

The Kualī Financial System:

Community-Developed Software for Education

May 2010



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Preface

In late 2009, the Kualu community released version 3.0 of its Kualu Financial System—the Kualu Foundation's* first open source software solution for higher education. Since then, interest in the Kualu Financial System, the Foundation itself, and the Foundation's other development projects has grown at a tremendous rate.

Less than one year ago, three North American institutions went into production with the Kualu Financial System. Now at least nine more colleges and universities are implementing the system. Institutions of all types and sizes—from research-intensive land grant institutions to small private colleges to community colleges—are finding that the Kualu Financial System is the best solution for them.

As interest in the system has mounted, CIOs, CFOs, controllers, and departmental managers have sought information about the Kualu Financial System and what they can expect from using it on their campuses. This whitepaper addresses many of the questions they have raised—questions that both leaders and staff at other institutions are likely to be asking as well. Specifically, this paper provides:

- An overview of key design features that are uniquely suited to higher education.
- More information about Kualu Financial System functions and features specific to college and university requirements for: procurement, vendor management, payables, accounts receivable, travel and expense, chart of accounts, effort reporting and certification, capital assets management, encumbrances and commitments, grants and contracts, workflow for routing and approval of transactions, and endowments.
- High-level information on system architecture and tools. This section covers integration between Kualu Financial System modules; integration with external applications and enterprise performance management systems; technical tools used for integration,

* For information on the Kualu Foundation, its products, and its ongoing development projects, see Appendix A.

development, reporting, data import/export, etc.; technical administration; and other technical considerations.

- Options for providing/obtaining support and the approximate number of support resources required in both technical and functional areas.
- Implementation and support tips from institutions that are using the Kualu Financial System today.
- Two appendices—one providing additional information on Kualu and rSmart and the other providing Kualu Financial System references.

Acknowledgements

This whitepaper is brought to you by [rSmart](#), one of the founders of the Kualu community. As with most activities of this community, the development of this paper was a collaborative effort. Contributors include the following subject matter and technical experts:

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We also offer special thanks to the members of the Kualii Financial System Project Board of Directors:

- Bruce Alexander, Director of Enterprise Business Systems Projects, Michigan State University
- J. Michael Allred, Associate Vice Chancellor Finance/Controller, University of California, Davis
- Christopher D. Coppola, Chief Executive Officer, rSmart
- Troy Fluharty, University Controller/Director of Business and Financial Services, University of Colorado
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Their support of the development of this paper has been invaluable.

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Kuali Financial System: Designed for Higher Education

The Kuali Financial System (KFS) was designed by a group of educational institutions specifically for universities and colleges. The system:

- Allows institutions to set up different workflows and business rules for different fund groups.
- Employs attributes (for example, higher education function codes, fund groups, and restriction statuses) specific to higher education reporting requirements.
- Handles encumbrances, cost sharing, endowments and effort certification.

The Kuali Financial System is designed to support the distributed nature of universities and colleges. As a web-based system, it allows all authorized users easy, online access, regardless of their location. Across the institution, these users—many of whom may have little accounting knowledge—work in customized electronic forms (called electronic documents or e-docs) to enter different types of business transactions.

As each e-doc is submitted, the system routes it for approval and processing based on business rules established by the institution and the specific organization(s) involved. This customized routing supports both the university's internal controls and each unit's needs to see specific transactions. The system also stores the transaction data on line.

Because different institutions have different needs, parameter tables in the system enable each college and university to set up institution-specific business rules. These rules may be based on a wide variety of criteria, such as type of transaction, object code, fund group, and dollar amount.

The three subsections below highlight additional features of the system that make it especially well suited for use in higher education.

Key Features for Budget and Finance

Higher education accounting requires that income/revenues and expenses/expenditures be grouped by sources of funds. The source of funds indicates the revenues/expenditures that are allowed on a particular account. Reporting requirements and approvals differ for each fund

source. For example, charges to contracts and grants may need to route to the office of contracts and grants administration.

The Kualu Financial System allows institutions to organize funding sources into fund groups and sub-funds and then allows the institution to set up business rules and workflow appropriate to each. So, for example, this approach allows contracts and grants fund groups to be subject to the specific rules of their sponsors.

In higher education, budgets are established for accounts. Depending on the fund source, budgets must not be routinely transferred between fund groups (such as, general funds and restricted funds) or between sub-funds within a fund group.

The Kualu Financial System meets these requirements by using a budget adjustment restriction code as an attribute of the fund group and sub-fund groups. The Budget Adjustment e-doc uses this attribute to restrict budget adjustments by fund and sub-fund as appropriate.

Typically, sources of funds carry restrictions. In the Kualu Financial System, restrictions are specified for each sub-fund by setting the "restricted" status code. Then, when a user creates a new account and associates it with the restricted sub-fund, the restricted status code is automatically applied to the account.

Some fund sources (for example, loan funds) do not permit salaries or wages to be posted to them. In the Kualu Financial System, this restriction may be set as an attribute of the sub-fund.

Departments and other units throughout an institution require up-to-date account balances to facilitate sound decision-making. To meet this requirement, all Kualu Financial System financial transactions create pending general ledger entries, and these entries are reflected in the system's online balance inquiry screens. These screens also provide a drill-down feature that facilitates analysis and problem solving. By clicking links on the screen, users can drill down from a very high level to the level of the individual transaction. Users may display all information for this transaction, including a route log that shows all workflow activity for it.

Universities budget by position as well as by account code and object code. To facilitate budgeting by position, the Kualu Financial System starts with a base budget and position funding that may be updated daily or updated upon request via a payroll synchronization feature. The system

also provides a push-down/pull-up feature that facilitates budgeting *at any level* in the organization. Salary setting functionality allows for the setting of salaries by position or incumbent. (Note: When a particular Budget Construction e-doc is being edited by another user, it is locked and cannot be pulled up or pushed down. It can be unlocked, however, by a central administration user.)

The Kualu Financial System's labor ledger helps institutions meet the federal requirement that the office of contracts and grants administration confirm effort expended on grants and contracts. When salary expense transfers are created, the system creates two transaction types to facilitate *both* reporting of effort in the period in which it was expended *and* reporting of expenditures in the period in which the transactions occurred. The system's Labor Ledger View balance inquiry also supports both the actual expenditure view and the effort expended view.

Equipment purchases are another area in which higher education has special requirements. The Kualu Financial System accommodates these needs by booking equipment purchases to an institutional account when they are expensed. For each equipment purchase, the department sees a capital expense on its account, and the overnight batch processes book the asset to the plant account associated with the account organization. The system also maintains an equipment inventory.

Universities regularly expire accounts before they are closed in order to control the posting of expenses. When an account is expired, a continuation account is required, indicating where expenses for that expired account should now be directed. The Kualu Financial System handles transactions against expired accounts as follows:

- When a transaction comes through as part of a batch, the system posts it to the expired account's continuation account. Exception: If the expired account is a contract and grant account and if the transaction has occurred within the allowable number of days for posting to the account (determined by a system parameter), the transaction is posted to the expired account instead.
- When users create financial transactions, the system checks the account and, if it is expired, presents the option to use the continuation account. Users can choose to override the warning and still use the expired account. Institutions may set up special routing to provide

additional review for transactions in which the expired account has been used.

In the Kualu Financial System, accounts cannot be closed until their balances have been cleared. After an account has been closed, transactions can no longer be posted. Closed accounts may be reopened. Both the closing and reopening of accounts are controlled by permissions.

For a public higher education institution that is reporting as a governmental or business type entity, special tables and attributes in the Kualu Financial System support GASB reporting. The system also supports FASB reporting for higher education through the use of these same tables and attributes.

The Kualu Financial System can help ensure that an account does not overspend its budget. To do so, the system provides tables that allow institutions to set up budget control mechanisms called sufficient funds checking. Depending on institutional needs, sufficient funds checking may be set up to compare spending to the budget at the reporting levels of object code, object code level, object consolidation, and total account. In addition, the system provides cash sufficient control checking for non-budgeted accounts.

The Kualu Financial System's year-end closing mechanisms provide detailed carry forward and reversion functionality. This functionality allows each institution to decide at an organizational level whether to revert budgeted funds to a more centralized account at year end or carry them forward into the new year in the same account. After these organizational decisions are entered into Kualu Financial System tables, the system automatically processes the transactions based on the table setup.

Key Features for Procurement

The Purchasing/Accounts Payable (PURAP) module of the Kualu Financial System is a comprehensive requisitioning, purchasing and accounts payable module for higher education.

Six main types of e-docs make up this module: Requisition, Purchase Order, Purchase Order Amendment, Receiving, Payment Request and Credit Memo. Each electronic document contains a View Related Documents tab that displays a list of all related e-docs. For example, on a

requisition, the View Related Documents tab provides key data from, and links to, the purchase order and all related receiving e-docs, payment requests, and credit memos.

The system includes a business-to-business (B2B) component that allows requisitions to be generated from the contents of an online shopping cart. After the requisitions are generated, the completed purchase orders are automatically transmitted to the appropriate vendors. The system is also capable of receiving electronic invoices to complete the transmission of information. (Note: All transmissions—purchase order, invoice, etc.—use cXML.)

Key Features for Grants and Contracts

Research-intensive universities require extensive effort tracking and reporting for grant- and contract-related activities. To accommodate this need, the Kualu Financial System's Effort Certification module captures appropriate payroll data for contracts and grants. Effort is reported by percentage. Changes, which can be made by the project director, principal investigator, or fiscal officer, create a Salary Expense Transfer e-doc, which creates appropriate entries for both the labor ledger and general ledger.

The Kualu Financial System supports cost sharing with the use of special sub-accounts. The appropriate sub-account type, Cost Share, is associated with both the grant account and the cost sharing account from which the funds will actually be expended. When a purchase is made that will be covered by cost sharing, the cost share sub-account on the grant account is used. During a nightly processing, a transfer is made from the cost share account to the cost share sub-account on the grant account. Because all the cost sharing activity is located on the grant account in special sub-accounts, cost share transactions are easily identifiable and traceable between accounts, and on-line balance inquiries allow users to include or exclude cost share activity when they view accounts.

The office of contracts and grants administration is required to provide indirect cost transfers to cover institutional expenses, with rates varying by account and object code. The Kualu Financial System accommodates these complexities by applying varying rates at the account and object code level *and* at the sub-account level. It also provides the ability to exclude specific object codes or groups of object codes from generating

indirect cost. Indirect cost is calculated and assessed nightly based on the transactions that have posted to identified accounts and object codes.

Because the office of contracts and grants administration must be able to quickly report on project-to-date balances, the Kuali Financial System accumulates these balances for specified fund groups. It also provides drill-down capabilities into previous year details from the online balance inquiry screens.

Funding agencies sometimes do not pay for fringe benefits although they do pay for salaries. To handle this situation in the Kuali Financial System, an attribute on each account indicates whether the account pays for fringe benefits; if the account does not pay, the attribute specifies the account to which the fringe benefit is charged.

The Kuali Financial System workflow process allows for additional reviews and approvals to provide the extra oversight required for contract and grant activities. When an account is set for expiration (prior to being closed), the system requires that a continuation account be identified so charges against the expired account can be posted to the continuation account instead. This functionality is especially important for research activity because it helps prevent transactions from posting to a grant that has expired.

The Kuali Financial System was developed almost entirely by leading research universities. Complete support of contracts and grants is a key objective. To this end, another Kuali system, Kuali Coeus, supports budget and proposal development and all pre-award activities. It also supports compliance requirements, including institutional review board, conflict of interest, sub-awards, negotiations, and report tracking.

Upcoming Kuali Coeus-Kualি Financial System integration features will include the ability to automatically create an account in the Kuali Financial System when an award is received.

Kuali Financial System Functions and Features

This section provides additional information about Kuali Financial System processes, capabilities, and features in the areas of:

- Chart of accounts
- Procurement
- Vendor management
- Payables
- Accounts receivable
- Travel and expense
- Effort reporting and certification
- Capital assets management
- Encumbrances and commitments
- Grants and contracts
- Workflow for routing and approval of transactions
- Endowments

Chart of Accounts

The institution's organizational structure serves as the backbone for reporting and routing in the Kuali Financial System.

Basic Building Blocks of the Chart

Each chart of accounts contains many components. Foremost among them are organizations, accounts, and object codes.

Organizations are nested hierarchically in the chart of accounts to represent all levels of the institution's structure—from the campus as a whole, to the school or administrative unit, to the department. Schools and departments may choose to further divide organizations. For example, these additional subdivisions are sometimes defined for research centers or to improve workflow and reporting options within departments.

Accounts are another key component. In the Kualu Financial System, accounts include many attributes unique to higher education. For example:

- Three levels of responsibility—fiscal officer, account manager, and account supervisor—are assigned to each account.
- A higher education function code allows departments to classify expenses as instruction, research, etc.
- The restricted status code classifies the funds as restricted, unrestricted, or temporarily restricted.
- The sub-fund group code identifies the minor fund group for an account. Each sub-fund group belongs to a fund group that defines the source of funds. Both fund groups and sub-fund groups are defined by each institution to fit its needs. For example, Indiana University has set up a contracts and grants fund group with federal, state, and non-governmental sub-fund groups reporting to it. Other Kualu Financial System partners plan to set up contracts and grants as a sub-fund group reporting to a restricted funds fund group.
- Object codes in the Kualu Financial System classify the nature of each transaction. Like accounts, object codes have additional attributes to assist with reporting. Additionally, object codes belong to levels, and levels belong to consolidations. When creating reports, functional users use these levels and consolidations to sort and subtotal, thereby defining the order and structure of their reports.

Other chart components include sub-accounts, sub-object codes, and project codes. These components allow each school or department to further classify activity in its accounts to meet its own reporting needs.

Approvals for New Chart Components

Whenever a user creates a new chart component, the addition must be approved via Kualu Financial System workflow processes. In the default system:

- Each new organization or object code requires the approval of a chart manager (that is, a user serving in a central role defined to the system to oversee the chart of accounts as a whole).
- A new account requires the approval of both the fiscal officer for the account and the chart manager.

- Sub-accounts and sub-object codes require only the approval of the fiscal officer.

Other approvals may be added as needed using organization review. For example, if a dean of a school wants to see all new organizations created in her school, workflow for this school can be changed accordingly without making this routing required for all deans.

Mass Change Capabilities

The Quali Financial System provides mass change capabilities through "global" e-docs. These e-docs facilitate changes to multiple accounts simultaneously and enable mass creation of both sub-object codes and object codes.

Use of the global object code e-doc is restricted to Central Administration.

All global changes must be approved via workflow just as individual e-doc changes are.

User-Definable Attributes

The Quali Financial System allows each institution to define additional attributes in any reference table. To do so, the institution uses the system's "extended attribute" functionality. Extended attributes may be used for business rules, institutional and college- or department-level reporting, and workflow. For example:

- Michigan State University plans to create extended attributes for accounts. These attributes, which will be required only for plant fund accounts, will be used to specify the scope and overall budget of each associated plant fund project.
- San Joaquin Delta College has added three attributes—Source, Program, and Activity—to its Account table to track community college requirements.
- Colorado State University has added attributes to support additional workflow routing.

Procurement

System Capabilities and Process Flow

As noted previously, the six main types of procurement-related e-docs are Requisition, Purchase Order (PO), Purchase Order Amendment, Receiving, Payment Request, and Credit Memo. The subsections below highlight important controls and other functionality in the Kualu Financial System for each of these types of electronic documents.

Requisition

- Electronic document routing ensures that each requisition has been reviewed and approved by users who have fiscal responsibility for the request.
- The initiator specifies the goods or services requested, the location to which goods will be delivered, the person(s) requesting the goods or services, and the accounts responsible for the expenses. An optional "content" route level allows the person at the specified route level to complete the requisition details so the initiator needs only to identify the goods or services being requested.
- Requisitions may be initiated in either of two ways: a user fills in a blank Requisition e-doc, or, if business-to-business (B2B) shopping is employed, when the shopping cart is returned the B2B process creates the e-doc automatically with line item detail from the cart.

Purchase Order

- In the Kualu Financial System, this e-doc can be generated only from an approved requisition.
- User permissions to update this purchase orders are controlled by Kualu Identity Management.
- The Purchase Order e-doc includes the reason the vendor was selected, the source of the pricing on the order, lists of vendors who were included in a bidding process, payment terms and other important information about the purchase.

- Routing ensures that the completed e-doc has been approved (when appropriate) by a budget group, a research administration group, and a tax group.
- The approved e-doc reserves funds in the form of an encumbrance.
- The Purchasing Office has the ability to put a purchase order on "payment hold" if problems are found in an order. Payment hold ensures that Accounts Payable cannot process payments until the issues are resolved.

Purchase Order Amendment

- After a purchase order has been approved, any changes to it generate a Purchase Order Amendment e-doc.
- At the end of this process, the system adjusts encumbrances (if needed) and sends the fiscal officer an FYI if the amounts on the purchase order were adjusted.
- This e-doc provides tight internal controls. It identifies both the changes that were made and the person who made them.

Receiving

- If an institution wants to have a three-way match at the time of payment processing, it can require that the Receiving e-doc be completed before any payments to a vendor are made.
- The system's Receiving Threshold maintenance table offers each institution many ways to manage the receiving process. For example, receiving e-docs may be required for a particular chart, organization, account, object code, or vendor. Additionally, any particular purchase order may be set to require a Receiving e-doc.
- This e-doc records the number of items received and, if appropriate, the number of items returned.
- If the amount received is greater than the amount ordered, and if the shipment includes damaged goods or goods to be returned, the fiscal officer automatically receives an FYI when the Receiving e-doc is submitted.

- If the total quantity received on a purchase order is less than the quantity invoiced, the system will not route the payment request to the fiscal officer until the mismatch is resolved.

Payment Request

- A payment request can be generated only from an approved purchase order.
- This e-doc may be initiated either by an individual who has Kualu Identity Management permission or by the electronic invoicing process.
- Some of the controls in the Payment Request e-doc include:
 - Only the vendor identified on the purchase order can be paid.
 - Only line items that exist on the purchase order can be paid (Accounts Payable cannot add line items).
 - The quantity processed cannot exceed the quantity ordered unless the purchase order has specified "receiving required." If receiving is required, Accounts Payable may process a quantity greater than the quantity ordered.
- This e-doc routes to a fiscal officer for review and approval.
- When a specified dollar amount (which is controlled by a parameter) has been reached, or when receiving is required and a sufficient quantity has been received, the system automatically approves the e-doc one day prior to the pay date, thereby allowing timely payment. This control ensures that vendors are paid on a timely basis.

Credit Memo

- The Credit Memo e-doc returns funds to accounts. The credit is offset against subsequent payments to the vendor.
- Credit memos may be processed against a purchase order, a payment request, or a vendor ID.

Other Procurement Controls

Other controls built into the Kualu Financial System include the following.

- Automatic Purchase Order (APO): This e-doc is a purchase order that the system automatically generates from an approved requisition. Each institution's Purchasing Office controls whether the system can generate automatic purchase orders. Control may be based on specified organization limits or on vendors that are specifically restricted from this type of purchase order.
- Year-end processing ensures that payments are posted to the correct fiscal year during the post-back period.
- Year-end processing allows Purchasing to work on the next fiscal year's orders in advance. When this work occurs, the system encumbers funds in the correct fiscal year.
- Purchase orders that are considered sensitive (such as animal purchases for research) may be hidden from most users. This feature is controlled by permission in the Kualu Identity Management system.
- Commodity codes may (or may not) be required on the requisition and/or purchase order.
- When a commodity code is included on a purchase order, the system automatically updates the vendor's record with this commodity code.
- If desired, the system can collect data on capital asset purchases for transmission to the system's Capital Asset Management module.
- The system automatically applies sales tax to each e-doc based on the vendor's location and the location to which goods are shipped.

Receiving and Processing Procurement Card Transactions

Procurement card transactions can be delivered from third-party systems to the Kualu Financial System in an XML file. Data in this file is used to generate Procurement Card e-docs that are routed to the appropriate fiscal officer for approval.

The fiscal officer may update accounts, if needed, after which the system routes the Procurement Card e-doc for additional approvals. Organization approval may be established for these e-docs as well.

The system automatically approves procurement cards after a specified number of days. However, capital purchases are excluded from automatic approval until the all appropriate information (that is, all information

required to record the asset in the Capital Asset Management module) has been entered on the Procurement Card e-doc.

Each institution identifies reconcilers in the Procurement Cardholder Maintenance e-doc.

Loading, Entering, and Maintaining Vendor Catalogs

The Kualu Financial System does not yet support vendor catalog maintenance. However, two members of the Kualu community—University of California, Davis, and Michigan State University are collaborating to build this functionality. To understand how this type of multi-institutional collaboration fits into the Kualu development model and how it will result in enhancements for all who adopt the Kualu Financial System, see *Kualu Financial System Support* below.

Integration with Third Party Purchasing Platforms

The Kualu Financial System is integrated with the SciQuest business-to-business (B2B) e-marketplace. Before using this functionality, an institution must be a SciQuest client and must set up the required SciQuest parameters and URLs. After setup is complete, the purchasing process works as explained below.

When a user chooses the Shop Catalogs link on the main menu, the system displays the SciQuest e-marketplace, where the user can purchase from various vendors. After the user purchases the desired items, data about these items are returned to the Kualu Financial System, which automatically creates requisitions for each vendor. These requisitions follow the routing set up for other Kualu Financial System requisitions. After each requisition is approved, it becomes an automatic purchase order and is sent back to SciQuest for processing.

Assignment of Multiple Funding Sources on a Per-Item Basis

Each line item may have multiple accounting lines associated with it. Accounting lines may be added individually or applied globally with distribute-to-accounts functionality. The distribute-to-accounts option applies the default accounting information to all lines that do not already have accounts. After default accounting information has been applied,

users may change individual lines as desired. When the purchase order, Payment Request or Credit Memo e-docs reach the status at which general ledger entries are created, the accounts are summarized and the general ledger entry is booked in total.

Allocating and Encumbering Purchase Price plus Tax

Note: In the Kualu Financial System, a single set of sales tax tables supports both Purchasing/Accounts Payable and Accounts Receivable. This feature simplifies maintenance of the sales tax tables.

When sales or use tax is applicable:

- If sales tax is added, the vendor receives the tax payment at the time of disbursement to the vendor.
- If use tax is added, the liability is set aside until the institution remits to the state.

Vendor Management

The Kualu Financial System currently supports four types of vendors—purchase order, disbursement voucher, participant payment, and revolving fund. The disbursement voucher may use all four types, different business rules apply to each. For example, a disbursement voucher against a purchase order type of vendor routes to Purchasing for approval.

Key Attributes in Vendor Definitions

In the Kualu Financial System, a vendor is identified as an entity with a unique tax number. Vendor attributes provide information that is needed to fully satisfy procurement needs and tax reporting needs related to vendors. These attributes store business diversity information, addresses, contacts, contracts, tax number, tax ownership, search alias names, etc.

Other information stored for each vendor serves control purposes. For example, the "restricted" flag, "debarred" flag, and "active" indicator enable the system to control activity involving the vendor. Additionally, the "foreign vendor" indicator is used to route purchase orders, payment

requests, and disbursement vouchers to the tax manager for review and withholding as needed.

Institutions may specify a default address for any vendor. By providing a default address, the system eliminates the need for users to search through many addresses to find the address that is appropriate for use most often.

Institutions may assign commodity codes to vendors. After commodity codes have been assigned, users can quickly compile a list of potential vendors when creating a requisition or purchase order.

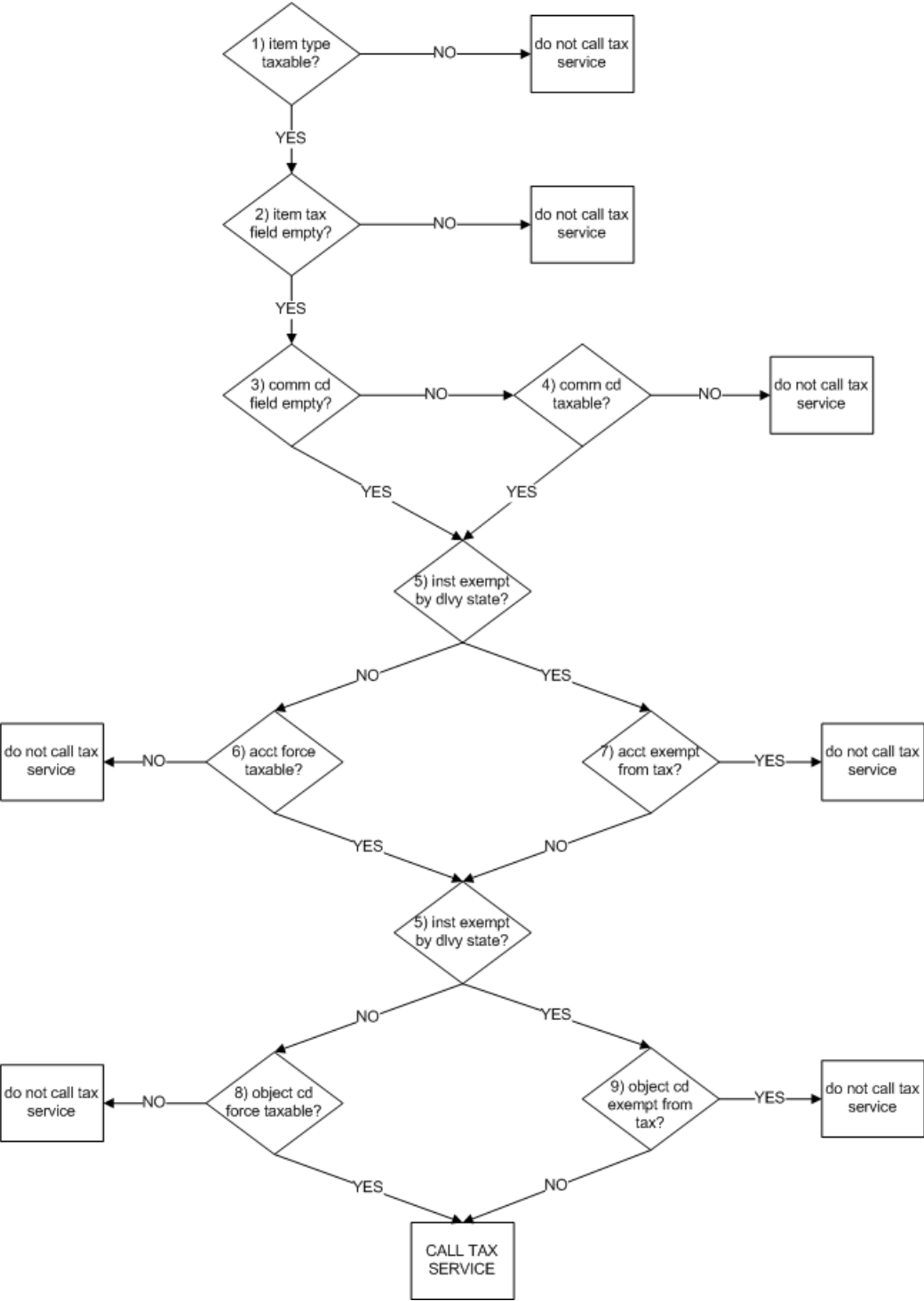
All changes to a vendor's information are recorded in an electronic Vendor document so a full history of all changes is available at all times.

Defaulting Vendor Tax Requirements

In the Kualu Financial System, system parameters allow each institution to turn sales and use tax on or off for the Purchasing module as a whole. If turned on, tax is assessed on the requisition, purchase order, and payment request. The Accounts Payable Department may correct or override the calculated tax.

If tax is turned on, parameters control whether specific object codes, fund groups, accounts, etc. should be excluded from tax. Each institution may also identify item types or commodity codes to be excluded from or included in tax assessment. Another parameter allows each institution to list states in which the institution is exempt from tax when goods are delivered to these states. The flow chart below lists the factors the system evaluates when determining whether to invoke the tax service.

PURAP Documents: When to Call the Tax Service



If all factors indicate that a purchase order or payment will be taxed, the system uses both the delivery address and the vendor's address to determine whether to apply sales tax or use tax. For example:

- If a product is delivered to New York and the vendor is also located in New York, the system applies *sales* tax on the requisition, purchase order, and payment request.
- If a product is delivered to New York and the vendor is located in Texas, the system applies *use* tax on the requisition, purchase order, and payment request.

Note, however, that an attribute on the Vendor record may be set to indicate that the vendor collects sales tax regardless of location. So, if this attribute is set to "yes," and if a product is delivered to New York and the vendor is located in Texas, the system applies sales tax, not use tax, on the requisition, purchase order, and payment request.

Once invoked, the Kuali Financial System sales tax service assesses tax based on tax rates set up for the state, county, or postal code in the delivery address.

1099 Processing

The Kuali Financial System's 1099 process enables the Accounts Payable Department to create both a 1099 form for the vendor and an electronic submission file for the Internal Revenue Service. The 1099 process extracts payments recorded in the Pre-Disbursement Processing module and payee information from the Purchasing/Accounts Payable Vendor table based on extraction criteria (vendor ownership type categories and object codes) specified in a parameter.

The application not only produces an electronic filing file and PDFs in batch mode but also allows users to print individual forms online for corrections. Note: Colorado State University used the 1099 application to submit approximately 1,400 1099 forms for calendar year 2009.

Payables

Receiving and Processing Electronic Invoices from Third Parties

After a vendor transmits electronic invoices in cXML format, a Kuali Financial System batch job is run to begin invoice processing. The system uses matching criteria to determine whether to initiate a payment request for fiscal officer routing (unless receiving is required and has not yet occurred) or to initiate an Electronic Invoice Reject document. The Accounts Payable Department researches each Electronic Invoice Reject e-doc and either approves it (in which case the system creates a Payment Request document) or disapproves it (in which case Accounts Payable staff contacts the vendor).

Matching criteria are determined by parameters, so institutions can easily apply their own business rules. For example, an institution may choose to match on the value in the Unit Cost field. The Cost Source e-doc contains upper and lower variance tolerances for unit cost, and the purchase order contains a cost source. As the system compares the unit cost on the purchase order to the unit cost on the electronic invoice, the variance tolerances are used to determine whether the unit cost is considered a match. A unit cost within the acceptable range of tolerances passes the validity check, whereas a unit cost outside the acceptable range is rejected.

Attaching Scanned Documents to Payment Requests and Credit Memos

Users may attach scanned documents to any e-doc. So, for example, Accounts Payable can conveniently add invoice images to payment requests and credit memo images to credit memos.

Each institution controls whether images are required on a Payment Request or Credit Memo e-doc. If images are required, the system will not route an e-doc to the fiscal officer until the image(s) have been attached. Permissions in the Kuali Identity Management module control whether specific users are allowed to view attached images.

Support for Vendor Payment Processing

The Kuali Financial System supports vendor payment via system checks, ACH, and wire transfers.

In order to ensure that credit memos are accounted for in vendor payments, payment requests and credit memos are bundled in the Purchasing/Accounts Payable module. The Pre-Disbursement Processing (PDP) module then extracts the bundled payment requests and disbursement vouchers for payment and formatting.

Once in Pre-Disbursement Processing, payments may be canceled, held, or set for immediate processing. In support of these activities, the module creates check, check cancel, and ACH XML files. Multiple payments to the same vendor may be combined into a single check. For ACH payments, the module automatically determines when payments can be made via ACH based on records in the Payee ACH Account table.

Note: PDP generates check and ACH data files in XML format. Software to properly format ACH files for transmission to a bank or to format and print checks is the responsibility of each institution.

Pre-Disbursement Processing sends entries to the general ledger to reduce cash and liabilities. The module also links disbursement information to the applicable payment request or disbursement voucher.

Note that wire transfers are *not* sent to Pre-Disbursement Processing. Instead, wire information is collected on the Disbursement Voucher e-doc, which is then used by Central Administration to process the wire.

Note also that manually drawn checks are not presently supported by the Kualu Financial System because Pre-Disbursement Processing provides capabilities to mark checks as "immediate" and print them separately. This situation will soon change, however, because the University of Arizona has developed a process to record pre-paid checks and plans to contribute it to the Kualu community.

Application Voucher Matching Capabilities

All payments must be made against line items on a purchase order. If an invoice contains line items that are not found on the associated purchase order, Accounts Payable must work with the Purchasing Department to resolve the discrepancy.

Managing Inter-Departmental Billings

The Kualu Financial System has two e-docs that facilitate interdepartmental billing:

- The Internal Billing e-doc, which routes for approval to the fiscal officer of the account(s) being charged.
- The Service Billing e-doc, which is a restricted access e-doc for use when the purchasing and selling departments have an agreement so the transaction and does not require approval.

The system supports batch feeds from inter-departmental billing units with a collector file upload. Uploaded transactions may be in XML or a flat-file format. Collector feeds are validated in the batch process and are then posted to the general ledger. Duplicate files are removed from processing, and billing units are notified via automated emails of this and other errors in their transactions. Additional information (such as, details about goods ordered or services performed) may be sent with the collector file, and this information is then available for querying via a reporting system.

Accounts Receivable

System Capabilities and Process Flow

The Accounts Receivable module allows units (usually referred to as "billing organizations") to invoice external (typically, non-student) customers for goods or services. Payments received for these goods or services are processed by a centralized unit (or "processing organization"). The module includes six main types of e-docs: Customer, Invoice, Credit Memo, Write-off, Cash Control and Payment Application. The subsections below highlight each one.

Customer

The Customer e-doc allows users to create and maintain records identifying Accounts Receivable customers. Each e-doc has one primary address and (optionally) several alternate addresses for the customer. This e-doc also has a customer search feature that allows users to access a customer history report, which shows all Accounts Receivable activity for this customer.

Note: Customer records may also be fed into the system in batch from other receivable systems on campus.

Customer Invoice

The Customer Invoice e-doc is created by a billing organization user to charge an external customer for goods or services. The customer invoice uses information from the customer database to identify the billing and shipping addresses. The accounting lines on the invoice represent the items being billed to the customer. Information on each accounting line includes chart, account, object code, quantity, unit price, tax amount and item description. A single invoice may have many accounting lines.

Once the invoice is in "final" status, it can be printed and mailed to the customer. The Kuali Financial System generates a PDF document suitable for printing or emailing. PDFs may be generated on an invoice-at-a-time basis or in batch by the user initiating the invoice, all users within the same billing organization, or all billing organizations services by a processing organization.

The Customer Invoice e-doc also has recurrence functionality, which allows a user to set up a future recurrence of an existing invoice.

Customer Credit Memo

The Customer Credit Memo e-doc provides a means for crediting an amount or quantity against an existing invoice record. The amount credited will generate a reversal of the invoiced amount in the general ledger.

Customer Invoice Write-off

The Customer Invoice Write-off e-doc provides a means for crediting an uncollectible invoice balance. Based on institutional options, the balance of the invoice will be posted in the general ledger to either a write-off object code within the same account originally credited or to a designated write-off account for the billing organization.

Cash Control

The Cash Control e-doc is created by a processing organization user. Each e-doc represents a batch of invoice payments and can reflect a variety of payment types (check, credit card, wire, etc.). Each detail line in the Cash

Control e-doc represents an individual payment by a customer and automatically creates a Payment Application e-doc for each payment (see below). If the payment medium is "check," the total of the Cash Control e-doc is posted to the general ledger as a deposit of cash. For other payment mediums (credit card, wire), the general ledger entries are based on system information set up for those mediums.

For certain payments received in the bank lockbox, the system generates the Cash Control e-doc automatically. This automatic generation occurs only when there is a one-to-one match of the invoice and the payment received by the bank.

Note: Payment records are received in a file generated by either the bank or a cashiering operation on the campus. The file is then uploaded to the Kualu Financial System.

Payment Application

Payment Application e-docs are automatically created when a detail line is added to the Cash Control e-doc. The Payment Application e-doc—which represents one payment—is used to apply the payment to one or more customer invoices. If no invoice exists for a particular payment, the Non-AR section on the Payment Application e-doc allows users to apply funds to a departmental account or to be held on the customer record in anticipation of future invoices.

Reports

Within the Kualu Financial System, users can create the following Accounts Receivable reports:

Customer Billing Statement: This option generates a PDF billing statement showing all outstanding invoices for a customer.

Customer Aging Report: This report shows all outstanding amounts for customers in a specific billing or processing organization. The report may also be run for a specific account. Any outstanding amounts are categorized into "aging buckets" based on the due dates of the invoices. To display a list of invoices representing any amount shown on the report, the user simply clicks on the amount.

Travel and Expense

The Kualu Financial System does not yet include a travel module. Several institutions are now collaborating on the development of such a module under the leadership of the University of California, Davis. The new module will be based on an existing travel module developed by Indiana University.

Defining and Applying Travel Policies

Although the design of the Kualu Financial System travel module is not yet complete, the following functionality will be included:

- Travel authorizations for out-of-state and foreign travel must be granted before pre-payments or reimbursements can be processed.
- The travel reimbursement e-doc routes to a centralized travel office. This office reviews expenses to ensure that all applicable policies are being followed.
- Automatic calculations for mileage and per diem ensure that these expenses are consistent with travel policies.

Submitting and Processing Expense Reports

In the current Kualu Financial System, the disbursement voucher supports limited travel expense reimbursement functionality for non-employees. Institutions may also use the disbursement voucher for employee travel. Note, however, that the system does not match the disbursement voucher to travel authorizations.

Note: The following descriptions pertain to the functionality and features of Indiana University's base travel system—the system on which the Kualu Financial System travel module will be based.

The entire travel system is based on the ability to process expense reports. The system handles multiple expense reports as follows.

- In-state travel requires an open authorization for repetitive trips.
- This process encumbers the funds, but reimbursements that are associated with this authorization disencumber only the actual amount that was reimbursed.

- This type of authorization must have begin and end dates; trips that occur outside of this date range are not allowed.
- A batch job disencumbers funds based on the end date of authorization and the parameter date of the batch job.

Processing and Reconciling Travel Advances

Note: The following descriptions pertain to the functionality and features of Indiana University's base travel system—the system on which the Kuali Financial System travel module will be based.

If a travel advance was given during the authorization phase of the trip:

- The travel system compares the advance to the out-of-pocket expenses.
- If the amount of expenses is greater than the amount of the advance, the remainder is distributed to the traveler.
- If out-of-pocket expenses are inadequate, the system sends an automatic notification to both the traveler and the fiscal officers defined in the account segments of the authorization, indicating that the remaining advance is due.
- If a traveler owes all or part of an advance, the system disallows future advances and allows collections to occur on future reimbursements.

If the accumulation of advances is greater than zero at year end, the system automatically posts the amount due on the traveler's taxable income in the institution's payroll system.

Effort Reporting and Certification

Supporting Compliance with Federal Effort Reporting Guidelines

Payroll certification (commonly known as effort reporting or effort certification) is required by the Federal Office of Management and Budget in Circular A-21, section J.10. To facilitate compliance, Kuali Financial System effort reports specify each individual's time worked on contract and grant accounts. Effort reports include 100 percent of the individual's base salary broken down by account and effort as a percentage that covers the reporting time period (e.g., six months, three months, etc.).

All Quali Financial System effort reports are created from the labor ledger. Assuming that type, earnings type, and earnings date information is provided by an institution's payroll system, the effort report can include type, earnings type (such as, leave), and earnings date (such as, not paid date).

Each effort report provides two views:

- The principal investigator (PI) view includes only the information needed for review by the principal investigator.
- The detailed view includes additional financial information for the fiscal officer.

Each effort report provides the original effort and amounts as well as any adjustments, so viewers can easily identify what has been changed.

By default, effort reports route to the project director or principal investigator and to the fiscal officer associated with the accounts involved. When business rules vary across colleges and/or departments, additional organization review routing can be established to meet each unit's requirements.

When reviewing a report, the project director, principal investigator, and fiscal officer have the option of correcting the distribution of effort percentage associated with the accounts. After any of these users change an effort report, the system automatically creates a Salary Expense Transfer e-doc and routes it for approval.

Whenever an effort report period is open, no manual salary expense transfers can be processed on contracts and grants.

When necessary, effort reports may be recreated and salary expense transfers may be created by a user with appropriate permissions.

Generating Appropriate Accounting Entries

As noted above, when a change is made to an effort report, the system automatically creates salary expense transfers and routes them for approval. Each Salary Expense Transfer e-doc creates both actual and A21 transactions in the labor ledger:

- Actual transactions flow through to the general ledger and are posted in the period in which the correction was made.

- A21 transactions properly reflect effort in the reporting period.

The Labor Ledger View balance inquiry shows both the actual view and the A21 view.

Visibility of In-Process and Completed Approvals

All e-docs include a Route Log tab that indicates where an e-doc has been (who has approved it), where it currently is (who needs to approve it now), and where it will go next (all others who need to approve, as indicated in the future actions list).

Any particular e-doc or e-docs can be found via the system's Document Search function. Additionally, the following reports are delivered with the system to assist in tracking effort certifications.

- Duplicate Certifications Report
- Effort Certification Extract Build
- Outstanding Effort Reports by Chart/Organization/Report
- Outstanding Certifications By Report

Capital Assets

The system uses an attribute (object sub-type code) on the object code to identify a purchase as capital. This field is also used to define asset categories and to further define assets as federally titled or funded. Listed below are some examples of Object Sub-Type Code values.

- AM – Art and Museum
- BD – Buildings
- BF – Buildings Federally Funded
- BI – Bonds
- IF – Infrastructure
- LA – Land
- LI – Library Books
- LR – Land Improvements
- CM – Movable Equipment

- CF – Movable Equipment Federally Funded
- CO – Movable Equipment Federally Owned
- UC – Movable Fabrications
- UF – Movable Fabrications Federally Funded
- UO – Movable Fabrications Federally Owned

Additionally, each asset record has a field to designate ownership or title. Institutions may also add extended attributes to asset object codes if needed.

Capabilities and Process Flow

Creating or Modifying Assets

Both the Kualu Financial System Requisition e-doc and most financial processing e-docs contain a tab in which users may enter information about a capital asset. When a capital object code is specified on the document and asset-related parameters are met, several fields on this tab are required. For example, on a requisition, the user is asked to indicate whether this is a new system, single system, or multiple system. In addition, the user can specify if this purchase will modify an existing asset or be a fabricated asset. The requisition allows the user to provide the asset number to which the purchase order line item(s) should be applied. On financial processing e-docs the user can specify the serial number, model number, manufacturer, and where the asset will be located. Asset information on the requisition and the financial processing e-docs is then passed into the Capital Asset Builder, where the asset is created.

The Kualu Financial System offers pre-tag features that allow users to assign a tag number when a purchase order is in final status even though the asset cannot yet be entered into the system.

When payment requests are posted to the general ledger, the system posts the capitalization entries to the plant accounts associated with the account on the line item (via the plant account attribute on the Organization table).

When payment requests are processed on the purchase order for one or more capital assets, the appropriate items are picked up by the system's Capital Asset Builder. This component presents the Purchasing/Accounts Payable Transactions screen, where the user may combine and/or split line

items when creating movable assets and process any related payment or credit memo requests.

- If the asset does not yet exist, the system passes the line items to the Asset Global e-doc when the user clicks the Apply Payment button.
- If the invoiced line item modifies an existing asset, the system opens the Asset Manual Payment e-doc instead.
- If pre-tagging has been used, the Capital Asset Builder also connects the tag number to the transaction. When the user clicks the Create Asset button, the system checks to see whether pre-tagging data exists. If it does, the system retrieves the data and displays it on the Asset Global (Add) e-doc, where the user creates the asset and adds it to the database.

The Capital Asset Builder also picks up transactions from other financial processing e-docs (General Error Correction, Internal Billing, Procurement Card, etc.). Authorized users can then process these financial transactions in the General Ledger Transactions screen. Most of the information required to create or modify the assets has already been collected on the financial documents themselves, so this screen is simple to use and few actions are required of the user in order to add the payment information to the database.

Users can manually add assets to the system via either of two e-docs—Asset Global or the Asset Manual Payment. The Asset Global Document allows the user to add gifts and transfer-in assets and to create non-movable and non-capital assets. The Asset Manual Payment e-doc allows users to add non-movable additions to the database after the asset has been created via the Asset Global e-doc. The Asset Manual Payment e-doc can also be used to shift payments from one asset to another.

Maintaining Assets

The Capital Asset Management module supports many asset-related activities, including editing asset information, updating information on equipment loans and loan extensions, merging and separating assets, fabricating assets, and transferring assets from one organization to another. Each of these activities (explained further in the subsections below) is accomplished through an appropriate type of e-doc.

The module also provides two asset-related search screens. One is Asset Lookup, where users may retrieve assets by tag number, asset number, vendor, manufacturer, serial number, or location. The other is Payment Lookup. In this screen users retrieve assets using the purchase order, document number, or account number. Both search screens are very powerful. For each asset retrieved, the screens include links to some of the asset-related activities noted above. These links provide the starting point for the various activities. Note: Active links are displayed in search results only for activities a user has the authority to perform.

Asset Edit

The Asset Edit screen allows users to:

- Tag an asset.
- Move an asset from construction in progress to complete.
- Update location information.
- Create a warranty.
- Create a repair history.
- Create a component.
- Add additional information for land assets.

Loan|Return|Renew

The Loan e-doc is used to track assets that are on loan to faculty or staff. If an asset is not on loan, the "loan" link will be active. If the asset is actively on loan, then the "return" and "renew" links will be active instead.

Each link causes the system to display the appropriate e-doc for performing the selected activity. Each e-doc displays the necessary fields and, where possible, pre-sets the data needed to complete the document. For example, the Return e-doc pre-sets the return date so the user needs only to submit the document.

Merge

Upon physical inspection of assets, it may be determined that two or more separate assets have been created but, because they work together as a system, they should be combined (merged) into one asset. The Merge Asset e-doc enables users to effect this merger by prompting the user to specify a "target asset" and one or more assets that will be merged into it.

Note: Assets that are merged into the target asset are eventually retired as the result of merger. The system automatically assigns a Retirement Reason code of "M" (Merged) to these assets.

Note: The Merge Asset e-doc is restricted to the users in the roles of KFS-SYS Asset Manager, KFS-SYS Plant Manager, KFS-SYS Asset Processor and KFS-CAM Manager.

Separate an Asset

Capital assets are created based upon information from the Purchasing/Accounts Payable module. In some instances Purchasing may not clearly indicate that more than one asset is being purchased. To accommodate this situation, from the Asset search screen, a user may separate an asset into several assets with the same total cost or may separate it into several assets with different individual costs. From the Asset Payment lookup screen, the user may also separate assets by payment.

Use of this function is restricted to the KFS roles, KFS-SYS Asset Manager, KFS-SYS Plant Manager, KFS-SYS Asset Processor and KFS-CAM Manager.

Asset Transfer

The asset transfer function moves an asset from one organization to another. The electronic Transfer document generates the ledger entries to move the asset from the current owner's plant fund account to the receiving organization's plant fund account. The transfer transaction also creates a payment "audit history" on the asset.

Asset Retirement Global

The Asset Retirement Global e-doc is used to record the financial transactions associated with disposals of capital assets from the Capital Asset Management module. This electronic document is also used to change the status of the asset.

The Asset Retirement Global e-doc includes a menu of reasons for the retirement (external transfer, sale, auction, stolen, destroyed, etc.).

As a rule of thumb, retirement entries affect only the balance sheet object codes within the plant fund. The investment cost (capitalized), accumulated depreciation, and gain/loss on the disposition of assets object codes are affected. Cash is not affected by the retirement of an asset.

Asset Fabrication

Assets that are created or built by a university or other institution are considered to be movable fabricated equipment. The Asset Fabrication Maintenance document creates an asset record that describes a constructed asset. "Construction in progress" assets are identified by a specific asset type code.

Asset Location Global

The Asset Location Global Maintenance screen allows users to change the intended asset's campus, building code, room, sub-room and tag number. This screen allows the user to add assets one at a time or add multiple assets using a Look Up/Add Multiple Asset Lines search button that allows the user to search for and select multiple assets at the same time.

Barcode Inventory Process

The Capital Asset Management module facilitates the use of barcode scanners for departmental inventory by allowing users to upload text files from scanners. The system matches the uploaded data against assets defined in the Capital Asset Management module. Items that do not match are added via a Bar Code Inventory e-doc. Users can then work in this electronic document to correct locations if needed. The inventory process updates the location and condition of the asset.

Universities may use various types of barcode reading machines depending on their needs. Although departments scan the equipment, the upload of the inventory file into the Kualu Financial System is a central process restricted by Kualu Identity Management. Non-capital assets may also be scanned using the barcode scanning equipment.

While any barcode devices can be used, the scanned output file must conform to a specific .csv format. For example:

IU016562,1,06122005131216,BL,BL569 ,130 ,1 ,G

File output	Description
IU016562	Tag number

1	Scan code. Identifies whether the record was scanned or entered from the keypad. Scan Codes: 1 = hand entered 0 = scanned
06122005131216	Date/time stamp
BL	Campus
BL569	Building
130	Room number
1	Sub-room
G	Condition
A	Inventory status

Depreciation

Capital Asset Management supports straight line depreciation with and without salvage value and allows depreciation conventions for full year or half year. Asset depreciation may be calculated as desired by each institution—monthly, quarterly, or yearly.

Defining Components with Different Depreciation Approaches

Components of an asset may be identified and tracked in the system by breaking a single asset record into several records. Each record may have a different depreciable life and a different approach to straight line depreciation (that is, either with or without salvage value). By using the same description on each record and employing a reporting program, institutions can total the component asset records to obtain information for the entire asset.

Note that true componentization allowing individual depreciation methods within the same asset record is planned for future development.

Encumbrances and Commitments

Managing and Processing Pre-Encumbrances

The Kualu Financial System's electronic Pre-Encumbrance document allows departments to establish and liquidate pre-encumbrances in the general ledger. The Pre-Encumbrance Details section of this e-doc allows a user to specify a reversal date that causes the system to automatically reverse the pre-encumbrance entry on the date specified.

The system allows users to view the effect of pre-encumbrance transactions via several general ledger balance inquiries. The following inquiries can access or include pre-encumbrance data:

- Available Balances
- Balances by Consolidation
- General Ledger Balance
- General Ledger Detail
- General Ledger Pending Entry
- Open Encumbrances

Note: The Open Encumbrance inquiry provides both the original/open amount and the amount of the encumbrance that has been relieved. The difference represents the outstanding encumbrance balance.

Managing, Processing, and Overriding Encumbrances

Purchase orders are encumbered when they reach "final" status. If a purchase order is then voided or canceled, the encumbrance is liquidated. Purchase orders may also be amended, and an amendment may alter the encumbered amount. For a specified period of time (established by a parameter value), purchase orders can be set up and encumbrance entries posted to the upcoming fiscal year.

When payment requests are processed, encumbrances are liquidated based on the quantity ordered or the amount invoiced for services. At the start of a new fiscal year, payment requests and the associated encumbrance entries may be eligible to post back to the prior fiscal year. The post-back period is controlled by a parameter value.

Additionally:

- Inter-departmental billing units may establish and liquidate encumbrances via the Collector Batch Upload file.
- Central Administration may set up or relieve encumbrances by processing a journal voucher or by submitting entries via the General Ledger Correction Process e-doc.
- The system may be configured to automatically generate cost share encumbrances to assist with forecasting and management of cost share agreements.

The base installation of the Kualu Financial System categorizes encumbrances by using different balances types to support financial reporting: EX (external), IE (internal), PE (pre-encumbrance), and CE (cost share).

The system provides numerous labor and general ledger inquiry capabilities that display budget, actual, encumbrances, and variance amounts. These figures are also available for extract in CSV, spreadsheet, and XML formats.

Managing and Processing Multi-Year and Multi-Funding Sources

The Kualu Financial System does not provide functionality to manage multi-year/multi-funding sources for faculty startup commitments outside of the recorded ledger transactions. The system's Fiscal Year Maker process may be modified, however, to copy forward chart data for additional fiscal years (beyond the next fiscal year). Commitments may then be posted to these future fiscal years and the amounts may be accessed through reports.

Adjustments to encumbrance amounts may be entered:

- In the labor ledger via the Labor Ledger Journal Voucher and Labor Ledger Correction Process e-docs. With the next major release (4.0) of the Kualu Financial System, the Labor Batch Enterprise Feed Upload will also be available to handle adjustments.
- In the general ledger via the Pre-Encumbrance, Journal Voucher, and General Ledger Correction Process e-docs or via the Collector or General Ledger Batch Enterprise Feed Upload.

Managing and Processing Encumbered Salaries

The Kualu Financial System supports both labor and general ledger encumbrance transactions, whether they represent fiscal year-end, grant year-end, or multi-year amounts. Currently, however, most payroll systems seem to be unable to support encumbrances beyond the current fiscal year. Even so, the Kualu Financial System allows adjustments to encumbrance amounts to be entered in both the labor ledger and the general ledger as specified in the preceding subsection.

Note that both ledgers also provide beginning balance periods for inception-to-date totals. These additional placeholders for prior fiscal years' cumulative amounts facilitate inception-to-date reporting. Through the system's inquiry screens or an external data warehouse, institutions can quickly retrieve inception-to-date amounts by reporting on the current fiscal year and including the beginning balance periods in the results.

At fiscal year-end the Encumbrance Forward process rolls forward general ledger encumbrance balances to the new fiscal year. This once-a-year process references the Open Encumbrance file, determines the outstanding encumbrance balance, and creates encumbrance transactions for posting.

Grants and Contracts

Handling Post-Award Processing of a Grant or Contract

The Kualu Financial System facilitates the linking of awards and proposals to accounts but, at present, users must create accounts and budgets manually.

Integration with release 4 of the Kualu Coeus System will automate account and budget creation. As of this writing (April 2010), the integration team is developing integration specification documents. The plan is to create the Kualu Financial System's Account e-doc automatically from the Kualu Coeus Award e-doc. Award information will be merged with supplemental information stored in the Contract and Grant Account Default table. The institution will then have the option of either blanket approving the account or routing it normally to approvers. Additionally, Kualu Financial System budget adjustment transactions will be created from the Kualu Coeus award budget.

Managing Cost Sharing on Grants and Contracts

The Kualu Financial System supports cost sharing with the use of special sub-accounts with the sub-account type of Cost Share. This type is associated with the grant account and specifies a cost sharing account that will actually bear the expenses being cost shared. When a purchase is made that will be covered by cost share, the cost share sub-account is used with the grant account. During nightly processing a transfer is made from the cost sharing account tied to the cost share sub-account on the grant account.

Online balance inquiries allow users to view accounts with and without cost share. Cost share transactions are easily identifiable and traceable between accounts.

Workflow

This section provides information about standard and optional routing for the most commonly used procurement documents.

Requisition Workflow

By default, a requisition may be initiated by any faculty, staff, or employee user. Routing for review and approval of the requisition may include any of the following:

- **Content Review:** This form of routing allows requisitions to be submitted without complete accounting information. The submitted requisition routes to a content reviewer for completion and approval.
- **Initiator:** If content review is not set up and an account has not been specified, this form of routing returns the e-doc to the initiator for completion.
- **Sub-Account:** If the requisition includes a sub-account and the sub-account has a routing rule established, sub-account routing sends the requisition to the person, group, or role for which the rule was established.
- **Fiscal Officer or Delegate:** This type of rule routes the document to the person identified on the account as the fiscal officer or to a delegate identified by this fiscal officer. Delegation may be set by account and dollar amount.

- **Organization Review:** Organization review routing may be set up at any level in the organization hierarchy and may be applied to any document type (not just requisitions). For example, the College of Arts and Sciences might set up a rule to review all e-docs affecting accounts reporting to this organization (including all organizations that are part of the college, such as, English, Chemistry, Physics, etc.). This type of review may be qualified by dollar amount and may route for approval, acknowledgement, or FYI.
- **Commodity:** If routing has been set up for a particular commodity code, this rule routes an electronic document to the user, group, or role assigned to this commodity code.
- **Separation of Duties:** This rule routes a requisition to a defined central approver if the amount of the e-doc exceeds an institutionally defined threshold and if there have been no approvers other than the e-doc initiator. This routing ensures that requisitions above a specified dollar amount are approved by at least two users.

Purchase Order Workflow

In this system, every purchase order must be based on a purchase requisition. A PO may be created from a requisition in two ways—automatically (by the system) or by assigning a contract manager to it (a function performed by the Purchasing Department).

The following route nodes may be triggered by a regular purchase order. Different route nodes are triggered by purchase order amendments, splits, etc.

- **Internal Purchasing Review:** This review is triggered when the user who submitted the PO is not a contract manager and the dollar amount of the purchase order exceeds the limit defined by the contract manager for POs submitted by support staff. This route level ensures that contract managers directly review purchase orders over a specified dollar amount.
- **Commodity Code Review:** This review is triggered when a commodity code on any line item requires approval by a designated individual, group, or role.
- **Contracts and Grants Review:** This review is triggered if a grant account is specified in the Items section of the purchase order and if

the object code is one that the Contracts and Grants Office wants to review.

- **Budget Office Review:** If sufficient funds are turned on for any account on the purchase order and if the encumbrance would exceed the available funds, the purchase order is routed for budget review.
- **Vendor Tax Review:** If the vendor used on the purchase order is a foreign vendor or the vendor's tax number matches a tax number in the Employee table, the e-doc routes to the Tax Manager role.
- **Document Transmission:** If the e-doc is an automatic purchase order, an FYI is sent to the initiator of the Requisition e-doc. If the e-doc is not an automatic purchase order, an FYI is sent to the user who submitted the purchase order.

When the purchase order reaches "final" (fully approved) status, the system encumbers funds. The purchase order is now open for processing payment requests.

Payment Request Workflow

Accounts Payable initiates a payment request against an open purchase order. Routing criteria for the payment request include:

- **Accounts Payable Review:** If invoice images are required (by institution parameters), images must be attached at the Accounts Payable Review route level.
- **Receiving:** If an order has been flagged for receiving or meets the thresholds established for receiving, receiving must be completed by the department or by Central Receiving before the system can route the payment request for approval.
- **Sub-Account:** If the e-doc uses a sub-account and if a routing rule has been established for the sub-account, the e-doc routes to the person, group, or role for which the rule has been established.
- **Fiscal Officer or Delegate:** The e-doc routes for approval to the person identified on the account as the fiscal officer or as a delegate identified by the fiscal officer. Delegation may be set by account and dollar amount.

- **Organization Review:** Organization review may be set up at any level in the organization hierarchy. For example, the College of Arts and Sciences can set up a rule that enables them to review all e-docs affecting accounts reporting to their organization (including all organizations that are part of the college, such as, English, Chemistry, Physics, etc.). As is true for any type of e-doc, this review may be qualified by dollar amount and may route for approval, acknowledgement, or FYI.
- **Tax Approval:** This routing is triggered for payment requests involving payments to non-resident aliens or employees.

Unless a payment request is flagged as requiring approval (either on the payment request or in the Approval Required table) or special approvals are required for this payment request, the system auto-approves the request after a specified number of days.

The payment request reduces the encumbrance and posts the expense and liability. The payment request is then extracted and fed into the Pre-Disbursement Processing module for payment. Pre-Disbursement Processing relieves the liability and generates a cash entry into the general ledger when payment is disbursed.

Support for Definition of Different Local Routing Rules

As noted above, the Kualu Financial System supports organization review routing. Each unit may set up this type of routing to meet its individual needs. Organization review may:

- Be established by e-doc type and amount.
- Be routed to a group or individual.
- Specify the type of action requested—approval, acknowledgement, or FYI.

Additionally, the various types of electronic documents in the Kualu Financial System are set up in a document hierarchy. This structure allows institutions to set up organization reviews at any point in the *document* hierarchy *as well as* at any point in the *organization* hierarchy. For example, the College of Agriculture (Org=AG) may want to see all transactional e-docs that are created by any organization that reports to the college. Rather than setting up an organization review for each individual

transactional e-doc and each organization, the college can set up one organization review for all KFST (that is, Kualu Financial System transactional) e-docs and Org AG. In this case, every e-doc that rolls up to KFST, and that uses an account that belongs to an organization that rolls up to AG, will route to the group, role, or individual specified for the requested action.

Flexibility for Handling In-Process Transactions

The Kualu Financial System supports ad-hoc route requests. These requests may be initiated at any point in an electronic document's life, even after the document is final. Ad-hoc requests may be sent to individuals and groups.

Ad-hoc action requests include Approve (available only if the e-doc is not fully approved), FYI, and Acknowledge. Both FYI and Acknowledge requests may be sent to non-KFS System users (that is, users who are allowed to initiate most e-docs and use inquiries and search screens). So, if a user wants to let a principal investigator (PI) who is not a KFS System user know about a particular transaction, the user can send the PI an ad-hoc FYI or Acknowledge request.

Visibility of In-Process and Completed Transactions

The Document Search feature allows users to locate any Kualu Financial System e-doc. After retrieving search results, a user can click on the Route Log icon to display information indicating who has already approved the e-doc, who needs to approve it now, who will need to approve it in the future, etc. Optionally, users may obtain the same information by opening an e-doc and opening the Route Log tab.

The system also provides several custom document searches that allow users to search by different fields depending on the type of e-doc selected. For example, if users select:

- Purchase order search, they can search based on the requisition number.
- Disbursement voucher search, they can search on payee name or payment reason.

- Effort certification search, they can search on organization or employee.

On every electronic document, the Route Log tab contains links that allow users to drill down into any route node to determine why this e-doc requires a particular person or group's review.

Below is an example of the Route Log tab that shows the reason for each approval request.

The screenshot shows a web interface for a 'Route Log' for document ID 3510. The document title is 'Requisition - microscope'. The initiator is HUNTLEY, KEISHA Y. The status is FINAL. The route node is 'Join'. The table below shows the sequence of actions:

Action	Taken By	For Delegator	Time/Date	Annotation
SAVED	HUNTLEY, KEISHA Y.		03:48 PM 03/22/2010	
COMPLETED	HUNTLEY, KEISHA Y.		03:57 PM 03/22/2010	
APPROVED	BENFROW, ROBERTA G.		03:59 PM 03/22/2010	
APPROVE	RENFROW, ROBERTA G.		03:57 PM 03/22/2010	KFS-SYS Fiscal Officer 1021887 BL
APPROVED	RICHARDS, JANNA E.		04:04 PM 03/22/2010	
APPROVE	RICHARDS, JANNA E.		03:59 PM 03/22/2010	KFS-SYS Accounting Reviewer 20000 PRAP BL PSY

In this case, fiscal officer review is required for account BL-1021587. Accounting (organization) review is required for PRAP (that is, purchasing e-docs) over \$20,000 for BL-PSY.

Support for Local and University-Wide Workflow Rules

The system's Organization Review e-doc allows units to establish organization review routing by e-doc type and amount. This form of routing creates "stops" at the point in the organization where the route is established. Units normally add stops at their own organization level or below.

Institutional organization review uses the same type of electronic Organization Review document, but routing is established at the top of the organization hierarchy. For example:

- The College of Agriculture creates an organization review rule for its organization so it can review all budget adjustments created by its departments. Subsequently, all budget adjustments created at or below the College of Agriculture organization route according to this rule.

- The Budget Office wants to see all budget adjustments for the university, so it creates an organization review at the top level chart and organization. Subsequently, all budget adjustments for the university route through this office.

Each institution is also free to set up organization review routing for the Org Review e-doc itself in order to ensure that changes to organization routing are not made without approval.

Note that special condition routing, such as, sub-fund, commodity code, tax, separation of duties, etc., is maintained centrally and cannot be changed by the departments.

In addition to organization review routing, fiscal officers can establish account delegation routing so delegates can approve designated e-docs on the fiscal officer's behalf. Routing to a delegate can vary by e-doc type and by amount and start/end dates. Additionally, delegation can be primary or secondary:

- Primary delegation routes e-docs directly to the delegate by adding them to the user's "action list."
- Secondary delegation allows the delegate to retrieve e-docs for which he or she is the delegate but does not route these documents to the delegate's action list.

Note that the fiscal officer can access any of his/her own e-docs for approval at any time, regardless of delegation.

Delegation may be set up globally and may be maintained via an Account Delegate Model e-doc. This electronic document applies a standard set of delegations to a newly established account.

Endowments

The Kualu Financial System currently provides functionality for general recordkeeping for endowments.

Note: With the release of the Kualu Endowment Module (KEM) in late 2010, endowment capabilities will be greatly enhanced. The information below pertains to this upcoming release.

Endowment funds (and similarly invested long-term funds) and their corresponding investments are key components of the financial structure

of most colleges and universities. With the release of version 4.0, the Kuali Financial System will include an endowment module that will account for these investments, investment transactions, and obligations, as well as the underlying funds to which the assets and liabilities belong.

The Kuali Endowment Module will actually be a standalone application: it may be used with the Kuali Financial System or on its own. The system will be independent of the gift processing and general ledger systems in use at an institution. Its endowment data tables will be structured, however, in a manner that accommodates interfaces to and from other systems via batch feed.

Although the Kuali Endowment module is designed to work as a standalone application when needed, like the Kuali Financial System it will:

- Use Kuali Workflow to control transaction processing authority.
- Use Kuali Identity Management to provide appropriate roles and permissions to manage access to endowment processing and data. Additional security restrictions may be configured by the institution.
- Allow users to link imaged document files to endowments and transactions.
- Allow institutions to add extended attributes to accommodate their unique needs.

Investment Tracking

The endowment module will:

- Account for investment positions held, including number of shares, book value, par value, market value, CUSIP number, investment category (stocks, bonds, real estate, etc.), and capital commitments.
- Record purchases and sales of investments; income earned, collected, and accrued; management and custodial fees and commissions; and other investment-related data.
- Compare investment policy allocation targets to actual allocations.
- Capture investment commitments for limited partnerships and contributions made against these commitments.

- Electronically store policies and legal documents by investment manager.
- Provide a batch process to feed all investment transactions (summarized or detailed) to the general ledger. Note, however, that institutions are responsible for developing the actual interface to transmit and/or receive data between the Kualu Endowment Module and the general ledger.
- Reconcile balances on the general ledger to details in the Kualu Endowment Module.
- Enable each organization to specify a file design to accept the interface from an outside pricing source in order to update investment market values and other information.
- Allow each institution to set the gain or loss calculation of investments (pools or specific securities) at the individual endowment or trust level to one of four methods—last-in-first-out, first-in-first-out, average book value, or tax lot.

Investment Participation

This module will offer management and reporting capabilities for both endowment and non-endowment investment participation, including unitized transactions. Specifically, the module will:

- Capture and maintain investment pool data (number of units, market value per unit) for all funds that participate in an institution's investment pool(s). This functionality will systematically determine the number of units purchased when funds are received and calculate the gain or loss on withdrawal when units are redeemed.
- Record investment income, realized gains and losses, unrealized gains and losses, and fees to the various funds, either in the specific fund or in high-level accumulation accounts.
- Track the net asset balances of endowment and similar funds between their components of historical book value and accumulated earnings and net gains.
- Apply either a spending formula (budgeted) payout or actual income earned on endowment and similar funds and distribute it to one or more funds.

- Provide data required to create stewardship reports for donors.
- Provide a table of historical unit values and spending policy rates by pool to facilitate reporting of multiple-year activity.
- Capture instructions to specify the way unspent income is to be handled.

Budgeted and Actual Income Projections

For pooled funds and separately invested holdings, the Kualu Endowment Module will:

- Project the budgeted payout (based on pooled units and an approved spending policy) or the anticipated actual income based on declared dividends, bond holdings, etc., for the current and subsequent fiscal year.
- Update current year income projections based on the most current income balance and projected income distributions for the next twelve months.
- Capture spending policy and actual income data by individual endowment fund, college, department, etc.
- Calculate and display estimated income and remaining payout for a current and/or future fiscal year.

Access to Donor Information

Access to donor information and instructions is critical to good stewardship and ensuring compliance with donor intent. To provide appropriate access to information, the system will:

- Capture donor information and other documentation for a gift or endowment fund.
- Create formal table structures to record data related to endowment funds. Data stored will include donors to individual funds, types of split-interest agreements (CGA, CRUT, CRAT, PLIF, etc.), the unit responsible for administering the fund, the unit benefitting from the fund, and other data elements.

- Create formal table structures for capturing criteria on scholarships first and then other fund types (professorships, prizes, etc.).

Beneficiary disbursement process and information (tax) reporting

Support for the disbursement process and tax reporting will include:

- A recurring transaction and disbursement system to pay external beneficiaries of split-interest agreements.
- The ability to create annual reports for the external party's tax information.

Standard Reports

The Kualu Endowment Module will have a well-defined data base to facilitate reporting. However, it will neither provide nor recommend a reporting tool for specialized reporting because different institutions prefer to use different tools for this purpose. This approach is in keeping with that used throughout the Kualu Financial System.

The following standard endowment reports will be delivered with the system:

- Endowment Asset Statement
- Endowment Transaction Statement
- Endowment Transaction Summary
- Non-Endowed Asset Statement
- Non-Endowment Transaction Statement
- Non-Endowment Transaction Summary
- Trial Balance

All reports may be run for organizational entities or sequences (including department, division, school, campus, etc.). The trial balance report may also be run by endowment or account type. Additional internal reports and other reports needed by an institution will be run at the institution using its preferred reporting tool.

System Architecture and Tools

System Components

The modular design of the Kuali Financial System includes a base system of Chart of Accounts, General Ledger, Financial Transactions, Reporting, and Workflow. Additional modules that can be implemented as an institution identifies a need include: Accounts Receivable, Budget Construction, Capital Assets Management, Contracts and Grants, Effort Certification, Labor Distribution, and Purchasing/Accounts Payable.

Kuali Rice, which underpins the Kuali Financial System, is a very robust and broad set of tools for building and deploying a variety of enterprise applications rapidly, with enterprise consistency, and with reliability. Rice includes several components, each of which is described below.

Kuali Enterprise Workflow (KEW)

Kuali Enterprise Workflow (KEW) provides a common routing and approval engine that facilitates the automation of electronic processes across the enterprise. This workflow product was built by and for higher education, so it is particularly well suited to route mediated transactions across departmental boundaries. Workflow facilitates distribution of processes to the organizations within an institution, and these distributed processes eliminate both paper processes and shadow feeder systems.

In addition to facilitating routing and approval, Workflow can also be used to automate process-to-process flows. Each process instance is assigned an identifier that is unique across the organization. Workflow keeps a permanent record of all processes and their participants for auditing purposes.

Kuali Nervous System (KNS)

The Kuali Nervous System (KNS) is a software development framework that allows developers to quickly build web-based business applications in an efficient and agile fashion. For more information, see the description of the Kuali Nervous System under *Technical Tools, Development Tools* above.

Kuali Identity Management (KIM)

Kuali Identity Management provides central identity and access management services. It also provides management features for identities, groups, roles, and permissions—and for the relationships among them.

All integration with Kuali Identity Management is through a simple and consistent service API (Java or Web services).

Kuali Identity Management services are implemented as general-purpose solutions that can be leveraged by both Kuali and non-Kuali applications. These services are designed to allow institutions to "swap out" the reference implementations for custom implementations that integrate with other third-party identity and access management solutions. Services may be swapped out independently of each other. For example, many institutions have a directory solution for identity but may not have a central group or permission system. In such cases, the identity service implementation may be replaced while the reference implementations for other services remain intact.

Kuali Service Bus (KSB)

The Kuali Service Bus (KSB) is a simple service bus geared toward easy service integration in a service oriented architecture (SOA). It offers message-driven service execution, synchronous or asynchronous messaging, queues, service discovery, fail-over reliability, persistent callbacks, etc. All modules in the financial system communicate in real-time using the Kuali Service Bus. This communication usually takes the form of querying other modules for information about users, roles, accounts, budgets, etc.

Kuali Enterprise Notification (KEN)

Kuali Enterprise Notification (KEN) acts as a broker for all university business-related communications by allowing end users and other systems to push informational messages to the campus community in a secure and consistent manner. All notifications are processed asynchronously and are delivered to a single list in which other messages (workflow-related notifications, etc.) also reside.

End users have the option of specifying that certain types of messages be delivered to email, mobile phones, and other end points.

Architecture Integration

Integration Within/Between System Modules

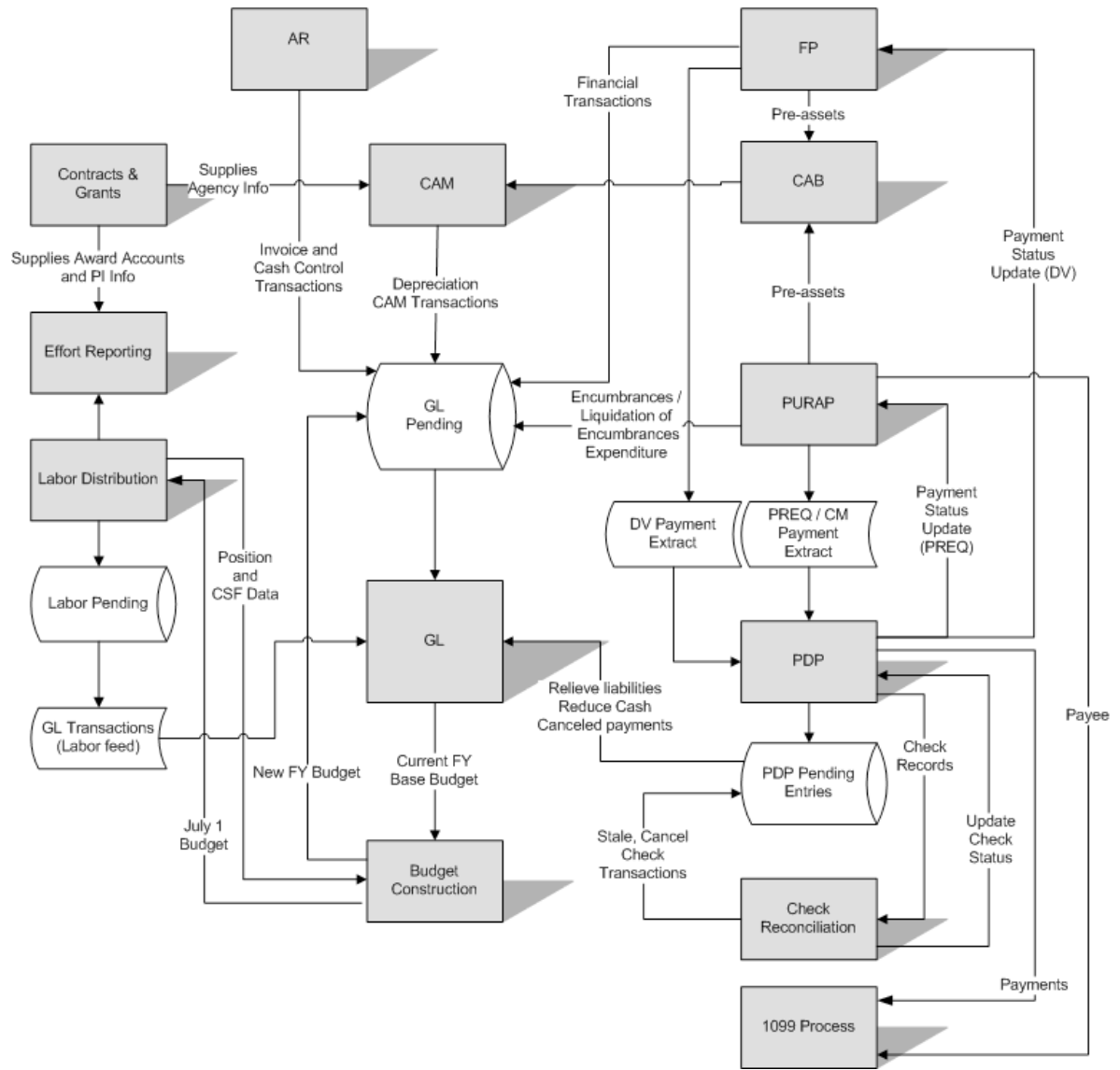
The modules in the Kualu Financial System are highly integrated but loosely coupled using the Kualu Service Bus, so institutions can easily replace modules, rules, or services without affecting core code.

Individual modules of the Kualu Financial System share data. For example:

- General Ledger (GL) and Financial Transactions: Financial transactions send real-time entries to the GL Pending Entry table.
- General Ledger and Purchasing System/Accounts Payable: Purchasing/Accounts Payable sends real-time entries for purchase orders and payment requests to the GL Pending Entry table for establishing encumbrances and liquidating encumbrances, respectively.
- General Ledger and Labor Distribution: The Labor Distribution module creates a batch file of general ledger transactions that is processed by the General Ledger Scrubber and Poster job.
- General Ledger and Capital Asset Management (CAM): The Capital Asset Management Depreciation batch job saves pending entries into the General Ledger Pending Entry table.
- General Ledger and Pre-Disbursement Processing (PDP): The Pre-Disbursement Processing batch job feeds Pre-Disbursement Processing pending entries to record general ledger transactions.
- General Ledger and Budget Construction: The Budget Construction job extracts base budget from the general ledger for use in preparing budget for the new year. The Budget Construction batch job feeds the new year budget to the general ledger.
- Purchasing/Accounts Payable and Capital Asset Management: The Capital Asset Builder process pulls pre-assets from payment requests.
- Financial Transactions and Capital Asset Management: Asset information in financial transactions is captured by the Capital Asset Builder.

- Pre-Disbursement Processing and Purchasing/Accounts Payable: A batch job extracts payments from Purchasing/Accounts Payable. A Pre-Disbursement Processing job updates the payment status in the payment request.
- Pre-Disbursement Processing and Financial Transactions: A batch job extracts payments from disbursement vouchers. A Pre-Disbursement Processing job updates the payment status of the disbursement vouchers.
- Pre-Disbursement Processing and Check Reconciliation: A batch process extracts payments from Pre-Disbursement Processing and compares them to records in the check file from the bank.
- Pre-Disbursement Processing and 1099 application: A batch process extracts payments from Pre-Disbursement Processing and extracts payees from Purchasing/Accounts Payable vendors.
- Labor Distribution and Effort Reporting: The Effort Reporting batch job reads the labor ledger data and pushes the effort reporting e-docs via workflow. The Effort Reporting e-doc automatically generates electronic salary transfer documents.
- Labor Distribution and Budget Construction: The Budget Construction batch job extracts position and appointment funding information from the Labor Distribution module.
- Contracts and Grants and Chart of Accounts: Attributes necessary for post-award processing (indirect cost recovery rate, type, and accounts) are stored in the accounts.
- Contracts and Grants and Effort Reporting: Effort Certification e-docs are routed based on the principal investigator and account definition on the Award table.
- Contracts and Grants and Capital Assets: Agencies are tracked in the Asset table.

The diagram below illustrates integration between modules in the Kualu Financial System.



Integration with External Systems

Implementing institutions have integrated the Kuali Financial System with a wide variety of systems (human resources, student systems, etc.). These integrations are customizations undertaken by each institution on an as-needed basis and are not part of the base Kuali Financial System project.

Given the current high level of interest in both SciQuest and Kuali Coeus, we offer the following general information on integration with these systems.

Kuali Coeus to Kuali Financial System (planned functionality)

The initial phase of Kuali Coeus integration with the Kuali Financial System is planned for Kuali Financial System 4.0 (and Kuali Coeus 2.0) in December 2010. Supplemental information will be defined in the Contract and Grant Account Default table to create an account in the Kuali Financial System. New account e-docs will then be automatically generated from Kuali Coeus Award e-docs.

Budget adjustment transactions will be fed from the Kuali Coeus award budget (planned for Kuali Coeus 4.0 in summer 2011).

Other integrations planned beyond release 4.0 will:

- Obtain the Kuali Coeus project director for the Kuali Financial System account.
- Determine whether the Kuali Financial System account is awarded by a Kuali Coeus federal agency.
- Obtain the following Kuali Coeus proposal/award fields for Kuali Financial System account inquiry: Proposal Number, Project Director, Proposal Federal Pass Through Indicator, Federal Pass Through Agency Indicator, Grant Number, Agency Reporting Name, Proposal Begin/End Date, Proposal Total Amount, Direct Cost Amount, Indirect Cost Amount, Proposal Rejected Date, Proposal Last Update, Proposal Due Date, Proposal Total Project Amount, Proposal Submission Date, Old Proposal Number, Proposal Closing Date, Proposal Award Type Code, Proposal Status Code, Proposal Fellow Name, Proposal CFDA Number, Proposal Purpose Code, Proposal Project Title, Proposal Active Indicator.
- Validate and look up the Kuali Coeus agency number for the Kuali Financial System asset.
- Look up and validate the Kuali Coeus CFDA number for the Kuali Financial System account.
- Get the Kuali Coeus CFDA Program Title and CFDA Maintenance Type ID values for the Kuali Financial System account inquiry.
- Look up and validate Kuali Financial System accounts for Kuali Coeus budgets and awards.

Purchasing/Accounts Payable and SciQuest Integration

Each implementing institution works with SciQuest to set up attributes specific to the institution's needs. After setup is complete, users access the SciQuest site from the Kualu Financial System menu. When shopping is complete, cXML is transmitted from SciQuest back to the Kualu Financial System for requisition processing. Beyond that point, standard Kualu Financial System Purchasing/Accounts Payable workflow occurs.

Technical Tools

Integration tools

Integration involves many different components, all of which are supported through the Kualu Financial System's Service Oriented Architecture (SOA).

Authentication

AuthN, which is accepted by the Kualu Identity Management component (see *System Components* above) of Kualu Rice, may be used as-is to store user information in the database. Some institutions choose to use this approach as their default solution, but most prefer to integrate with an external authentication system. Typically, this external system exposes a Lightweight Directory Access Protocol (LDAP) interface. Today, LDAP integration is in production at all Kualu Financial System implementing schools and has been accomplished via technically simple XML exchanges. Other institutions are currently working on Kerberos as an alternate AuthN provider.

Authorization

AuthZ customization may include the federation of role, group, permission, and responsibility data. Currently, most implementing institutions are using the Kualu Identity Management tools (see *Other Technical Considerations* below) delivered with the base Kualu Financial System for AuthZ, but this service can easily be overridden to work with external tools. Several institutions are considering use of Grouper

(<http://www.internet2.edu/grouper/>) or another similar tool as a replacement for the built-in group service.

Batch integration

The most often-used form of integration is through batch processing. For decades, most campuses have relied on external systems to export data on a regular (nightly) basis for consumption by their financial systems. The Kualu Financial System provides a simple and effective mechanism for handling feeds of external data from these systems by opening drop boxes for the different types of incoming data (general ledger data, checks, requisitions, procurement card data, etc.).

In addition, the Kualu Financial System can be easily configured to read in the batch files at any time. While most institutions use a nightly schedule, doing so is not required. Batch updates can easily be set to occur on a custom schedule to meet local needs.

Note: The Kualu Financial System provides a straightforward and intuitive user interface for uploading batch files and provides other graphical user interface (GUI) screens for working with batch data and reports.

Service Bus

The Kualu Financial System is based on Kualu Rice, which includes an enterprise service bus. This bus allows all Kualu services to be easily exposed as web services for remote systems (especially non-Java systems) or used in other Java applications using the Rice "thin client." Services that are ideal for exposing on the bus include those that validate or retrieve financial data.

Development Tools

Different development tools are used for customizing and adding functionality within the Kualu Financial System and for integration development.

Tools for Customizing or Adding Functionality

The Kualu Financial System has been designed with great care to ensure that business rules and other critical functionality can be changed without complicating financial system upgrades.

Any Java IDE may be used to customize or add functionality. To date, the open-source Eclipse multi-language software development environment has been the tool of choice of the Kualu community. Although each institution may use any Java development tool it prefers, the use of Eclipse allows institutions to more easily take advantage of tools and techniques used by the community.

Other tools are now being developed to make the Kualu Financial System customization process even simpler by providing graphical user interface front ends. As more institutions implement the system, this tool set will become very rich.

Tools for Integration Development

Integration development may be undertaken on any environment because the interface to the Kualu Financial System is a simple web services application programming interface (API). Prototyping efforts have already shown that an external .NET application can be integrated with the Kualu Financial System in a matter of hours. These prototypes are now being placed into production.

A key advantage of the Kualu Financial System is Kualu Rice—the system's underlying middleware and application development framework. One part of this framework—the Kualu Nervous System (KNS)—provides a robust software development framework that speeds development and ensures enterprise consistency. This nervous system is an abstracted layer of "glue" code that enables developers to dynamically generate user interfaces through which end users can search, view details about records, interact electronically with business processes, and perform other activities.

The nervous system allows developers to build new enhancements, modules, and even independent enterprise applications that easily integrate with the Kualu Financial System and other Kualu applications. At many institutions, technical staff members use KNS to create new Kualu Financial System e-docs and amend existing e-docs in a consistent,

controlled, and well-documented manner. The nervous system provides easy interfaces into a number of tools—including data dictionary, data lookup, notes and attachments, custom attributes, data encryption, identity management integration (permissions and responsibilities), and workflow integration.

Use of the Kualu Nervous System brings visual, functional, and architectural consistency to any system that is built with it. This consistency ensures that the resulting software is easier and more efficient to maintain.

Reporting Tools

Kualu Financial System reporting tools are specialized for different functions of the system.

- System logs and batch processing reports may be easily accessed through the system's menu- and screen-driven administration interface. These reports are usually run by a very senior member of the accounting team who can resolve issues found in the reports and/or communicate information to others as appropriate.
- Real-time financial information is available on many screens in the system. These screens provide multiple views of general ledger and labor balance information and display reports specific to other Kualu Financial System modules. Users may export the data in CSV, XML, and spreadsheet format.
- The out-of-the-box system includes samples of standard financial and other reports (including trial balance and account status) that institutions may alter and run as needed.

The reporting tools delivered with the system are not intended to meet all reporting needs for all institutions. Instead, data reporting is most often handled through a mixture of external reporting tools and data warehousing. The particulars of each institution's solution are very specific to the institution, its needs, and its enterprise data warehousing perspective. Before adopting the Kualu Financial System, institutions often have a reporting tool in place, have highly customized reporting requirements, and have already created highly customized reports. Many

of these existing reports can simply be altered to reflect the Kuali Financial System data structure.

The chart below summarizes the reporting plan at a sampling of Kuali Financial System institutions.

Institution	Reporting/BI	Modeling	ETL	Metadata Management	DBMS	Scheduler
University of Arizona	OBIEE+	DeZign	IBM DataStage	OBIEE, InfoLibrarian or Metadata Workbench	Oracle	Control M
Indiana University	IUIE / SQR / BIRT*		Informatica Power Center	IUIE	Oracle 10g	Informatica PowerCenter, IUIE, TNG
Michigan State University	Cognos	ERWin	IBM InfoSphere DataStage	IBM InfoSphere DataStage	Oracle 10g	UC4
Cornell University	OBIEE+	ModelRight	IBM Cognos		Oracle 10g	
University of Hawaii	Cognos					
Iowa State University	Cognos				MS SQL	
SJDC (production)	Cognos		Custom PL/SQL	Cognos	Oracle 10g	
CSU (production)	Jasper reports eThORITY				Oracle	

Note: rSmart delivers the open source Pentaho reporting and business intelligence (BI) tool to its customers.

Data Import/Export Tools

The following import and export tools are available in the Kuali Financial System.

- On standard lookup and inquiry screens, export in XML/CSV/XLS format is available from the search results screen.
- On financial transaction e-docs, CSV file import is available for accounting lines.

- In the Budget Construction module, CSV file import is available for bringing budget into the Budget Construction e-doc. Additionally, import of union data in CSV format is supported.
- In the Purchasing/Accounts Payable module, CSV file import is available to load line item and account data.
- In the Pre-Disbursement Processing module, Payment XML Upload loads payment data. Additionally, Federal Reserve Bank XML Upload loads ACH bank routing numbers.
- In the general ledger, Collector XML Upload and Flat File Upload load entries into the general ledger.
- In the Accounts Receivable module, Customer XML Upload loads new customers from any external system. For example, the University of California, Davis uses this functionality to import customers from its veterinary medicine patient care system.
- Also in Accounts Receivable, the accounting line CSV import feature mentioned above has been customized to include customer invoice line items. Such line items include all standard accounting line data elements plus invoice elements such as, quantity, unit-of-measure, item description, unit price, and taxability of the item. This additional feature facilitates the creation of long or complex invoices without large data entry workload.
- In Financial Transactions, Credit Card Data XML Upload loads procurement card transactions.
- In the Purchasing/Accounts Payable module, Electronic Invoice XML File Feed loads vendor invoices.
- Document Type, e-Doc Lite, and Workflow rules provide XML ingestion (both automated and manual), which allows the system to ingest custom e-docs.
- In the Financial Processing module, Disbursement Voucher Batch Upload loads disbursement vouchers from an external system. Note: This functionality was developed collaboratively by several Quali partners and is supported by rSmart and will be contributed to the base product.
- In the Purchasing/Accounts Payable module, Purchase Order Batch Upload loads purchase orders from an external system. Note: This

functionality was developed collaboratively by several Kuali partners and is supported by rSmart.

Other Tools

Flexibility built into the Kuali architecture allows different institutions to use different operating systems, application servers, and database platforms. Each institution is free to use the tools its staff is most familiar with.

Because the Kuali Financial System is an open source J2EE project, many other J2EE tools are freely available for use with the system. These tools that can help with the development, deployment, and profiling of the application. Among the tools that have already been used by the Kuali Financial System project team are JUnit for unit testing, JMeter for stress testing, Yourkit for application profiling and Hudson for continuous integration.

The following lists provide examples of open source and proprietary tools used for various components of the Kuali Financial System infrastructure.

Application server tools:

- Tomcat 5.x
- Tomcat 6 (in testing)
- Glassfish
- JBoss

RDBMS tools:

- Oracle
- MySQL
- DB2 (in testing)

Version control tools:

- SVN

Java tools:

- Eclipse
- IntelliJ
- Ant
- Maven

- Hudson

As noted previously, the Kuali Financial System is based on Kuali Rice. Therefore, after an institution's staff understands how the financial system works, it can easily transfer that knowledge to other applications, including enterprise resource planning (ERP) systems and other tools used on campus. All of the following tools (some of which are in production, while others are in development) directly take advantage of Rice infrastructure and can be easily integrated with the Kuali Financial System:

- Time and Attendance
- Travel
- Tool to automatically turn any PDF form into an online routable e-doc
- e-Doc Lite (tool to create lightweight e-docs using simple XML)
- Class overloads

Dozens of other tools based on the Rice infrastructure are also in development.

Planned Tools and Tool Enhancements

A detailed [online roadmap](#) is available for the underlying service oriented architecture, tools, and application development framework. This roadmap includes [release plans](#) as well as a detailed description of the roadmap development process. Prioritization of changes, improvements, and fixes for inclusion in each release is determined by the community's technical and functional councils, each of which is made up of a cross-section of Kuali Financial System project partners.

Technical Administration

Because the Kuali Financial System is primarily a database-driven system, each institution handles archiving through its own database tools. However, most implementing institutions choose not to archive old data: they simply keep it. For example, Indiana University has been running its system for over a decade, and its Oracle database is only on the order of tens of gigabytes. (Note: The Kuali Financial System is based on Indiana University's code, so this institution did not need to erase old data.)

In general, institutions handle backups through two mechanisms. First is a set of common database backup routines that usually fall under standard university practices. Second is backup of the file store where attachments are held. Most institutions have appropriate backup systems and routines in place. Nothing special is required for the Kualu Financial System.

High availability is a requirement for every institution's financial system. Because these systems are complex, they have more potential failure points and are more difficult to implement correctly than are simpler systems. The most highly available complex systems adhere to a simple design: a single, high quality, multi-purpose physical system with comprehensive internal redundancy running all interdependent functions, paired with a second, like system at a separate physical location.

Although most institutions are not comfortable hosting financial data off site, the basic tenets of high availability design apply even when the backup systems are within the control of the university's Information Technology unit. Typically, the recommendation is to have clustering for all tiers—load balancer, web server, application server, database, file system—to provide for system failover and to improve performance.

Catastrophic system problems may occur in rare situations (for example, after a natural disaster or other devastating problem has occurred). It is imperative that each institution have a disaster recovery plan to rebuild its systems should such a situation develop. This plan must include all processes, policies, and procedures related to preparing for recovery or continuation of technology infrastructure critical to the financial system.

Successful disaster recovery depends on both an institution's backup methodology and the use of high-availability architecture. Most problems are addressed by having redundant hardware, but when a problem is truly disastrous it calls for rebuilding a system. To quickly rebuild a Kualu Financial System instance, the institution must have high-quality version control so the code can be quickly redeployed to a new server.

Version control, however, is only one part of recovery. The next step is recovering data and files. Both should be protected by a solid backup strategy. At a minimum:

- Institutions should perform nightly backups and maintain them for at least two weeks.
- Institutions should hold weekly backups for at least one year.

- Where intra-day information is critical, institutions should have an offsite and real-time database backup solution.

Note: Oracle provides technology (such as Flashback and Recovery Manager) that meets these needs.

System Administration and Monitoring Tools

Many monitoring tools on the market work very well with the Kualu Financial System. To date, most implementing institutions have been using the open-source Nagios platform. Nagios is a robust and flexible monitoring solution that has become the de facto standard for web application monitoring. It has a very large array of plug-ins for monitoring and responding to events in all Kualu Financial System servers (database, application server, web server, load balancer, file servers, etc.).

For example, Nagios provides comprehensive plug-ins for monitoring various systems, such as:

- Applications
- Services
- Operating systems
- Network protocols
- System metrics
- Infrastructure components

Nagios also provides a wide array of notification schemes:

- E-mail
- SMS
- Phone
- Pager
- Windows popup messages
- Instant Messaging
- Audio alerts

Finally, Nagios can also help prevent issues by providing reporting around trending, capacity, and issue history.

Two informative whitepapers describe how Nagios is used to monitor and help prevent issues in highly available and redundant systems. These whitepapers are available at:

- <http://bit.ly/cx7z9L>

- <http://bit.ly/aeqsb>

Although Nagios is the most commonly used monitoring system, it may be replaced according to institutional preference.

The Kualu Financial System itself has built-in monitoring processes for the Kualu Service Bus (KSB) and the Kualu Enterprise Workflow (KEW) engine. These internal and external monitoring tools have facilities to notify administrators using a variety of communication protocols.

Other Technical Considerations

Because the Kualu Financial System is a community source product, participating institutions are free to add functionality developed in-house or by others, and they are free to adapt this functionality to meet their needs. In many systems, such changes make system upgrades far more complex and costly. In the Kualu Financial System, however, the technical underpinnings allow institutions to modify and replace components—everything from an individual service to a complete module—without compromising the system upgrade path.

When an institution adopts the Kualu Financial System, its in-house developers (if any) do not need to work in a silo. Instead, they can take advantage of the expertise of the entire Kualu community and that of other open source communities. In-house developers can readily obtain examples, source code, guidance, and problem-solving assistance from other developers who have faced similar challenges.

The Kualu Financial System and Kualu Rice are based on a collection of industry-standard technologies and components, many of which will be familiar to newly hired developers. This familiarity greatly reduces the technical learning curve and, consequently, the need for training, for new developers.

Kualu Financial System Support

The community source model* provides great flexibility with regard to services and support. Because software development has been decoupled

* For information about the community source model, the Kualu community, and rSmart's participation in this community, see Appendix A.

from implementation and support, institutions have choices unlike those available with the proprietary software model.

For the Kualu Financial System, each institution has two potential sources of ongoing support and maintenance—self support and commercial support. Both options leverage the strength of the Kualu community.

The information below describes the support provided by the Kualu community and support options offered by companies like rSmart—that is, companies that offer support and maintenance for a fee. Note: Additional detail about the rSmart support subscription is available on the company's [web site](#).

Fixing Software Defects and Making Enhancements

Three groups—the Kualu Financial System project team, implementing institutions, and companies providing service to Kualu Financial System customers—contribute fixes and enhancements to the community.

The Kualu Financial System project team allocates hundreds of hours during each release cycle for fixing software defects, improving performance, and making enhancements. In general terms, the process is as follows:

1. Lead functional subject matter experts (SMEs) and a group of SMEs representing each Kualu Financial System partner institution work together to prioritize work within the modules they are responsible for.
2. A committee (made up of representatives of project partners) collects input from step 1 and prioritizes the work across all modules.
3. The project team works on the highest-priority items first.
4. The project team periodically produces maintenance releases that include improvements made to date.

Companies that offer commercial support for the Kualu Financial System complement the community process by offering a service-level agreement to support, troubleshoot, and resolve issues in a timely fashion based on the severity of the issue. Client institutions submit support requests to the support company, which then troubleshoots and resolves issues.

Depending on the severity of a particular defect, the company may provide a patch for it or include the fix in the next maintenance release.

Support companies prioritize and work on enhancement requests from their clients in a similar way.

As noted above, implementing institutions also fix defects and develop enhancements.

Issue Resolution and Enhancement Process

When issues arise with the Kuali Financial System software, institutions may rely on community support, commercial support, or both. If an institution is using a self-support model, its staff may work on a problem independently and, at any point, may engage the Kuali community for assistance with troubleshooting and resolving issues. If an institution has engaged a company for support, its staff may work with the Kuali community and with its commercial support vendor.

Both the community support process and the vendor support process are described below.

Community Support Process

The community support process includes the following steps.

1. Reporters send an email to the [functional](#) or [technical](#) collaboration group asking for input and/or verification that the issue exists in the Kuali Test Drive and Kuali Financial System test regression environments. This step allows staff to verify that the problem is not the result of a configuration issue at the reporting institution.
2. If the issue can be reproduced on the environments mentioned above, the reporter enters an issue in the public JIRA project for the Kuali Financial System.
3. The Kuali Financial System quality assurance manager confirms that the issue has not already been reported and moves it to the Kuali Financial System Development project.
4. The issue is assigned to the affected module's lead subject matter expert, who confirms that the functionality is a defect or determines that the system is behaving as designed. If the behavior is a defect, he or she assigns a priority and specifies the version of the system in which it will be fixed (either the current fix version or a future fix

version). Blocker-level bugs are assigned to developers to work on immediately.

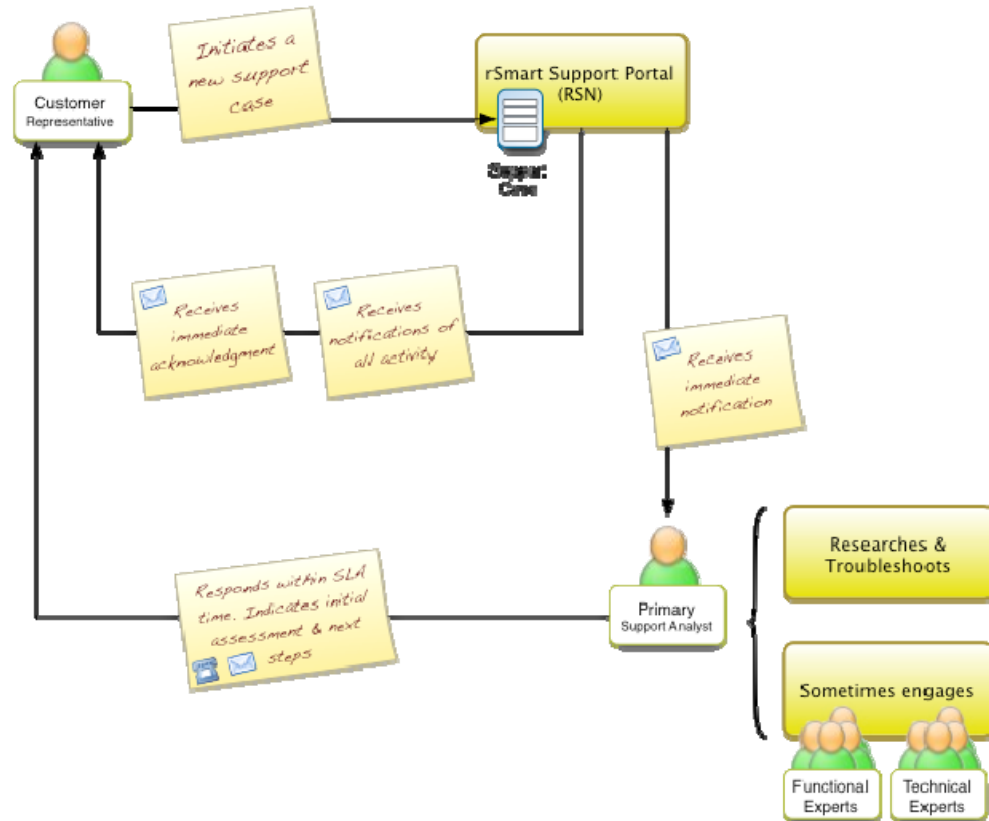
5. After the change has been made, *either* it is made available for pick up in the subversion environment *or* (if the bug fix is made by the discovering institution) it is either attached to the reported issue in JIRA or, if the institution has "trusted" developers, it is contributed to the core code for the next release.

Commercial Support Process

Note: For the sake of example, rSmart's support process is described below. Other companies' support processes may vary. An important strength of the community source model is that no one vendor can "lock in" an institution as it can with proprietary software.

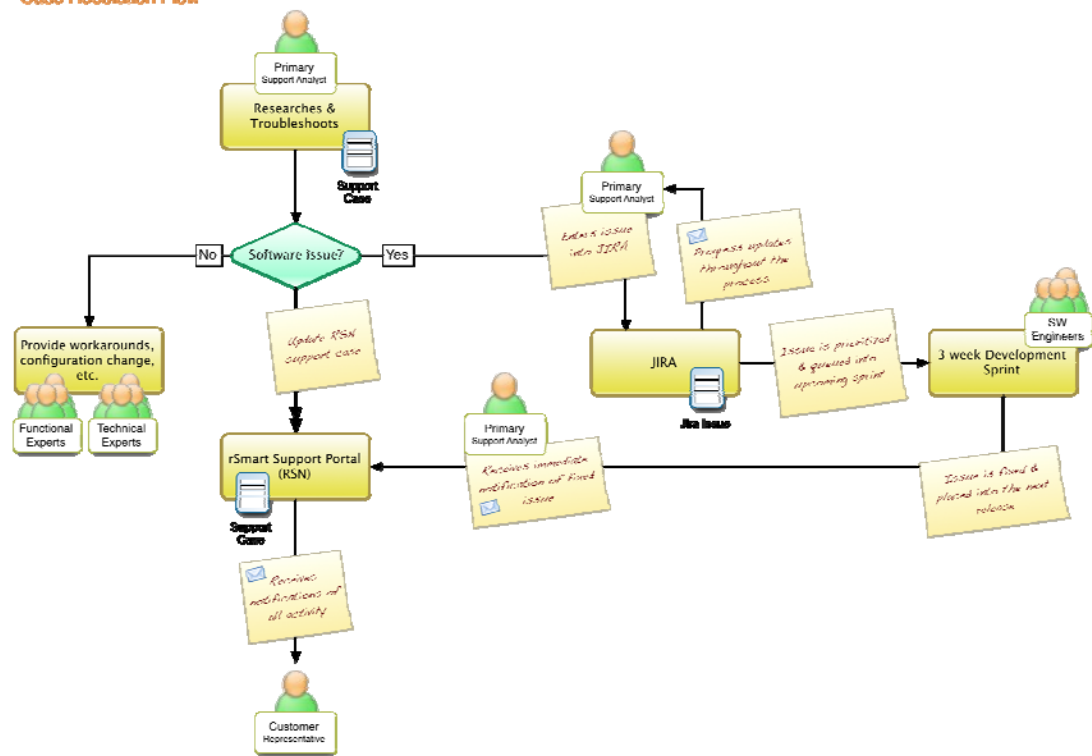
The figure below depicts the company's typical process when a new support case is initiated.

Case Initiation and Initial Response



The figure below depicts at a high level the activity flow for resolving support cases of normal severity. High severity cases that impact production follow a similar flow but may result in a software patch being developed outside the normal development process.

Case Resolution Flow



Releasing New Versions of Software

New software releases are typically planned and executed on an annual basis with a release target in the fourth quarter of the calendar year.

The development and release process is as follows.

1. Kualu Financial System project partners* submit enhancement suggestions.
2. Subject matter experts for each module prioritize the suggested enhancements for their module and submit a ranked list to the Kualu Financial Functional Council.

* For information on the nature of this partnership, see Appendix A.

3. The Functional Council (which is made up of project partners) prioritizes enhancements across all modules based on the development team's capacity.
4. The Functional Council returns the selected enhancement suggestions to the appropriate subject matter experts, who write functional specifications.
5. The technical team develops the enhancements based on the specifications.
6. The Kualu Financial System quality assurance manager coordinates testing by groups of subject matter experts from project partner institutions.

Release 4.0

Release 4.0 of the Kualu Financial System, which is scheduled for release October 2010, will include the following enhancements:

- Kualu Endowments Module
- Kualu Coeus-to-Kualu Financial System integration for account creation and budget loading
- Performance tuning and technology optimization

Release 4.0 will also include enhancements developed through the cooperative enhancement process described under *Fixing Software Defects and Making Enhancements* above.

Support Philosophy for Older Releases/Versions

A core principle of the Kualu community is "no disruptive upgrades." Consequently, institutions are free to upgrade if and when it suits them, without pressure to take unwanted upgrades.

The community has not yet established a firm policy on supporting past releases. It is likely, however, that the Kualu Financial System project will support the current release and the release previous to it. Upgrade scripts will be provided for the current and previous release.

A key difference between these practices and the typical vendor practices is that each institution is free to choose how long to use Kuali software and may stop using it at any time.

Maintaining Product Compliance with Federal and State Regulations

The Kuali community is committed to compliance with federal regulatory changes. Both the Kuali Functional Council and appropriate subject matter expert groups discuss compliancy issues as needed in order to ensure that they are addressed in a timely manner. Necessary code changes are given top priority. Depending on the requirement, any given change may be made available in either a maintenance release or the next major release. If needed, a patch is provided.

For institutions that self-support, state regulations are the responsibility of the institution affected. Institutions within the same state are encouraged to collaborate with each other to make the required change(s) and add them to the Kuali Financial System Project's contributions page so others may download them.

rSmart will collaborate with its customers and commit to making state regulatory changes as needed in the Kuali Financial System. These changes will be provided using the standard development and release practices and may be distributed in patches, maintenance releases, or major releases.

Annual Support Fees

There is no fee for peer community support. Anyone may submit questions/issues to the Kuali community email lists. Response from and resolution by this forum are not guaranteed, but the community is typically very responsive.

rSmart's subscription support and maintenance pricing varies based on the modules implemented and the size and complexity of an institution as measured by its annual revenues. For more information about rSmart's support for Kuali software, visit [the company's website](#).

Staffing for Effective Support

The number of FTEs recommended to support the Kualu Financial System in production depends in part on an institution's chosen form of support—commercial support, self-support, or some combination of the two.

Range of Technical Resources by Role

Information in this section is provided based on the premise that an institution engages commercial support to supplement its campus team. The roles and FTE estimates in the table below are for the campus team only and are for production support only. Institutions that become investing partners in the Kualu Financial System Project must assess the resource requirements for this participation separately from those for production maintenance and support.

Roles	Low	High	Comment
DBA	.1	.1	
Application Maintenance Developer / Analyst	.5	1	This individual provides regular support for the campus user community, troubleshoots and solves integration issues, manages batch jobs, and is the primary interface to engage commercial support resources.
Analyst/Designer	0	0	
System Administration	.1	.1	
Security Administration	.1	.1	

Range of Functional Resources by Role

Information in the following table is provided based on the premise that an institution engages commercial support to supplement its campus team. The roles and FTE estimates in the table below are for the campus team only and are for production support only. Institutions that become investing partners in the Kualu Financial System Project must assess the

resource requirements for this participation separately from those for production maintenance and support.

Roles	Low	High	Comment
Finance			
Lead	0.5	1.0	This individual will play a dual role as lead/analyst. Finance includes Budget, Labor Distribution, COA, General Ledger, and C&G
Analyst/Specialist/SME	0	0.5	
Procurement			
Lead	0.5	1.0	This individual will play a dual role as lead/analyst
Analyst/Specialist/SME			
Budget			
Lead	0	0	Counted in Finance
Analyst/Specialist/SME			
Payables and Receivables			
Lead	0.5	1.0	This individual will play a dual role as lead/analyst
Analyst/Specialist/SME			
Other			
Asset	0.2	0.5	The individual will play a dual role as lead/analyst

The estimates above will vary depending on the degree of customization.

Recommendations from Early Adopters

One of the unique benefits of adopting the Kualu Financial System is taking advantage of the extensive sharing that occurs among designers, developers, and users.

Three of the first North American institutions to go live with the Kualu Financial System—Colorado State University, San Joaquin Delta College, and the Naval Postgraduate School—shared a great deal of helpful information in *The Kualu Financial System Keys to Success Guide*. A few of the tips and recommendations shared in that guide are reproduced below. This guide is available in its entirety on the [rSmart web site](#) as a free download in PDF format.

Implementation Recommendations

The Colorado State University (CSU) implementation team provided these suggestions:

- Strike a balance between using the system in new ways and changing processes.
- Review business theories and practices to minimize system impacts.
- Time and prioritize scope of new system implementations to reduce project risk.
- Go live with the system at the start of the fiscal year. This allows time to troubleshoot issues early in the year and prevents resources being wasted in the effort to maintain two systems.
- To reduce implementation risk, develop a strong partnership with a commercial provider that augments resources and Kualu expertise.
- Inform users about system-generated email alerts. It is easy to forget this communication since testing and training systems do not generate alerts.
- Pay attention to the approval hierarchy. Spend time to define it well and add a degree of realism. We [CSU] had some approval overkill that we had to correct.
- Communicate, communicate, communicate. For us [CSU], this meant communicating with our campus constituency, with community

members, and with the commercial vendor we selected. Having open communication with and full support of our president and board were critical.

The San Joaquin Delta College implementation team offered these suggestions:

- Create a thorough and comprehensive fit-gap analysis as you begin implementation. It is essential to have a perspective for what must be done and how the pieces will come together to complete the implementation.
- Create resource contingency plans from the beginning. If a critical staff member were to leave, or the state were to experience an unprecedented fiscal crisis, what then?
- Teach functional project team members how and when data manipulation can be easily automated. This prevents time being wasted with manual data entry or clean-up that could have been automated.
- Engage a commercial partner. We absolutely could not have implemented Kuali without the assistance of our commercial partner.

The Naval Postgraduate School (NPS) offered the following additional suggestions:

- If it is critical to provide a safety net for data (which, in the case of NPS, had to be provided to the federal government), consider running parallel processing of the Kuali Financial System and the legacy systems for one budget cycle. This approach engages the campus community in the Kuali Financial System as quickly as possible while providing a comfort zone for functional staff and ensuring the requisite safety net.
- Use the Proof of Concept* as an opportunity to re-evaluate your existing business processes for effectiveness and result, to demonstrate the value of the system, and to cement executive buy-in.

* Proof of Concept service allows an institution's users to gain hands-on experience with the Kuali Financial System, using their own data and processes.

- Take full advantage of the Kualu community by gleaning business management best practices from other institutions using the system.
- Use the move to a new system to formalize and improve business practices and to reduce unintended process variance. Configure the system to map to these processes and provide structure to ensure the processes will be followed.
- Don't underestimate the importance of nomenclature. Learn and use the Kualu Financial System terms starting on Day 1.
- Train employees no more than three months prior to implementation, and focus the training on their job responsibilities using their data.
- Create or leverage simple user guides that walk users through each action they will take for every activity.

Support Recommendations

- When Colorado State University went live, the Campus Services organization provided first line support to users. "They are the organization on campus that monitors our financial processes, so they are a logical group to call for help. They had been training and knew how to use the system," explains Controller Lynn Johnson. "Some of our users went directly to Purchasing for help, and that worked as well. Our functional users were able to get answers to their question as they began using the system."
- San Joaquin Delta College set up a help desk to triage issues reported by users. "We do not want the help desk trying to find the right developer in the community to address issues. Our plan is to route the issue to our commercial partner and leverage their understanding of both the system and community to get issues resolved," reports Matt Coombs, Senior Director of Systems Development. "Leaning on a commercial partner for support will allow us the bandwidth to remain engaged in the leadership of the Kualu community, while ensuring excellent service and support for our campus community."

Appendix A: Kualif and rSmart

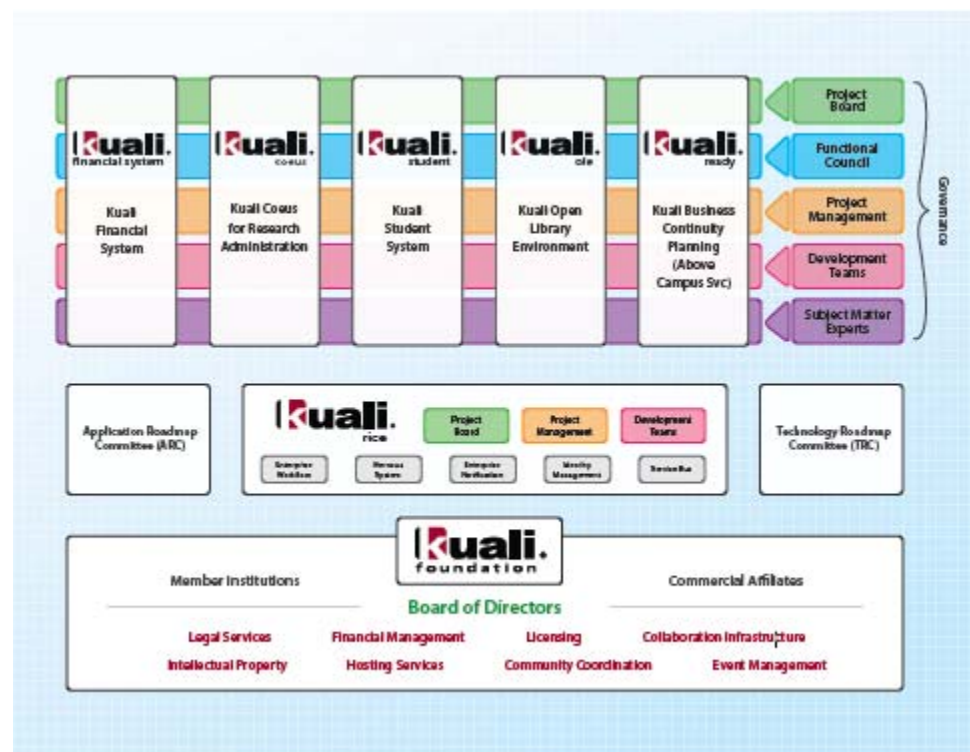
Overview of the Kualif Foundation, Projects, and Community

All Kualif software, including the Kualif Financial System, is developed by the Kualif community—a community of universities, colleges, businesses, and other organizations that are collaborating to build and sustain *open-source administrative software for higher education, by higher education*.

At the heart of the Kualif community is the Kualif Foundation—a not-for-profit organization that holds the community's intellectual property and coordinates the community's efforts by providing collaboration infrastructure, hosting community events, and employing individuals who coordinate the efforts of hundreds of people working for the foundation's member institutions and companies. The foundation's primary source of funding is membership dues.

As of this writing (early 2010), there are over 40 foundation members.

Kualif applications are produced by Kualif's application software projects—Financial, Research Administration, Student, Library, and Business Continuity Planning. These projects are depicted in the figure below.



Each project operates somewhat independently but shares common governance (as shown by the five governance bands running through the projects in the figure above). Kualu Rice provides a consistent application development framework and common service oriented middleware.

Each Kualu application project and the Kualu Rice project are funded and governed by the project's investing partners. Each project has its own investing partners who sustain the development of the software. The [Kualu community website](#) lists the current partners for each of the software projects.

Note this distinction between Kualu Foundation members and Kualu project partners:

- Kualu Foundation members contribute member dues that pay for the Foundation's infrastructure, community events, and staff. Members do not sit on the Kualu Financial Functional Council or participate in SME groups.
- Kualu project partners are foundation members who invest in the development of software for a particular Kualu project. Partner representatives sit on the Kualu Financial Functional Council and participate in SME groups.

Project partners, along with seed funding from the Mellon Foundation, have invested more than \$45 million in the community's projects to date.

rSmart's Role in the Kualu Community

rSmart is one of the founders of the Kualu community, along with NACUBO, Indiana University, and University of Hawaii. The company is a member of the foundation, a commercial affiliate, and an investing partner in the Kualu Financial System Project. rSmart employees are active in the Kualu community in governance roles, on functional councils, in technical leadership, and in the development of software, documentation, testing, and more.

rSmart provides software maintenance, support, and implementation services. Much as Red Hat does for the Linux operating system, rSmart produces a distribution of the Kualu Financial System and provides maintenance and support for it.

Higher Education Focus

Like the Kualu community, rSmart has no organizational focus other than higher education. rSmart has more than 50 people dedicated to supporting higher education, nearly half of whom are working with Kualu software, the Kualu community, and adopting schools.

How Kualu Community Software Is Different

Software developed by the Kualu community stands apart from other administrative software in several ways:

- It is designed *only* to meet the needs of higher education. The foundation serves no purpose other than supporting higher education and has no plans to extend its charter beyond this sphere.
- It is *designed to meet the needs of all sizes of institutions*, from land-grant research universities to small privates and community colleges.
- It is developed in a uniquely cooperative model called *community source*—a model in which participants build with others based on shared priorities and investments. Based on the principles of open source development, the community source model relies more explicitly on defined roles, responsibilities, and funded commitments by community members. Each participating member has an equal opportunity to influence direction and priorities.
- By the very nature of its members (many of whom are among the most innovative and important institutions in the United States), the Kualu community is *highly sustainable*. It will not fold, be sold, or be bought out as are many vendors of proprietary software.
- When member institutions are ready to implement new functionality, they are already familiar with it because they have participated in its design, development, and/or testing.
- Kualu software is released under the OSI-approved [Educational Community License](#), an open source license that provides all with the right to use, modify, and share the software source code. These freedoms are in contrast to proprietary licenses which restrict use, modification, and sharing.

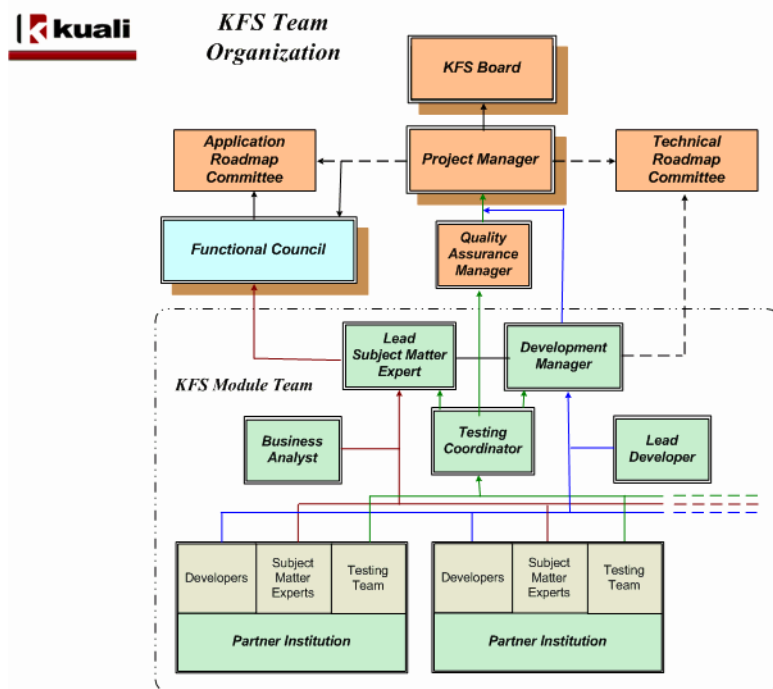
- Each Kuali application is modular so institutions can *implement only the modules they need*. Also, institutions are free to *replace components*— everything from an individual service to a complete module— without compromising the upgrade path.
- Because the Kuali Financial System is a community source product, institutions are *free to add functionality developed in-house or by others*. They are free to adapt this functionality to meet their needs.
- For institutions that customize Kuali software for their own use or are involved in the development of Kuali software itself, in-house developers can tap into the expertise of the entire Kuali community and that of other open source communities. They can readily obtain examples, source code, guidance, and problem-solving assistance from developers who have faced similar challenges. Kuali projects have a *very active community that provides a support structure for developers* that is not available with proprietary/closed-source products.
- Functional users have similarly *open access to subject matter experts/designers and other users*. They have an opportunity to fully understand the system— something that is not possible with proprietary software.

Development of the Kuali Financial System

The Kuali Financial System is based on Indiana University's existing, well-proven Financial Information System. The Indiana University system's design conforms to financial reporting system and financial accounting system practices used by more than 500 colleges and universities worldwide.

The Kuali Financial project currently has 12 investing partners. These partners contribute a combination of money and staff to the project.

Ongoing development of new features and maintenance of production releases is organized using common software engineering best practices. Governance and organization of this work is depicted in the following diagram.



The current development team for the financial system consists of nine software engineers, one lead engineer, one project manager, one quality assurance manager, one software-testing specialist, one configuration manager, and one business analyst.

The development team is supported by a network of 108 subject matter experts (SMEs) from partner institutions. These individuals are higher education controllers, assistant controllers, fiscal accounting managers/assistant managers, chief accountants/managing directors, purchasing directors, procurement coordinators, accounts payable supervisors, property and fund management directors, executive directors of research administration, directors/managers of operations, etc.

Extending the Core Kuali Financial System

Beyond the core development project, additional activities contribute to the evolution of the Kuali Financial System software. These additional development activities include:

- Contributions from individual institutions: During implementation and/or production use of the Kuali Financial System, individual institutions may make enhancements and fixes to the base product.

The Kualo community model provides a process through which such changes may be submitted, evaluated, tested, and approved for contribution so all can benefit.

- Cooperative enhancements and add-on functionality: From time to time, two or more community partners identify a need for additional functionality and organize a cooperative project to develop the enhancement. The Kualo community model fosters these cooperative projects. To date, a number of product enhancements have been developed in this way, and others are in planning stages. These joint efforts include:
 - Colorado State University, University of Arizona, San Joaquin Delta College, and rSmart have developed **Form 1099 Processing, Check Reconciliation, Automated Journal Voucher, Purchase Order Batch Upload, and Disbursement Voucher Batch Upload** functionality.
 - Michigan State University and University of California, Davis, have developed the **Stores Module** and **Shop Catalog Module**.
 - University of Arizona and Colorado State University have developed the **Procurement Cardholder Maintenance e-doc** and the **Procurement Card e-doc** enhancement.
 - Indiana University, Colorado State University, University of Arizona, Cornell, University of California Davis, Michigan State University, rSmart, University of Connecticut, and Vivantech are developing the **Travel Module** and **Contracts and Grants billing enhancements for Accounts Receivable**.

In future, miscellaneous enhancements that are developed and contributed by individual institutions will be organized into an [online repository of contributed enhancements](#). This repository is currently under development.

The Kualo Financial Functional Council currently shares ideas for future contributions at

<https://test.kualo.org/confluence/display/KFSIMP/Modifications>.

Appendix B: Kualifinancial System References

The following table identifies a sampling of institutions that are using the Kualifinancial System in production or are in the process of implementing it.

Institution	Contact Name, email, phone	Product Version	Modules in Production
Colorado State University	Troy Fluharty, Troy.Fluharty@ColoState.edu 970-491-6694	3.x	General Ledger, Chart of Accounts, Financial Transactions, Purchasing/Accounts Payable, Capital Assets Management, Kualu Rice**
Indiana University*	Kathleen McNeely kmcneely@indiana.edu 812-855-3377	3.x	General Ledger, Labor Ledger, Kualu Rice
University of Southern California	Ken Wozniak kwozniak@usc.edu 213-821-2000	3.x	Financial Transactions (Cash Receipt, Cash Management, Advance Deposit, Credit Card Receipt), Kualu Rice, and implementing approximately 5/31/2010 Procurement Card e-doc (PDOC) and a customized e-doc based off the Auxiliary Voucher
University of California, Davis	Michael Allred jmallred@ucdavis.edu 530-754-9868	Legacy FIS	Implementing Kualu Financial System 3.1 Chart of Accounts and Contract and Grants module in production mid-August 2010
San Joaquin Delta College	Raul Rodgrigez rrodriguez@deltacollege.edu 209-954-5018	3.x	General Ledger, Chart of Accounts, Financial Transactions, Purchasing/Accounts Payable, Kualu Rice**
Naval Postgraduate School	Thomas Halwachs Halwachs@nps.edu 831-656-2413	3.0 Beta	General Ledger, Chart of Accounts, Financial Transactions and Purchasing/Accounts Payable
Iowa State University	Maury Hope mmhope@iastate.edu 515.294.0323	4.0	General Ledger, Financial Transactions, Rice
Cornell University	Kim Yeoh ky16@cornell.edu 607-255-6513	4.x	In production: Kualu Rice (workflow) For 2011: General Ledger, Chart of Accounts, Financial Transactions, Purchasing/Accounts Payable, Capital Assets Management, Labor Distribution/Effort Certificate, Contract and Grants, Endowment For 2012: Budget Construction, Accounts Receivable
Michigan State University	Vincent Schimizzi Schimiz2@ais.msu.edu 517-353-3121 ext 243	3.x	General Ledger, Chart of Accounts, Financial Transactions, Purchasing / Accounts Payable, Capital Asset Management

**Colorado State University (CSU) is also using functionality developed collaboratively by Kualu Financial System community members for Check Reconciliation, 1099, Automated Journal Vouchers, Purchase Order Upload, and Disbursement Voucher Upload. This institution has also developed in-house and with rSmart a batch maintenance process

(account create process from Research Management System) and centralized workflow processes specific to its own needs.

This whitepaper was brought to you compliments of
the [Kuali](#) community and [rSmart](#).



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