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**UC Tech Awards 2023 Candidate**

**Category:** OPERATIONAL EXCELLENCE  
**Name:** VMACS Team (7)

**Number of people:** (7) **Location:** UC Davis

1. **Person submitting the application/nomination**

Dan Ransom, IT Director (Applications), Dean's Office: SVM-IT

UC Davis School of Veterinary Medicine (staff)

* 1. **Email address:** [djransom@ucdavis.edu](mailto:djransom@ucdavis.edu)
  2. **The name of your organization:** UC Davis

1. **Award category** Operational Excellence
2. **Name of person, name of the team, or name of the project to receive the award**

VMACS Team

1. **All project team members - if applicable**

Everyone on the team is staff and all are at:

Dean's Office: SVM-IT

UC Davis School of Veterinary Medicine

1. Chris Brandt, CIO, cmbrandt@ucdavis.edu
2. Dan Ransom, IT Director (Applications), djransom@ucdavis.edu
3. Nick Ilacqua, VMACS Supervisor, nnilacqua@ucdavis.edu
4. Brandon Edwards, Development Supervisor, bsedwards@ucdavis.edu
5. Alex Beech, Senior Developer, acbeech@ucdavis.edu
6. Moon Bae, Applications Developer, hmbae@ucdavis.edu
7. Justin Ross, Applications Developer, juross@ucdavis.edu
8. **Which location was affected by the work?** (the name(s) of the organization affected)

* William R. Pritchard Veterinary Medical Teaching Hospital (UC Davis, School of Veterinary Medicine)
* Gourley Clinical Teaching Center (UC Davis, School of Veterinary Medicine)
* UC Veterinary Medical Center, San Diego

1. **Summary** (1-3 sentences synthesizing the longer “Narrative - see below)

To run a top tier veterinary hospital of such size and complexity, the UC Davis School of Veterinary Medicine relies on its custom-built hospital information system: VMACS. The application development team was charged with modernizing, mobilizing, and dramatically expanding it. At the same time, the entire team of developers was retiring. The VMACS team rose to meet this challenge.

1. **Narrative**

Project Summary

The William R. Pritchard Veterinary Medical Teaching Hospital at UC Davis is a top clinical care institution that provides cutting-edge 24x7 veterinary medical services to over 60,000 animals a year, ranging from cats and dogs to horses, cows, and exotic species. More than one thousand technicians, students, residents, and veterinarians rely on the hospital's information system, VMACS, to manage clients and appointments, request and report laboratory results, enter patient medical data, prescribe medications, and much more. VMACS is a custom-built, one-of a kind application that combines and integrates dozens of necessary hospital functions into a single interface. The original application, built more than 30 years ago, relied upon MUMPS (M) technology and was unable to provide for new needs such as a mobile interface, methods to allow online payment, and modern, secure coding practices. In addition, the entire VMACS development team was scheduled for retirement within just a few years.

Seven years ago, responding to these critical needs, the VMACS team began the effort to transform itself and the entire VMACS application by documenting processes and transitioning knowledge between staff, replacing key infrastructure, implementing modern project management techniques, and deploying new, modern interfaces. The multi-year effort continues to this day and has already reaped enormous rewards for the hospital and the entire school while maintaining 24x7 service with top-notch availability.

## Implementation

* Addressing the looming staffing needs, the team completed a massive analysis and documentation effort to identify and record the internal workings and business logic for the muti-component web application. As the existing development team with a combined 85+ years of VMACS knowledge approached retirement, training and knowledge sharing sessions occurred with onboarded replacements. New responsibilities and roles were established and new, modern technologies were investigated, prototyped, and deployed.
* More than 350,000 lines of modern Java alone have been created so far to replace legacy M code. This includes queueing and notification systems, a security and authentication overhaul, and complicated interfaces to third-party hospital hardware including laboratory analyzers and pharmacy dispensers. New virtual servers were deployed to replace physical servers and integration points were added to numerous external systems.
* VMACS itself was dramatically expanded to provide external portals for clients and non-hospital (referring) veterinarians. Both portals allow for messaging back and forth with hospital services and veterinarians, viewing patient and visit details, and (in the case of the client portal) paying bills. SMS messaging and automated voice calls were added to provide appointment reminders and receive cancellations.
* An entirely new mobile interface (Pocket VMACS) was released to provide read-only access to patient data for veterinarians when access to a desktop or laptop is challenging.
* Modern, agile project management tools, including the use of Kanban, were implemented.

## Impact

* Modern code now comprises more than two thirds of VMACS, replacing legacy M code. Not only were existing web pages modernized but new tools were built to support an enterprise imaging system, an emergency room patient tracking dashboard, interfaces to banking and finance portals, and a new patient treatment tool.
* More than 32,000 clients can now take advantage of the new client portal. The ability to message veterinarians and upload images has become one of the most appreciated features by clients and staff. Millions of dollars of revenue now come into the hospital through the client portal and the new mechanisms for invoicing and follow up have increased payment rates. SMS and voice appointment reminders and online cancellations have led to significant decreases in no-shows and improved staff scheduling capability.
* The entire original staff of VMACS developers, including the development supervisor have retired. Their replacements have been onboarded and trained to a very high level of expertise. The documentation developed during the knowledge transfer process became the backbone of a new, shared knowledge base leading to increased code quality. In 2022 the number of hotfixes required to correct issues in VMACS dropped by two thirds.
* User feedback has been near-universally positive. In the last year, feedback surveys for VMACS-related service desk tickets have been 100% positive. Unsolicited feedback for major updates to laboratory and client messaging tools have praised the smooth transition, added features, and responsiveness of the VMACS team.
* The new project management focus allowed the team to successfully categorize, close, or re-address hundreds of open service desk tickets, some going back years. Hundreds more feature requests were consolidated, reviewed, and prioritized in an organized, multi-month effort to address the backlog.

## The Future of VMACS

VMACS has now been made available outside the veterinary hospital to the Gourley Clinical Teaching Center and outside the UC Davis campus to the UC Veterinary Medical Center, San Diego. In both locations VMACS use continues to expand. Other universities, including the University of Tennessee have received a demonstration of VMACS and subsequently inquired about the potential to license the system to replace their hodge-podge of third-party tools and components.

Development in VMACS will continue for some time to replace the last, buried pockets of M code but the hospitals staff and clinicians are already extremely happy with their "new" VMACS. The new development team releases updated versions of VMACS almost monthly while the team balances the remaining code replacements with new feature requests, bug fixes, and updated interfaces. The VMACS team has received both formal recognition and public praise for their results and continue to demonstrate phenomenal operational excellence in all that they produce.