started	Not Started
	Conduct System Test		
	Identify System Test Conditions	Complete	Modify
	Develop System Test Scripts	Complete	Modify
	Execute System Test Cases	Not Started	Not Started
	Conduct Stress/Volume Test		
	Identify Stress Test Conditions	Not Started	Not Started
	Develop Stress Test Scripts	Not Started	Not Started
	Execute Stress Test Cases	Not Started	Not Started
	Train End-User		
	Identify necessary core competencies	Complete	Reuse
	Develop Team Curriculum, Training Plan	In Process	Not Started
	Develop Instructor-Led Training	Not Started	Not Started
	Develop Computer-Based Training	Not Started	Not Started
	Develop On-Line Help Materials for Application	Not Started	Not Started
	Conversion		



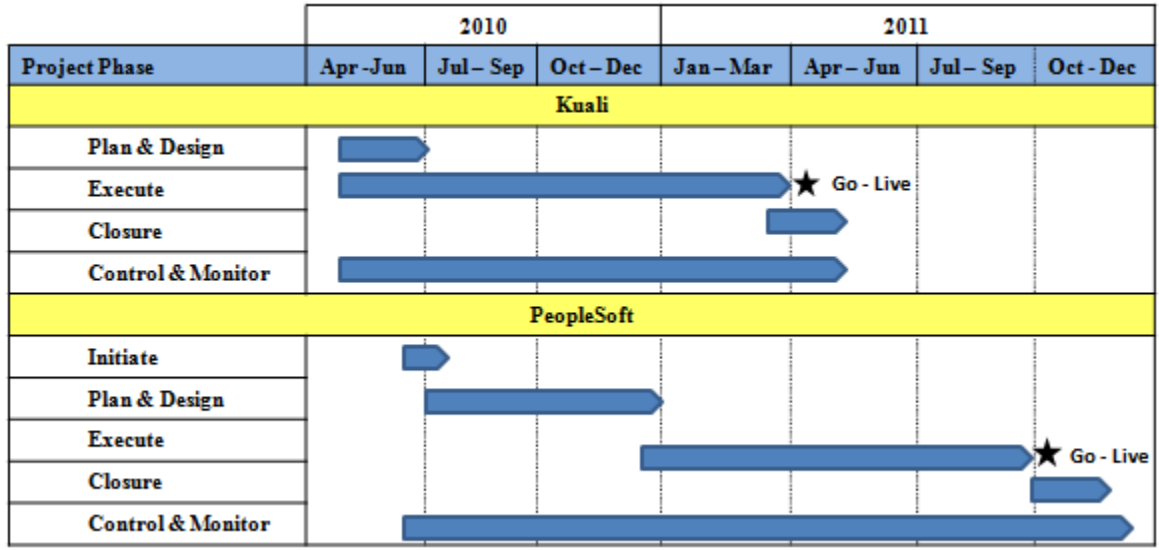
Phase	Activity/Task	KFS	PeopleSoft
	Update Conversion and Roll Out plan	Complete	Modify
	Develop Conversion Procedures	Complete	Not Started
	Execute Mock Conversion	Not Started	Not Started
	Move To Production (MTP) / Pilot Program for End-User Feedback		
	Develop detailed MTP / Pilot Program schedule	Not Started	Not Started
	Execute Mock MTP1	Not Started	Not Started
	Regression Test MTP, Execute MTP2	Not Started	Not Started
Control & Monitor			
	Project Control	In Process	Not Started
	Communications Management	In Process	Not Started
	Monitor Business Success Metrics	In Process	Not Started
	Manage Activities of Team	In Process	Not Started
Close			
	Update Help Desk Services	Not Started	Not Started
	Reassign Resources	Not Started	Not Started
	Provide Production Support	Not Started	Not Started
	Manage Knowledge Capital	Not Started	Not Started

Key Points/Facts/Comments:

- The KFS implementation is currently at an advanced state with the majority of the application having been designed, configured, developed, and having undergone the first round of integration testing.
- A PeopleSoft implementation could leverage a certain amount of work that has been done as part of KFS implementation. These areas include project organization, project governance, documentation of current-state processes, business requirements, and test scenarios and cases. The project team will also have the ability to leverage the “lessons learned” during the KFS implementation to improve on the efficiency and success of the project.

Estimated Implementation Timeline

The timeline below illustrates the estimated time to complete the KFS implementation based on the University’s historical KFS implementation performance and what is known to be left to complete. The PeopleSoft timeline was developed by leveraging the knowledge (e.g. integration points, conversion requirements, reporting requirements, and required modifications) acquired during the ongoing KFS implementation and through an implementation estimate that was developed by Navigator Management Partners based on their experience implementing the PeopleSoft application. For this illustration, the start of the PeopleSoft implementation was pushed back to June in order to account for the time necessary to transition the implementation from KFS to PeopleSoft.



Estimated Implementation Effort

The table below summarizes both the estimated internal and external effort required to complete the KFS implementation and/or perform a PeopleSoft Financials implementation under the timeline detailed in the previous section. This table was developed using the same inputs that were used to develop the implementation timeline previously illustrated.



	KFS		PeopleSoft	
	Hours	Est. FTE's	Hours	Est. FTE's
Total Estimated Effort to Complete	50,981	30	69,824	33
Implementation Team - Internal	30,550	19	30,227	16
Program Director	2,314	1	3,255	1
Technical Lead & Developers	6,127	5	7,427	5
Business System Analysts	22,109	13	19,545	10
Implementation Team - External	20,431	11	39,597	17
Project Manager	2,133	1	3,255	1
Technical Lead & Developers	7,334	4	12,863	5
Consultants / Analysts	6,480	3	18,140	8
Change/Training Lead	1,350	1	1,350	1
Reporting Lead	1,350	1	1,350	1
Test Lead	1,784	1	2,639	1

Key Points/Facts/Comments:

PeopleSoft Assumptions:

- The PeopleSoft implementation would rely on the services of an implementation partner utilizing a typical PeopleSoft implementation approach and methodology. This approach would emphasize the use of external consultants to lead the design, configuration, and testing of the application.
- Number of Core Processes being addressed:
 - GL, Financial Processing, COA, Labor Distribution, and Effort Certification – 67
 - Purchasing and e-Procurement - 23



- Accounts Payable and Travel – 28
- Asset Management – 17
- Contracts, Grants, Projects – 5
- Development of 54 reports; 6 per module being implemented
- Development 45 queries; 5 per module being implemented
- Development of 27 integration points; consistent with KFS implementation
- Development of 14 conversion concepts; consistent with KFS implementation
- 100 Modifications; 10 per module being implemented accounting for necessary workflow development plus 10 additional modifications to develop the necessary effort reporting functionality.

Key Assumptions Kual:

- The methodology and approach that has been used throughout the KFS implementation project will be continued. However, the following resources have been added to the current team in order to provide the additional support that would be needed to finish the project:
 - 1 Reporting Lead
 - 1 Training Lead
 - 3 Consultants (Financial Processing, AP, Contracts & Grants/AR/Effort Cert) to assist the University’s BSA’s.
 - 2 Consultant Developers to assist with ongoing bug fixes and finish integration points and customizations.
- The effort assumes that the trend of bugs found level off and that the team can address them in during a period of time not to impact the project schedule.
- No new requirements and/or customization requests are identified during system testing.

Implementation Considerations

Implementation Consideration	Kuali	PeopleSoft	Difference
Schedule	It is estimated that the remaining tasks and activities related to the KFS implementation will require an additional 12 months to complete.	It is estimated that the PeopleSoft implementation will take approximately 18 months to complete.	← (1)
Standardization of Business Processes	The KFS implementation team has already gone through the exercise of mapping the University’s business process to KFS.	In order to properly implement the application the University will need to standardize and modify its business processes so that they that better match with PeopleSoft	← (2)
Implementation Methodologies	The Kual project team utilized a generic ERP implementation methodology to govern project	There are many common PeopleSoft implementation methodologies that have been developed by Oracle and	← (3)



Implementation Consideration	Kuali	PeopleSoft	Difference
	activities and phases. The methodology has been adjusted throughout the project in order to address the rigors of the project and the Kuali toolset.	large consulting companies. The phases and tasks corresponding to these methodologies are widely understood, accepted, and practiced and can help guide the implementation's execution.	
Training/On Boarding	The availability of Kuali training is limited, necessitating the internal development of resources. It is estimated that the training and development of a Kuali resource will take approximately 3 to 6 months before they become fully acclimated to the application.	PeopleSoft training is widely available and can be conducted, on or off-site, through electronic media, or in virtual classrooms via the web.	← (4)
Testing	Testing for the KFS application will need to be more extensive as compared to PeopleSoft application in order to validate that all delivered functionality is working as designed.	.	← (5)

Key Points/Facts/Comments:

- (1) The estimated schedule to complete the KFS implementation is more predictable than the estimated PeopleSoft implementation schedule due to the progress that has been made to date on the KFS implementation and what is currently known about the requirements to complete the implementation.
- (2) The University has already gone through a process mapping exercise and has configured the KFS application to match those processes. A shift to PeopleSoft would require the University to reevaluate their processes and adjust them to fully leverage the PeopleSoft application and minimize customizations. This change will be more pronounced than what has been done to date with KFS due to the architecture and embedded processes within PeopleSoft. The University will need to devote more time to organizational change management and training in order to have a successful transition to PeopleSoft.
- (3) PeopleSoft Financials has been implemented in over 100 Higher Education institutions. The methodology to implement the application is widely understood and there are many partners and peer institutions the University could leverage for guidance. In addition, the PeopleSoft application itself comes embedded with more robust implementation/configuration documentation and tools such as Setup Manager that clearly articulate what is required to be configured in order to implement a particular set of functionality. The Kuali implementation methodology and procedures are still evolving.



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- (4) The ability to train team resources quickly and have them be able to contribute to the implementation effort will help the University mitigate resource risks within the implementation team. The biggest difference between Kuali and PeopleSoft in this respect is that Kuali resources will need to be developed internally, whereas a PeopleSoft resource could be acquired through an external labor pool and/or trained through the wide variety of training programs available for PeopleSoft.
 - (5) The Kuali application is still evolving and being developed as compared to the PeopleSoft application which is now stable and has been vetted over a sixteen year time span. As such, the core functionality within the application is very sound and does not require the degree of testing that is required for Kuali. KFS testing to date has shown that there is still a fair amount of “bugs” which need to be addressed, increasing the length and effort levels required to complete the testing cycles.

Implementation Experience Conclusions

At a basic level implementing either application is a big undertaking and would require the University to go through the same project phases and tasks. There has been a lot of knowledge gained throughout the ongoing KFS implementation from both a Kuali and University of Arizona perspective that can be used to complete the KFS implementation or leveraged through a PeopleSoft Financials implementation. The biggest difference is that Kuali is an evolving application and as such more complex to implement due to unknown variables. The KFS project team will need to be more skilled and tactical than a PeopleSoft implementation team in order to be able understand the University’s requirements and map them to an application that is still changing, has limited configuration documentation, and has not been thoroughly tested. Each phase of the KFS implementation will take a little longer to complete and require more thorough testing as compared to a PeopleSoft implementation. The biggest advantage in continuing the KFS implementation is all the knowledge that has been acquired to date. There is a clearer picture of what is left to be done and the project team has already gone through a fair amount of maturation.



Application Support

Application Support Overview

Members of the Review Team performed research concerning how the applications would need to be supported by a combination of the software provider, internal resources, and external resources. The support areas include on-going maintenance (application of fixes and constituent-requested enhancements) and the help desk, as well as future version upgrades.

- Gartner Assessment/Comments: “Through 2013, 50% of mainstream IT projects using OSS will not achieve cost savings over closed-source alternatives. Some of the myths of open-source economic advantages will fall away as many enterprises realize that they have simply shifted costs away from one area to another (for example, commercial operation support to internal employee support). Do not reject open source on the sole basis of cost, but look at longer strategic advantages related to open innovation driven by broad and robust communities.” [“**Predicts 2009: The Evolving Open-Source Software Model**”; **Gartner December 2008**]
- “Although some institutions make best-of-breed selections of individual core applications, the integrated suite represents the choice of the thousands of higher education customers represented by the vendors included in this Magic Quadrant. The integrated suite continues to show value for the ability to leverage product development, shared "best practices," common database and data definitions, packaged integration, technology, and skill sets. These core administrative applications represent the largest IT expenditure in an institution's budget.” [“**Magic Quadrant for Higher Education Administrative Suites**”; **Gartner October 2008**]

Software Provider Higher Education Presence and Direction

Kuali Foundation and Financial System

- Gartner Assessment/Comments: “Open-source applications for the public sector exist on a small but growing scale. The impetus for speeding up their development comes from the need to replace legacy applications, combined with the reluctance of being locked in to application vendors. This is leading to numerous initiatives to pool resources across different agencies and jurisdictions. Examples include ... in the Higher Education sector (Sakai and Kuali).” An entity should consider OSS “when there is a well-identified and sustainable community of government users and developers who all have a clear business case for participation and support.” The maturity level is ‘emerging’ (5-10 years to go). [“**Hype Cycle for Open-Source Software, 2009**”; **Gartner July 2009**]
- The KFS design is targeted specifically to Higher Education; enhancements and changes are coming from and directed toward Higher Education institutions solely.



Oracle/PeopleSoft and PeopleSoft Financial System

- Gartner Assessment/Comments: “Datatel, Oracle and SunGard Higher Education (Banner) continue to be placed in the Leaders quadrant. Collectively, their suites represent approximately two-thirds of the institutions running an integrated administrative suite (HR, finance and SIS), the majority of which are in North America. All three providers have moved higher and farther to the right on the Magic Quadrant, which reflects continued execution on vision in the increasingly comprehensive suites.” [“**Magic Quadrant for Higher Education Administrative Suites**”; **Gartner October 2008**]
- “The integrated suite for Higher Education has taken on a decidedly customer focus, which is starting to pay off in the marketplace. Moreover, current customers are beginning to see greater cohesion in the vision for the suite.” [“**Magic Quadrant for Higher Education Administrative Suites**”; **Gartner October 2008**]
- Higher Education is not the only industry for the product; while some Higher Education enhancements are made regularly, these candidates vie with requests from other customers and industries

On-Going Maintenance and Support

Application Provider Support

The software provider will supply the University with application support to cover delivered product fixes, enhancements and upgrades.

Support Area	Kuali	PeopleSoft	Difference
“Bug” fixes	Provided independently or with Maintenance Release Delivered by Foundation Delivered by community Delivered by U of A	Provided independently or with Bundle/Maintenance Pack Delivered via web site My Oracle Support (that University monitors) <i>See also “Responsiveness” below</i>	← (1)
Enhancements	Maintenance release	Typical availability: Bundles every 6-12 weeks Maintenance Pack quarterly Minor releases every 12-18 months	← (2)
New Releases	Target availability: Major version annually	Typical availability: Minor releases every 12-18 months Major releases every 2-4 years; include a new Tools release	
Federal Compliance	Given top priority and provided as patch or in maintenance or major release	All Federal regulations are provided via a patch or bundle that is downloaded from My Oracle Support	
State of Arizona Compliance	rSmart will collaborate; Self-support schools do their own	State 1099 changes are provided via a patch or bundle that is downloaded from My Oracle Support	
Support Process	Customers log an incident with the Foundation via JIRA, noting that it is defect or an enhancement request.	Customers log a Service Request with My Oracle Support noting that it is defect or an enhancement request	



Support Area	Kuali	PeopleSoft	Difference
	Enhancement requests are reviewed and evaluated within the community for inclusion in a future update or release	Enhancement requests are sent to Oracle Development for review and evaluation for inclusion in a future update or release	
Responsiveness	Blockers are worked immediately Blockers: 48 hour target Critical: 2 week target	Severity 1 issues worked around-the-clock (others worked during business hours) until solution or workaround found	
Philosophy for Older Releases	Likely policy to support current release and “one back”	<u>Extended Support</u> provides an extra three years of support for specific Oracle releases for an additional fee <u>Sustaining Support</u> provides technical support for as long as you operate your systems (less critical patch and tax, legal and regulatory updates - the University would need to develop these)	← (3)

Bug Fixes for the PeopleSoft products are provided as follows:

Maintenance Type	Frequency	Contents
Patch/Fix	• As needed	• Single fix • Critical fixes
Application Bundle	• 6 weeks >30 incidents • 12 weeks < 30 incidents	• Collection of fixes for one functional area (e.g. Product) • Posted critical (P1) and urgent (P2) incidents
Maintenance Pack	• Quarterly (dependent on defect volume)	• All posted maintenance (bundles and individual fixes) • Delta and cumulative content
Service Pack	• 1 – 2 years	• All code changes made after GA release date • Cumulative at database level

Key Points/Facts/Comments:

- **OVERALL:** The support viewpoints of Kuali and PeopleSoft are not comparable at this time. The Kuali Foundation provides no commitment or service level agreement for product support and may not have an intention to do so, relying instead on partnership, collaboration, and self-sufficiency of institutions. The PeopleSoft business model includes, advertises and measures support provision as a feature and benefit of maintenance contracts.
- **OVERALL for Fixes:** From both organizations the University should expect critical fixes to be supplied by the software provider quickly. Both organizations also provide collections of fixes. For both products it is possible that the University would need to design and implement a local fix independently if the providers cannot or will not provide a resolution on an acceptable schedule.
- **OVERALL for Enhancements:** Both organizations seem to handle enhancements by bundling and releasing them in some form of package. The University can choose whether and when to implement the package.



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- OVERALL regarding Delivery Schedule: The Quali maintenance policies and schedules are not yet formalized to the same extent as for PeopleSoft
 - (1) Quali fixes can come from the Foundation or other institutions or support companies/consulting groups; University staff would solicit the Foundation and then potentially the Community for a fix; fixes made by institutions are contributed to the Foundation for consideration to be included in a future release. PeopleSoft fixes would come from Oracle.
 - (2) PeopleSoft requires that customers apply maintenance packs in consecutive order because the implementation of one depends on changes that were made in previous packs.
 - (2) The University will need to work with both providers to understand upcoming “package” deliveries and make plans based on an analysis of the included features
 - (3) It is not yet clear whether and how the Foundation will provide support for previous versions.
 - SUMMARY: A PeopleSoft implementation provides known support processes and will require the University to be committed to plan and execute regular maintenance pack updates so that ongoing support can be provided most efficiently. A Quali implementation will likely not cause or force regular application updates but presents support uncertainty and requires a higher level of self-sufficiency – institutions need to be prepared to maintain the product on their own – as the Foundation policies and processes evolve and solidify

Support Model – Internal Resources

Regardless of the software provider support, the University will need on-site resources devoted to application maintenance and enhancement; to sustain the production environments and customizations and to implement new features and capabilities.

Also, the University will require resources to maintain the system architecture. For each alternative it is important to estimate the number of people (and the requisite skills of the people) required to keep the technology up, address the behavioral issues/problems that arise, and enhance it to support growing demand.

- Gartner Assessment/Comments: “First-year costs equal 50% more than pre-implementation, while second year costs are about 35% more; from that point onward it will require about 25% more (This assumes that no major modifications or new modules are added...)” [“Steady-State ERP Costs for Higher Education”; Gartner June 2008]
- “Open-source solutions for financials are at an early stage, and they should be monitored as a possible fit only for institutions that are capable of supporting in-house application development as well as have no pressing need to change their solutions.” [“Hype Cycle for Education 2009”; Gartner, July 2009]



Technical Support Resources for Financial System – Potential Net Change

Given that the University has PeopleSoft applications in production, there will be some leverage of technical people already deployed to support them. Overall, a Kualo implementation will cause the University to increase the application systems support staff. (the University is committed to implementing Kualo Coeus, which runs the same technology on the same platform as Kualo Financials, so there is potential for personnel sharing between these applications, albeit KC is a smaller impact product than KFS). NOTE: the level of needed technical support increases further for both KFS and PeopleSoft if the University adopts a high-level user “service agreement”, i.e. An SLA that calls for rapid, continuous implementation of enhancements and changes in addition to fixes.

Roles	Kualo (FTE)	PeopleSoft (FTE)	Comment
Development Lead	1	0	Manages work assignments and performance; supports staff based on superior knowledge/skills; likely that the existing PeopleSoft lead can also support a PeopleSoft finance application
Analyst/Designer	1	1	Each application will need resources who understand the design features and capabilities of the product and are strong developers
Developer	2	0	Different skills are needed for Kualo/Java versus PeopleSoft; likely that “some part(s)” of existing PeopleSoft developer(s) can also support a finance application
DBA	0	0	No net change anticipated since DBMS is the same for both
System Administration	0	0	System Administration in the Kualo environment needs some skills of a Java developer. Most likely that existing system administrators can also support a finance application.
Security Administration	0	0	Most likely that PeopleSoft security administrator already in place can also support a finance application
TOTALS	4	1	



Functional Resources for Financial System – Potential Net Change

Regardless of the software chosen, the University will need functional resources devoted to user support and requirements definition, design, and testing of system fixes, changes and enhancements. While the needed application knowledge would be different, the numbers should be materially equal.

Roles	Kuali (FTE)	PeopleSoft (FTE)	Comment
Finance			Includes GL, Assets, AP
Lead/Specialist/SME	.25	.25	After stabilization, part-time role based on user call frequency and number of change requests
Procurement			
Lead/Specialist/SME	.25	.25	After stabilization, part-time role based on user call frequency and number of change requests
Grants and Contracts			
Lead/Specialist/SME	.25	.25	After stabilization, part-time role based on user call frequency and number of change requests
Budget			
Lead/Specialist/SME	.1	.1	After stabilization, part-time role based on user call frequency and number of change requests

Technical Support Resources for Business Intelligence – Potential Net Change

Under the University direction to use a single business intelligence/reporting solution for Human Resources, Student Administration, and Finance, the use of the Kuali or the PeopleSoft financials application software will increase the Business Intelligence support team composition.

Roles	Kuali (FTE)	PeopleSoft (FTE)	Comment
Development Lead	0	0	Manages work assignments and performance; supports staff based on superior knowledge/skills; likely that existing lead can also support finance
Developer	1	1	Likely that “some part(s)” of existing BI developer(s) can also support a finance application
DBA	0	0	Most likely that DBA already in place can also support the addition of finance
System Administration	0	0	Most likely that system administrator already in place can also support a finance segment
Security Administration	0	0	Most likely that security administrator already in place can also support finance users



Support Model – Key Resource Availability

The University will need resources under each solution; it is important to consider the ease of finding needed people with the appropriate skills. Kualu will present a challenge.

Java is one of the skills highly in demand currently and for the next few years, not unlike the 2-3 year demand peak for PeopleSoft skills about 10 years ago. The demand-supply imbalance will often cause employers to pay a premium until balance is achieved.

Industry Assessment/Comments:

- "...programming/application development is the skill set that's most in demand, by far, according to Computerworld's survey. Specifically, companies will look for developers with knowledge of .Net, Java, Web development, open source and portal technologies..." ["Six Hottest IT Skills for 2010"; Computerworld, December 2009]
- "...skilled Java developers have remained among the industry's hottest properties through the recession ... The problem with Java is the breadth of applications it is used for and the corresponding wealth of tool and platform choices. This can make it challenging to find developers with just the right skills to fit your company. You may have to pay a premium..." ["Hot Jobs: Java Developer"; CIO Magazine, September 2009]

Per a peer institution that is also experiencing difficulties finding people, a Java developer is not a Kualu developer. Their experience, and that of the Kualu Foundation and the Mosaic team, is that it takes 3-6 months for a developer to get up-to-speed for efficient KFS implementation and maintenance. The challenge for the University is finding and retaining enough competent Java-Kualu developers, at an acceptable cost, for the next few years.

Network of support professionals

- Kualu: University technical and functional support staff need to solicit assistance from a virtual community; there is not one place to go for help with issues that arise during implementation and operations; a Kualu knowledge base is in the process of being developed but is not yet built
- PeopleSoft: University support staff can research the online knowledge base, contact the vendor, and solicit aid from the User Group
- Kualu consultants: a limited number of consulting companies are currently members of the affiliate program and include: rSmart, Huron Consulting, Vivantech
- PeopleSoft consultants: aside from the Oracle Consulting division, a large number of consulting companies are Oracle partners and include: Accenture, Deloitte, IBM



Support Model – Upgrades

Each of the software products will most likely be upgraded in the future. While it is difficult at this time to estimate with precision the upgrade effort or time requirements, certain facts and considerations are important for this assessment and the University decision.

Kuali	PeopleSoft
<ul style="list-style-type: none"> ▪ Of the current limited customer base, CSU has accomplished an upgrade in the test environment 	<ul style="list-style-type: none"> ▪ Products have been upgraded by a large number of customers
<ul style="list-style-type: none"> ▪ Kuali Foundation is in process of developing methods and tools to facilitate a version upgrade 	<ul style="list-style-type: none"> ▪ PeopleSoft provides a path, methodology and tools to help identify and understand the differences between the production version and the new release, and the need for potential re-customization
<ul style="list-style-type: none"> ▪ Kuali Foundation is in process of developing tools and scripts to facilitate a version upgrade; in interim, project teams use other tools to transfer production configuration and data from the production version and the new release 	<ul style="list-style-type: none"> ▪ PeopleSoft offers services of an upgrade lab and/or upgrade scripts to help transfer production configuration and data from the production version and the new release (using the upgrade lab would involve a separate cost)
<ul style="list-style-type: none"> ▪ Kuali Foundation is in process of developing methods and tools to facilitate a version upgrade 	<ul style="list-style-type: none"> ▪ Updates to the underlying language and tools (e.g. SQR, PeopleTools) are bundled with the new product, and the comparison tools are able to read application feature differences across tool versions

- For both products: An upgrade initiative generally follows the development life cycle phases to include design, development, testing and data conversion as well as organizational change management, communications and training effort
- PeopleSoft upgrades often require 40-60% of the original design-build-test efforts to analyze, adjust, test and implement the desired go-forward customizations
- Kuali upgrades are not numerous enough at this time to provide a basis of successful experience upon which to estimate the potential work for the University
- Kuali upgrade and COEUS: Kuali COEUS will be available as version 4, designed to integrate with KFS version 4; the University plans to implement COEUS. These facts indicate that KFS must be upgraded to version 4 at some point to coordinate with the COEUS project (whose dates are unknown at this time).
- SUMMARY: With a KFS implementation the University should try to drive the completion of tools and scripts to facilitate an upgrade

Help Desk Approach

Effective system use and maintenance is enhanced by using a support “ownership” group that

- Works within a help desk structure to support users and
- Controls the introduction of fixes and new features.

The University help desk function now supports the new Mosaic systems (HCM, Student, and Business Intelligence). Previous to Mosaic the University help desk supported HCM and Student legacy applications; therefore the introduction of newer technology in these areas did not



increase the help desk responsibilities. The help desk does not support the current FRS system, but will be asked to support the new financial system (Kuali or PeopleSoft), increasing the overall responsibilities and workload. This section identifies the potential net change (increase) for the help desk.

The descriptions in the following table explain the organization and procedures/relationships between the groups that support the systems.

Roles	Kuali (FTE)	PeopleSoft (FTE)	Comment
Tier 1			First point of contact; answers phone/email; resolves basic problems that can be documented via a checklist; also can confirm that the problem is user error or data error and often resolves; refers other problems to Tier 2 specialist
Lead	0	0	Likely leverage of existing Lead(s) for administration and management
Specialist	2	2	After stabilization period.
Tier 2			Functional/application specialist or “super-user” who can confirm that the problem is configuration error or software issue; resolves configuration issues; refers software issues to the “support ownership group”; works with Tier 3 to test changes & approves the move to production; these are the “functional support resources” shown above
Finance (incl. Assets, AP)	.2	.2	After stabilization likely part-time demand on 2-3 identified SMEs
Grants	.2	.2	After stabilization likely part-time demand on 2-3 identified SMEs
Procurement	.2	.2	After stabilization likely part-time demand on 2-3 identified SMEs
Support Ownership Group (maybe the existing “Functional Council”)			Key functional (& technical) staff charged with controlling the maintenance: prioritizes requested fixes & enhancements, assigns development and testing, coordinates implementation, communicates
Lead	.1	.1	Part-time role; e.g. meeting every 2 weeks
Finance owner/delegate	.1	.1	Part-time role; e.g. meeting every 2 weeks
Grants owner/delegate	.1	.1	Part-time role; e.g. meeting every 2 weeks
Procurement owner/delegate	.1	.1	Part-time role; e.g. meeting every 2 weeks
Tech/development delegate	.1	.1	Part-time role; e.g. meeting every 2 weeks
Tier 3			Internal developers assigned fixes & enhancements; these are the “technical support resources” shown above; identify if a software issue is a “defect” with the delivered product, in which case they refer it and work it with Tier 4; otherwise they design/build/test the fix or enhancement as assigned
Internal technical support staff			See “Support Model – Internal Resources” section



Tier 4			Software provider staff who provide support and resolution of delivered product defects
Contracted support staff			Should not be a University concern



Potential Estimated Costs

	PeopleSoft FMS OneTime Implementation	PeopleSoft FMS Perpetuity Annual Support	Kuali KFS OneTime Implementation	Kuali KFS Perpetuity Annual Support
SHARED ALLOCATION Costs				
<u>Software & Hardware Costs</u>				
Shared Software - Licensing / Maintenance (Allocation)	\$ 278,725	\$ 278,725	\$ 278,725	\$ 278,725
Hardware - Purchase / Support (Allocation)	\$ -	\$ -	\$ -	\$ -
<u>Personnel Costs</u>				
Business Intelligence (Allocation)	\$ 738,183	\$ 197,920	\$ 738,183	\$ 197,920
Overall Mosaic Management (Allocation)	\$ 412,441	\$ 115,677	\$ 412,441	\$ 115,677
SHARED Subtotal	\$ 1,429,348	\$ 592,322	\$ 1,429,348	\$ 592,322
FINANCIAL SYSTEM Costs				
<u>Application Software Costs</u>				
Software Initial Licensing / Maintenance	\$ 1,516,021	\$ 273,381	\$ 159,500	\$ 159,500
KFS Anticipated rSmart Maintenance/Support	\$ -	\$ -	\$ 50,000	\$ 50,000
<u>Personnel Costs</u>				
Implementation Management (Initiative Director)	\$ 60,000	\$ -	\$ 60,000	\$ -
Functional Work - UA Staff	\$ 878,233	\$ 348,589	\$ 945,571	\$ 348,589
Functional Work - Consulting (assumption 2 below)	\$ 3,215,850	\$ -	\$ 1,321,788	\$ -
Technical Work - UA Staff (assumption 3 and 4 below)	\$ 137,750	\$ 735,965	\$ 67,667	\$ 1,119,965
Technical Work - Consulting (assumption 2 below)	\$ 2,393,810	\$ -	\$ 1,514,705	\$ -
FINANCIAL SYSTEM Costs Subtotal	\$ 8,201,664	\$ 1,357,935	\$ 4,119,230	\$ 1,678,054
RISK CONTINGENCY **	\$ -	\$ -	\$ -	\$ -
Totals	\$ 9,631,013	\$ 1,950,256	\$ 5,548,579	\$ 2,270,376

**** NOTE**

FSRT believes that there is a risk factor associated with the implementation and maintenance of each, and that the risk of KFS is higher than the risk of PS. FSRT cannot yet place a dollar value on these risks.

Assumptions:

- 1) PS FMS would be implemented using a partner consulting organization in 15-18 months
- 2) PS FMS and KFS would add consultants to the implementation project
- 3) Need more technicians w/KFS than w/PS to maintain the base software itself
- 4) Need additional environment team members w/KFS above & beyond base PS support personnel
- 5) KFS would go-live April 2011 (~1 year from now)



Risks

The factors affecting risk related to proprietary solutions also apply to open-source. The foundation of the open-source model differs from closed-source in terms of licensing and the practices for development, delivery and support of the solution. This section identifies the key unique risks that would apply to a Kuali or a PeopleSoft solution.

Overall Risks

Kuali Foundation and Financial System:

- Aspects of the Foundation and community may stagnate or degrade
 - “When one or more of these elements – maturity, community and governance – fall short, the resulting risk factors increase substantially” [“**Common Questions About OSS From IT Managers**”; Gartner June 2009]
- The University may be on a path toward a custom solution for which the University is responsible (alone or with/through some commercial enterprise or other University partners) for its compliance, effectiveness and upkeep over time.
 - “Open-source adopters have the option to acquire and operate software independent of third-party commercial contracts; however, when removing the contract and service level agreement (SLA) that accompanies these contracts, OSS also passes responsibility regarding technical and legal risks directly to the licensee.” [“**Common Questions About OSS From IT Managers**”; Gartner June 2009]
- Accuracy or availability may be impacted due to the relative newness of KFS, which raises risk of “bugs” in the software.
- Performance may be impacted due to present inexperience with the technology stack monitoring and performance tuning tools and techniques.
- Due to newness of Kuali application there is a limited resource pool of qualified Kuali developers and analysts which could cause support costs to increase due to consultant involvement for maintenance.

Oracle/PeopleSoft and PeopleSoft Financial System:

- PeopleSoft design is flexible but less specific to higher education. For the University, whose members and users may not readily embrace change, there is risk of an “inadequate” implementation. This can likely be defined in terms such as a need to customize the application and/or invest in change management activities to facilitate user acceptance and minimize errors and inefficiencies.



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- The PeopleSoft solution may not be available on an acceptable schedule due to prerequisite time needed for preparation and start-up
 - The PeopleSoft solution may not address all of the National Science Foundation audit findings related to the University's compliance with effort reporting and cost sharing requirements and may not fulfill the corrective action plan as outlined in the University's response to the audit.
 - Higher Education-specific enhancements may not be addressed in the same priority as other segments served by PeopleSoft.
 - College's and Department's "shadow" accounting systems will not be eliminated to the same extent as a Kuali implementation without PeopleSoft customization.