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Commonwealth of Virginia

University IT Internship Partnership
Department of Mines, Minerals and Energy

Category

Cross-Boundary Collaboration and Partnerships

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Executive Summary

The Virginia Department of Mines, Minerals and Energy (DMME) is a small agency which serves a large customer base of citizens, organizations and agencies. Through its six divisions, the agency regulates the gas and oil, coal and mineral mining industries, provides mineral resource research and offers advice on the wise use of the Commonwealth's energy and mineral resources.

DMME's headquarters is located in the region of the state's highest concentration of mineral resources, Southwest Virginia. This rural, mountainous and geographically remote area is economically distinct and struggles for educational and employment opportunities, particularly for its young people.

The agency operates on level funding at best; it has added no full-time IT staff over the past ten years, despite significantly increased demand from both internal and external customers. Due to its small size, large scope of work and limited budget, DMME has made major efforts to provide effective IT solutions which enable the agency to meet its strategic goals and objectives.

Since 2001, DMME has utilized partnerships with area universities for student IT interns to work onsite as software development team members. In the fall of 2006, the University of Virginia-Wise launched the first undergraduate software engineering degree program in Virginia - one of only ten in the nation. DMME quickly established a formal partnership with the new department, which provided students dedicated to the pursuit of software engineering – a direct match with the agency's business need.

The agency benefits from an energetic and cost effective IT workforce, a continuous flow of new ideas and, most importantly, IT solutions to meet agency business needs. Thanks in large part to the work of its IT interns and with no budget increase, DMME has dramatically increased its online and mobile applications. Measurable cost savings and award-winning applications demonstrate the value of collaboration.

The universities benefit when their students undertake real world projects. Students receive necessary financial assistance, a real-world work environment and a portfolio of product upon graduation. The region and the Commonwealth benefit when students train and work in a targeted growth industry without leaving their home area.

DMME's student IT intern program is an exemplary example of industry, government and education collaboration to meet organizational and budgetary goals while building a skilled workforce and investing in the region's youth. It strengthens the technology-based economy in the region and the high-tech landscape of the Commonwealth.

Description of the business problem and solution

The Virginia Department of Mines, Minerals and Energy (DMME) is a small agency which serves a large customer base of citizens, organizations and agencies. Its mission is to enhance the development and conservation of energy and mineral resources in a safe, environmentally sound manner to support a more productive economy in Virginia.

Through its six divisions, the agency regulates the gas and oil, coal and mineral mining industries, provides mineral resource research and offers advice on the wise use of the Commonwealth's energy and mineral resources. Its programs directly serve citizens who live near mining operations, mine workers and labor groups, other regulatory agencies, the educational community, the mineral industry, and environmental, citizen and industry groups.

DMME's headquarters is located in the region of the state's highest concentration of mineral resources, Southwest Virginia. This rural, mountainous and geographically remote area is economically distinct and struggles for educational and employment opportunities, particularly for its young people.

Virginia has historically directed significant economic development efforts toward the region and continues to do so. Former Governor Mark Warner and current Governor Timothy M. Kaine successfully pursued location of information technology (IT) focused companies to the region; in 2007, both Northrop Grumman and CGI opened major new IT oriented facilities in the area.

The Commonwealth supports public universities in Southwest Virginia, including the University of Virginia's College at Wise (UVa-Wise), Mountain Empire Community College, and a satellite location of Old Dominion University.

DMME operates on level funding; minimal state general fund increases and frequent reductions create an extremely tight budget and personnel situation. DMME has added no full-time IT staff over the past ten years, despite significantly increased demand from both internal and external customers.

Due to its small size, large scope of work and limited budget, DMME has made major efforts to provide effective IT solutions which enable the agency to meet its strategic goals and objectives. Achievement of DMME's vision to be a nationally recognized energy, geology, and mineral extraction customer service agency is closely tied to its ability to deliver information and services through customized applications.

DMME has a small in-house development team of three software developers and an IT manager. This team supports more than 230 employees, of which 140 utilize custom laptop-based applications to perform inspection, assistance and enforcement activities in the field on a daily basis.

DMME considered several options to provide IT solutions. Complete outsourcing of applications development and rollout was considered, but ruled out due to cost. Use of contract employees through the Commonwealth's IT staff augmentation program was tried, but due to DMME's remote location, it quickly became evident that identification, availability, travel and costs associated with qualified contract employees prohibited success. Addition of full-time employees also was considered, but ruled out due to limited long-term funding issues.

Since 2001, DMME has established partnerships with each of the area universities for student IT interns to work onsite as DMME software development team members. DMME works with professors and the financial aid offices to ensure communication and outreach to potential interns; staff also assist students with course selection. DMME staffers actively participate in university and college planning committees, work as adjunct faculty and provide feedback to and participation in campus programs as part of the communication and implementation plan.

In the fall of 2006, UVa-Wise launched the first undergraduate software engineering degree program in Virginia. The program is not only the first of its kind in Virginia, but also one of only ten in the nation. DMME recognized a potential synergy and quickly established a formal partnership with the new department, which provided students dedicated to the pursuit of software engineering – a direct match with the agency's business need. This partnership launched the DMME internship program into high gear.

DMME provides an hourly intern salary of $9.00, paid to the University through internal agency transfers. Interns are managed and mentored by the DMME in-house software development team for progress and growth. Interns receive computer-based training from staff, including significant instruction on information security and accessibility for the disabled in compliance with the Commonwealth's strict standards as part of software development. One intern, a significantly disabled student, has been an exemplary participant who brought real-world perspective to the need for accessibility for the disabled; this graduate now will continue work on a federal grant-funded project for DMME on a contract basis.

Significantly, DMME recruits its IT interns early, preferably as freshmen; it retains these interns throughout their college careers and provides progressively challenging projects that become real-world applications, meeting the business needs of the agency.

Significance

DMME's student IT intern program is an exemplary example of industry, government and education collaboration to meet organizational and budgetary goals while building a skilled workforce and investing in the region's youth. It strengthens the technology-based economy in the region and the high-tech landscape of the Commonwealth.

Thanks in large part to the work of its IT interns and with no budget increase, DMME has dramatically increased its online and mobile applications. Web-based customer service tools, electronic permitting, GIS systems and mobile enforcement applications developed through the work of student interns now permit the agency to operate much more efficiently and in a customer-centric fashion within its limited resources.

The internship program has provided necessary financial assistance for students who might otherwise not have had the opportunity to continue in their education. It also provides a real-world work environment and a portfolio of product upon graduation.

The agency has received the benefit of an energetic and highly cost effective IT workforce, as well as a continuous flow of new ideas and, most importantly, IT solutions to meet agency business needs.

The UVa-Wise software engineering program produced its first graduates in May 2009, but the benefits to students, universities, DMME and its customers have been accruing through work programs and live applications over the past seven years.

The DMME program allows students to find gainful employment within the IT sector and to remain in the Southwest Virginia region. The region continues to be plagued by the loss of its best and brightest students to more metropolitan areas. Through these partnerships, students are offered employment opportunities in the IT Industry that did not exist five years ago.

The DMME IT internship program aligns directly with the 2009 NASCIO State CIO Priority of Budget and Cost Control. It meets goals of Virginia's Strategic Plan for Information Technology: increase accessibility to government, facilitate IT collaboration and partnerships, ensure a trusted and reliable technology environment, create a reputation of performance for technology, and increase worker productivity through the use of technology. The program also aligns with two of Governor Kaine's stated priorities – to be the best managed state, and to be a national leader in preservation and enhancement of our economy.

Benefit of the project

As an excellent model for public higher education collaborations with the private sector and regional entities, the student internship program supports workforce development in an emerging industry in Southwest Virginia. These programs help ensure that the universities will produce graduates capable of being contributors in today's IT industry. By providing internship opportunities, DMME has:

- Created an opportunity for students to gain real-world experience and use their knowledge and skill;
- Provided exceptional mentoring, which encouraged educational and skill development of the students;

- Enabled students to work in a professional, team-based and results-driven environment; and
- Enabled UVa-Wise to strengthen the marketing of the newly created software engineering program and other computer science-related programs.

The financial benefit to students in the region are estimated to be over $170,000 in salary paid to date by DMME through its student IT internship programs.

DMME, its customers and the Commonwealth have also realized measurable benefits through the IT internship program. The financial benefit of the student intern program to DMME over the past seven years has been estimated to be over $500,000.

One Division of Gas and Oil (DGO) project is particularly illustrative. Since July 2006, student interns contributed 2,524.34 hours to the project at $9 hour, for a total student investment of $22,719.06. Their work comprised 50% of total time for software engineering. The Commonwealth's Supplier Managed Staff Augmentation for IT personnel, mandatory for executive branch agencies, would have charged $31.73 for a similar level 2 programmer in DMME's geographical zone (if one had been available) – for a total of $80,097.30, a savings of $57,328.25 on just one application.

This student intern-supported application won a 2008 Digital Government Achievement Award from the Center for Digital Government, a Governor's Technology Award, and the Southwest Virginia Technology Council's award for High Tech in Government. DMME's laptop and Web-based mobile systems have been consistently recognized in benchmark sessions by the Interstate Mine Compact Commission (IMCC) as the best in the nation.

In the initial pilot phases of the program, DMME internal agency funds (primarily permit fees) were used to pay for student interns. As students progressed in expertise, external grants were sought for projects with student interns as the programmers.

DMME has since successfully applied for numerous state and federal grants to develop IT solutions for agency business problems using its interns as the primary resources. The Office of Surface Mining (OSM) Administration and Enforcement Grant and the OSM Abandoned Mine Land Grant have both been used to support student interns. A number of one-time grants also have been received to support student internship work, including: Virginia Dept. of Environmental Quality's federal Section 106 water quality grant; OSM Electronic Permitting Initiative for the Appalachian Region; Mine Safety and Health Administration's (MSHA) Brookwood Sago Grant; MSHA mine mapping grant; USGS data preservation grant; and the Governor's Productivity Investment Fund grant. DMME has been awarded $93,400 through these grants for just the designated student IT internship portions of these applications.

DMME's customers have reaped significant benefits thanks to the many new e-Gov applications supported by student IT intern work. For example, industry customers using

the student-driven online e-Forms application report substantial time savings in preparing and submitting required applications and reports.

An electronic permit renewal with no changes now takes five minutes to complete in the e-Forms center, compared to one hour for the equivalent paper form. A mineral mining permit renewal with changes previously took a customer 3-4 hours to complete; e-Forms reduces this to one hour. For the 440 mineral mine sites in Virginia, this represents an aggregate time savings of from 400 to 1200 worker hours per year. Customers also save an estimated six days per round trip and cost avoidance compared to the U.S. Postal Service.

For the agency, the applications enable a streamlined permit review process, reduced opportunity for data entry and transcription errors, reduced paper handling and a reduction in storage space required for paper documents. Another efficiency benefit for the agency has been greater customer compliance with regulatory requirements and deadlines.

Citizen self-service access to agency data also has been enabled through student intern projects by including inquiry-only versions of e-Gov systems, allowing viewing of non-confidential gas and oil data and generation of information reports, including interactive search and a downloadable digital archive of thousands of scanned gas well logs. This functionality increases transparency and frees staff time.

These improvements would not have been achievable without the work of the student IT interns, and in turn, they are able to point with deserved pride to real-world use of their work as they enter the IT industry. One former intern summarizes this well in a letter to his former supervisor:

"The DMME college internship has been invaluable to my professional career. Having real world experience and several software development projects to put on my resume helped me rise to the top of my class and land that ever elusive first job. With polished communication skills, a padded resume, and real world experience to lean on I was able to go after the job I wanted out of college, not a job I had to settle for."

This program's multi-faceted success has been well noted by other Virginia entities. Currently, DMME is working with the Chief Applications Officer and the Virginia Enterprise Applications Program to establish similar programs in the Richmond area. Through this extension, student IT interns may soon be supporting not just individual agencies but also development of applications that will be utilized on an enterprise basis.