

**NACUBO Innovation Award 2010**  
**Marist College**

When the College began considering the replacement of the aging Enterprise Resource Planning (ERP) system, the challenges were many and the projected costs seemed exorbitant and endless. In addition, senior managers wanted to follow best practices and assure an on-time, on-budget, and thorough implementation. There were also some core requirements that were very important to the College's strategy and it was not clear whether or not a commercial ERP provider could respond to all of the College's needs. Senior management decided to perform a skills and asset inventory to assess whether the College could take an intelligent risk to implement the ERP system in an innovative manner by utilizing the College's deep experience with applied research. With Marist's leadership position in the Enterprise Computing Community, funded by the NSF, the College had a strong student / faculty / staff research heritage. Marist's joint studies in high performance platforms had proven time and again that new edges in systems use and deployment was achievable. The recent successful enterprise implementation of the Sakai Community Source Collaborative Learning Environment (CLE) that was fully integrated with campus systems, and modified to run on a high performance, high efficiency platform gave management confidence that the College could replicate the methodology with an ERP system. Furthermore, Marist's leadership role in the development and roll-out of Linux on System z in partnership with IBM and proven experience in high end technical support to numerous other colleges and organizations also played a key factor in the College's decision to use applied research to meet our enterprise resource computing needs. Marist had experience in creating "Best of Breed" technology environments that combined commercial vendors, community and open source systems and operating systems, and internally developed tools for innovating hardware platforms, databases, and programming.

At the outset of the project, all major ERP vendors were contacted, as were representatives of community and open source systems. The criteria for acceptance of a proposal was straight forward; the system had to meet Marist's processing needs, be Linux based, be open or at least somewhat open, run on the College's existing high performance platform (the IBM z) to save energy, avoid or eliminate extraneous capital costs, and save space in the College's data center. However, no single system existed that would meet these criteria. After a second round of discussions, the College selected the only vendor willing to do research with Marist to allow us to innovate, integrate and apply their system to Linux, run on the high performance System z, and move application development

to a community source model. Marist opted to partner with SunGard Higher Education for the ERP with research license to develop the College's own hardware solution. Additionally, there was the understanding that SunGard was willing to consider moving to a different product development and deployment method similar to the community source model. By leveraging lessons learned from previous research and drawing from a deep knowledge of community and open source operating systems and high performance computing platforms, senior staff was convinced that Marist could run "Banner on the z" in a virtualized environment, while avoiding considerable capital and operating costs.

A traditional Banner implementation requires considerable computing horsepower and usually a number of different servers. When implemented correctly, a test server set, a pre-production set, and a production set are all required. At the on-set of the project, Marist was able to reduce the number of required servers by half when the staff migrated the existing system databases onto one larger server to run as a virtualized application on an open operating system on the z9 mainframe. This project included moving the database and servers from approved operating systems and hardware platforms first to pLinux on IBM's Power series and then to zLinux on IBM's z9 mainframe that runs in a virtualized and cloud based SaaS model at the College. This mainframe based system has been in production since early 2009. In the upcoming summer of 2010, all extraneous servers being used for Banner will be retired and the entire system collapsed on to one virtualized server environment.

With "Banner on the z", Marist became the first college to develop the tools, programming, and instruction sets to successfully run SunGard Higher Education's Banner database on an IBM z9 mainframe in the Linux environment. Marist's initiative to run SunGard's Banner product on the IBM z9 mainframe in the Linux environment is innovative and the first instance of this configuration in production anywhere. Banner has never run in production on pLinux or zLinux virtualized platforms before and will now not only run on new high performance platforms but will be cloud and SaaS enabled. At the inception of the project, there was no one to call for direct assistance, and it was necessary to pull from all of the College's technology resources to be successful. This included staff, faculty, students, and partners.

While Marist researched and began implementing the Banner system on the experimental platform, the College also collaborated with SunGard to participate in the creation of a Community Source Initiative so that projects such as these could be absorbed and used by the client base as a whole. At about the same time that the College went into production with the Banner database on the z, SunGard began the creation the Community Source Initiative and invited Marist to provide a leadership role with a seat on the Steering Committee. During the course of the Banner project, Marist expanded its network with external organizations such as IBM, SunGard Higher Ed., and Vicom Infinity, Inc. By doing this, technology research at Marist College became more effective and allowed the College community to develop a wider range of strategic partnerships to create new opportunities for students, faculty, and staff. The Marist project "Banner on the z" helped support the College's long-range plan to identify, develop, and use community and open source technology. Marist has developed the new technology with the intent to donate it back to the Banner community, about 1,700 strong, in the community source mode.

Marist avoided significant capital expense for hardware, network, and climate control systems and recurring operating expense by leveraging the existing high performance z9 mainframe. Virtualization, in Marist's case, meant that Banner would be running along with 75 other major server applications already in production on the same z9 server. Our implementation has been one of large return on assets. With each application that the College adds to the mainframe, we add no capital or operating costs but receive considerable additional benefit from the leveraging of the asset. The implementation of Banner in a virtualized high performance environment eliminated the need to replace old hardware or order new servers to keep up with the increased user demands and provided a more reliable platform. It is also of note that no new network fabric had to be added, no additional data center or rack space was used, and no increase in climate control was necessary to add this system to College operations. The lowest return we calculated was a cost avoidance of at least \$350,000 for servers we did not need to acquire and \$64,000 of annual hardware maintenance the College is not paying. Using the existing mainframe also avoided the additional power consumption of a minimum of 6.2Kw power usage and 21496 BTU/hour of cooling equipment. Not only is this a considerable operating cost avoidance, this initiative is extremely green. This configuration avoided environmental costs for the energy required when additional servers and supporting hardware are purchased. The project created a more sustainable IT platform and made it possible for Marist to be a more cost effective and efficient educational institution.