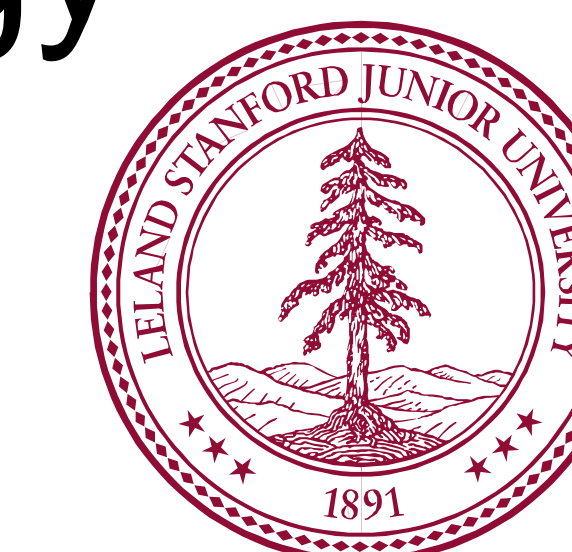




Improving efficiency and productivity by implementing a web-based LAMS combined with RFID technology

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Introduction

Laboratory Animal Management Systems (LAMS) are commonly used to facilitate research animal facility operations. Many systems are limited in scope and accessibility and often are simply data collection tools. Operations continue, therefore, to rely on manual, redundant, paper-based processes. This leads to inefficient use of personnel, is not scalable and makes tracking for auditing and compliance difficult. In order to better manage the business operations of a multi-site, academic research animal facility, we implemented a web-based LAMS focused on achieving:

- Integration of the LAMS, IACUC and financial systems
- Automated census process
- Paperless, streamlined operations
- Timely data delivery

Approach

We established an Executive Committee to provide project oversight and internal teams to detail functional and technical requirements. Commercial vendors were evaluated through a formal review process. After vendor selection, we refined the system and added RFID (radio frequency identification) technology to conduct census and tracking of animal inventory. We implemented the system in a phased manner, allowing time to identify and resolve technical and functional issues. We migrated current cage data into the new system by two methods: upload of current data and manual entering of current cage data to create new records/barcodes.

System Overview

A web-based interface is used for submission of requests and processing of orders, transfers and other requests.

This highly integrated system (Figure 1) eliminates the need for staff to use separate systems to perform various functions (entering purchase orders, verification of approved species and animal numbers).

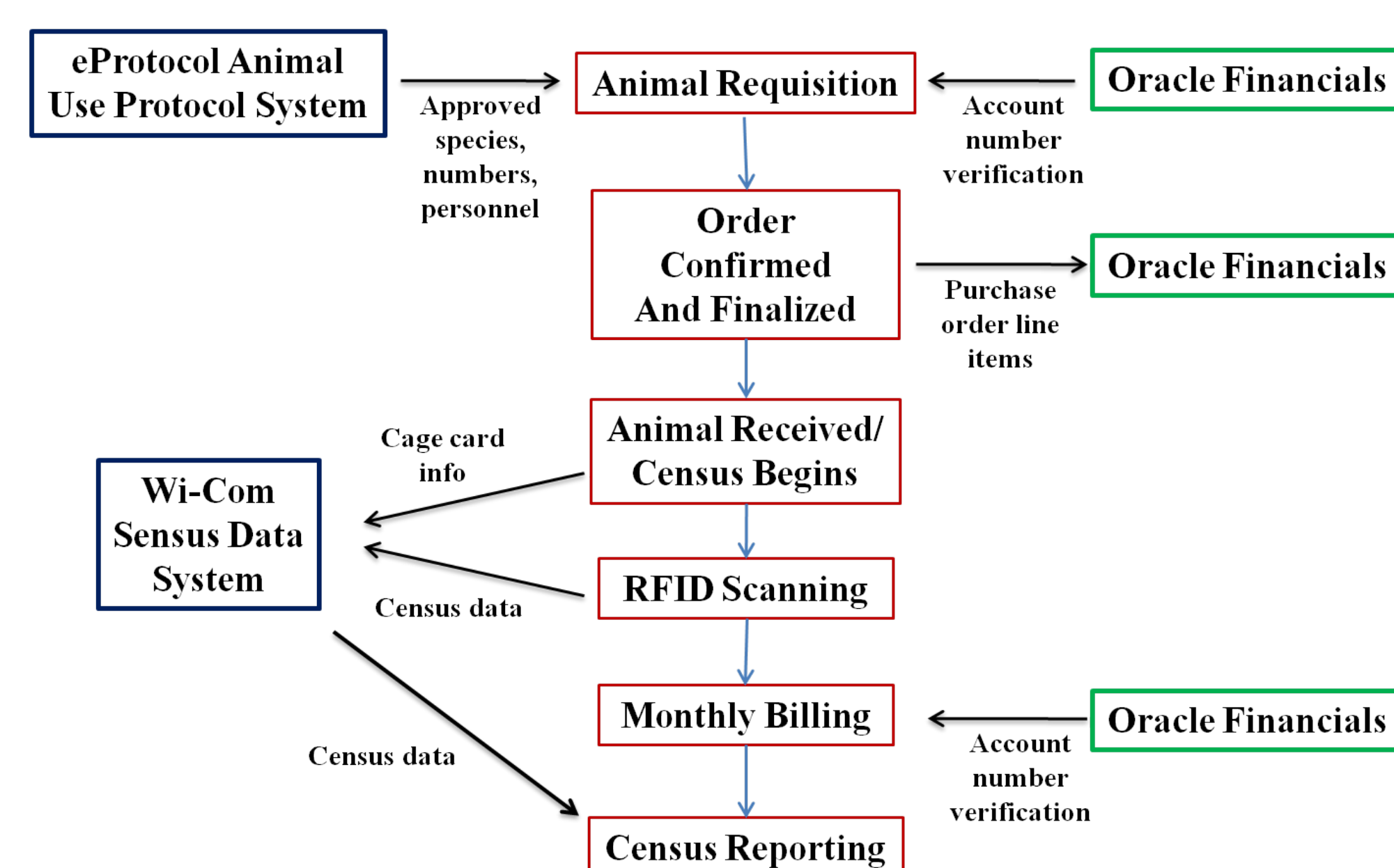


Figure 1. Overall Requisition/Census/Billing process flow showing key system integration points.

We gained new functionality as a result of the integration including documentation of approved protocol personnel and account number verification. Integration with the census system provides regular updates of cage location and check-out of cages.

Automated email notifications alert users when animals arrive and provides documentation of requests and transfers.

Observations/Results

Direct entry of order requests by researchers and automated delivery of order line items to the financial system reduces order data entry by over 50%.

Incorporation of RFID technology allows rapid scanning of cages to collect census data (see Figure 2). This replaces the burdensome paper-based, manual census that relied on daily cage counts. Currently, over 35,000 cages are scanned each month.



Figure 2. Scanning of RFID tags is done with a handheld device. All cages are associated with a barcoded cage card and RFID card holder.

The monthly billing no longer requires nearly 100 hours of staff time to process and enter data. Less than a day of staff time is required to prepare the data for final billing. Invoices are immediately available on-line and must no longer be printed and mailed by staff.

Census information is updated daily. A variety of on-line reports are accessible to staff and researchers for tracking and monitoring.

Lessons Learned

- Ensure adequate resources are available to staff and support the implementation and transition to the new system including requirements gathering, conducting the data migration, education and training of staff and researchers and post go-live user and system support.
- Evaluate processes before and after implementation to ensure LAMS workflow and processes are congruent, that staff is appropriately tasked and new processes are adequately supported.
- Be prepared for questions about labeling, tracking and managing cages, including set-up of new cages and movement of cages from one housing location to another. Use of RFID tags is new to most users.

Conclusions

Overall, this project demonstrates that with the implementation of a web-based LAMS and RFID technology animal facilities can create a nearly paperless environment, eliminate redundant processes, improve census and tracking, and provide access to information in a timely and transparent manner.

Acknowledgments

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For further information

Please contact Felicia Gentile at gentile@stanford.edu. More information on this project is available at: <http://med.stanford.edu/compmed/animalTrax/#>