EPET Web Service to PPS
(Electronic Payroll Expense Transfer)

**2010 University of California Larry L. Sautter Award
for Innovation in Information Technology**

Administrative Computing
& Telecommunications
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Project Information

The follow information is being submitted for consideration for the 2010 University of California Larry L. Sautter Award for Innovation in Information Technology. The application is being submitted jointly by UC San Diego and UC Office of the President.

Project Name

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Summary of Significance of Project

A Payroll Expense Transfer (PET) occurs when payroll charges are moved from one accounting distribution to another after they have been recorded in the operating ledger. UC San Diego generates approximately 25,000 PET transactions a year. The Office of Post-Award Financial Services (OPAFS) and General Accounting (GA) spend approximately 20 – 35 hours a month processing paper PETs. The paper-based request and approval process can take several months from the initiation of the PET at the department to final approval and posting.

The EPET system allows this process to take place electronically via a web application. It allows departments to submit the PET, get the appropriate approvals, and then post directly to PPS via a web service, saving time for both departments and central offices. The implementation of the EPET system has the following benefits:

- 50% decrease in the average time that it takes to process and post a PET; This effort is expected to decrease even further as users become more proficient in using the system.
- 50% decrease in the number of cycles to post a PET;
- Ability to electronically track the status of the transfer;
- Improved efficiency will improve compliance with A21 and UC cost transfer policies;
- The reduction/elimination of paper forms and backup documents;
- Elimination of data entry to PPS by central offices (OPAFS and GA);
- Increased user satisfaction with the process via intuitive UI;
- Self-service online training saves an average of 2 hours per user on training alone (classroom and travel time). For an estimated 600+ EPET users, that's a 1200 hour savings. In addition, it eliminates instructors' time and training system setup and maintenance.

This system supports the increased effectiveness of business and administrative processes by eliminating:

- manual completion of paper forms,
- physical routing of forms for approval signatures,
- physical routing/submission of forms to central offices for review and data entry, and
- correction of forms and supplying additional justification.

This system improves UC's IT environment by providing a generic web service that can be used by any of the UC campuses for posting PETs in the Payroll and Personnel System (PPS). The PPS system is hosted by UCOP for all UC campuses. This reduces effort and costs across all participating UCs.

In summary, there are three areas of significance to the campus and across all UCs:

1) Efficient/Scalable web application replacing a manual paper process
2) Decision Tree matrix, determining level of risk and approval hierarchy
3) System to system data upload based on a reusable PPS Web Service.

Project Description

The new EPET system is not only a substantial time-saving administrative application for UC San Diego, but has paved the way in providing a centralized Web Service to a core business system (PPS) for all UCs, served from UCOP. The EPET system has significantly reduced or eliminated steps for submitting and processing PETs throughout the University.

Current vs. New Workflow

The following outlines the numerous steps for the original Payroll Expense Transfer process in comparison to the reduced steps via the new EPET system:

Current Workflow	New Workflow

Department Steps:
1) Update PPS to reflect the funding changes.
2) Download either the PET single transfer or mass transfer form.
    • Single transfer form: Use this to transfer a single transaction line on the DOPE.
    • Mass transfer form: Use this to transfer consecutive line transactions on the DOPE.
3) Fill out the form
    • Use the distribution of Payroll Expense (DOPE) to fill out the form.
    • Transfers to extramural funds, must include appropriate reason for transfer.
4) Have the form certified and approved by the authorized representatives.
5) Send the form either to the Office of Post Award Financial Services (OPAFS) or to payroll.
    • Attach proper documentation such as DOPE's and PAR's, if required, or charges to extramural funds.
 	
OPAFS Central Office Steps:
1) Receive PET document
2) Filter out General Accounting (GA) PETs and send to GA
3) Log PETs (in Excel spreadsheet)
4) Go through 6-step decision to determine whether PET is ready to be posted (see attached PDF document entitled "**UCSD-OPAFSDecisionMatrix**")
5) Return to Department for additional information, if need be
6) Enter into PPS
	Department Steps:
	1) Select transactions for PET via a filtered set of DOPE data (based on query results)
	2) Identify dollar amount of PET and new accounting distribution for one or more selected transactions.
	3) Fill in answers to dynamically-generated questions based on complex decision tree of transfer criteria.
	
	OPAFS Central Office Steps:
	1) Receive notification of High-Risk EPETs only.
	2) Approve or Deny PET based on information provided.
	For details, see attached PDF document entitled "**UCSD-EPETAutomatedWorkflow**".

EPET Decision Tree

The crux of the EPET processing work is done by a module called the EPET "Decision Tree". This consists of a 30-point decision matrix which determines the supplemental information the user needs to provide, the level of risk of the requested EPET, the approvers needed for this request, and whether the EPET is even a valid one. The Decision Tree itself is an extremely valuable module that can be reused by other UCs. For complete Decision Tree matrix, please see attached PDF document entitled **"UCSD-EPETDecisionTree"**.

PPS Web Service

UCOP has developed and published an interface that allows access to the PPS system by the EPET system. Once all approvals have been completed, the EPET transactions are submitted to PPS via this secure Web Service. The web service mimics the basic functionality of the current PPS EDTS screen. It eliminates any manual data entry into the mainframe PPS system by the Central Offices.

Historically, the approach would have consisted of generating an extract file of all PET transactions on a monthly basis, FTP'ing this file to UCOP servers, invoking a batch job to parse through the extract file and posting the data into PPS. Some transactions would be rejected based on errors and would have to be re-processed at the next batch run cycle.

The PPS Web Service solution, although new and unknown, produced a unique and effective solution to address our needs. This approach eliminates maintenance of a monthly batch process and generation of extract file, thereby reducing multiple points of technical failure. It also provides a solution for other UC campuses with similar needs. Since all PPS systems are hosted at UCOP, it can easily be leveraged by other UCs.

Key Areas of Benefit

- **Innovation**
  The Web Service solution, although new and unknown, produced a unique and effective solution to address the needs of exchanging data between two distinct and separate systems. A Web Service is now available for other UCs to process Payroll Expense Transfers. The project provided a useful prototype for developing Web Services for PPS which UCOP was able to expand upon in a subsequent UC project.
- **Improvement of operational efficiency**
  The EPET system results in a reduction of manual processing time by more than 50% in the departments and even more in the Central Offices. The user interface is intuitive and easy to use. Much of the manual processing time is replaced by the complex and thorough "Decision Tree" logic as well as the electronic routing and approval mechanism. In addition, an interactive online training course was developed to reduce physical classroom time and training system support. Every EPET user is required to complete the online training prior to getting access to the EPET system.

- **Shareable, interoperable and integrated**
  The EPET Web Service can be adopted readily by other campuses, avoiding design, development and operation costs.
- **Collaboration**
  The functionality of the EPET system was formulated by business partners across campus in the following departments: OPAFS, Payroll, General Accounting, Pathology, Research Affairs, Engineering, Health Sciences, Orthopedic Surgery, and Geophysics. The IT solutions were the results of cross-functional areas within UCSD and UCOP which proved to be a valuable professional experience for the involved teams.
- **Success criteria**
  The following lists the criteria by which the success was measured:

Criteria	Goal	Actual
Time Savings for Departments	30% reduction	50% reduction
Time Savings for Central Offices	30% reduction	50%-60% reduction
Decreased Return PET Rate	30% reduction	50% reduction
Quicker post times of PETs	1 month/cycle reduction	1 month/cycle reduction
Ability to track progress of a transfer	Self-service online queries	Self-service online queries of document details, approval progress, and posting status. Additional management report can be developed based on EPET data.
Stable method for transferring data to PPS	Use screen scraping, batch, or web service to connect to PPS at UCOP	Shareable web service developed by UCOP for use by UCSD and other UCs

Technology Used

The following lists the technologies used for this project and the benefits of using those technologies.

Application Area	Technology	Benefits
Web Service Core	CICS Web Services (z/OS)	Robust Web Services Platform; Using CICS Web Services enabled developers to re-use legacy COBOL PPS code currently used by screen-based CICS programs, e.g., ROUTER, ARSM.
Web Service Access/Security	Apache CXF, PKI	**Apache CXF** - provides open source library for SOAP communication **PKI** - used to identify WS client and server provider

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Web App Presentation Layer	Spring MVC, Yahoo UI, jQuery	**Spring MVC** - fast development time with auto binding and easy error handling **Yahoo UI** - provides ready-to-use rich interface widgets **jQuery** - easy and fast Document Object Model manipulations
Web App Business/Data Layer	Spring Core, jLink DAO	**Spring Core** - IoC container for managing business logic. Interface design forces good design pattern. **jLink DAO** - standard interface for accessing data.
Approval Workflow	Current Financial System Approval Hierarchy, BeanFlow	Leveraged off existing technologies to reduce development time.

Timeframe of Implementation

This project was developed and verified in an iterative fashion in order to create solid building blocks and foundation for the whole project.

Task	Timeframe	Note
Requirements & UI Design	3.5 months	
Web Service	2 months	(includes UCSD and UCOP effort)
Decision Tree	1.5 months	
Transaction Search/Selection	2 months	
Approval Workflow	1.5 months	
Maintenance and Cleanup Jobs	1 months	
Total	11.5 months	

The rollout strategy consisted of a timed and systematic release:

1) Beta release to the seven core departments participating in the requirements process.
2) 3-month production pilot rollout to 12 departments representing a diverse set of units across the campus
3) Campus-wide release

Supporting Documents

The following attached documents include supporting details of the various areas addressed within this submission.

Name	Description

UCSD-EPETDecisionTree.PDF	The new decision tree used to determine the level of risk and approval hierarchy for the EPET transaction. This is the brain of the EPET system.
UCSD-OPAFSDecisionMatrix.PDF	The original manual decision matrix used by OPAFS to determine the level of risk and approval hierarchy of the submitted PET.
UCSD-EPETAutomatedWorkflow.PDF	The new system workflow of the EPET web application, including system-to-system interaction with PPS.
UCSD-EPETScreenshots.PDF	Mock screenshots of the EPET web application showing user friendly interface.

Objective Customer Satisfaction Data

The following includes some of the many position client feedback received immediately following the product rollout and usage. The names have been omitted and replaced by titles.

I found this process to be a huge improvement over the paper process. From our dept perspective, we were able to complete the EPET in about half the time of the previous paper process. So I would estimate it's at least a time savings of 1 or 1.5 hours per PET, especially since we don't have to print DOPES, make copies, send originals to OPAFS/Payroll, and go chasing the PIs around for signatures.

Good job!

Thanks,

(Management Services Officer, Political Science)

The system worked extremely well and I know that some of the issues we did have, have been resolved. Time-wise, it was reduced quite a bit without having to acquire signatures, printing DOPEs and marking them, making copies and sending it through campus mail.

This has been a long time coming and glad it is here!

Thanks to all of you for a job well done,

(Fiscal Manager, Institute of Geophysics and Planetary Physics)

The EPET system is saving me over 50% processing time vs. paper PETs. I anticipate with time I will be in the time savings of 60% to 70%. It is cutting down on the need of assistance via Students or temp employees to obtain financial and budgetary data needed to analyze each Paper PET. It also eliminates all the key entering of PETs by both Central Offices (OPAFS and General Accounting).

Thanks!

(Cost Transfer Accountant, Office of Post Award Financial Services)