

Managing Employee Leave via a centralized Web Application

Tanja Davidson, Lead Analyst Programmer

Administrative Computing Services

North Carolina State University

Wanda Karangelen, Assistant Director, Salary Administration & HRIS

Human Resources

North Carolina State University

Sidney F. Holmes, Assistant Director for Applications Development

Administrative Computing Services

North Carolina State University

Mardecia S. Bell, Director

Administrative Computing Services

North Carolina State University

Abstract

NC State University realized the need for an enterprise wide web based leave system for tracking employee leave approximately three years ago and began the process of creating a solution. This proposal will discuss the development life cycle of the Web Leave System and the process that was followed to ensure an application that met the needs of the Campus, incorporated a comprehensive set of business rules, and provided maximum accessibility and usability. This application is a centralized application that is available 24 hrs, 7 days a week (with the exception of scheduled maintenance), is platform independent, and is automated to the extent possible. It processes based on State of North Carolina leave policy guidelines, and allows for ad hoc reporting by NC State Human Resources division. The methods campus departments had used to track leave were diverse, error ridden, mostly manual, and time consuming. There were limited reporting capabilities because the only capability was for manual reporting of total leave balances and information was limited to annual, sick and compensatory leave. The Web Leave System has provided a solution to all these issues and more. Use of the application was not mandated. It was initially written for use by one division within the University. It became so popular within the units that were using it, that other campus departments began to request permission to use it after hearing about the application via word of mouth. It is now being used by 100% of the departments at NC State. Campus leave administrators no longer need to pull information together from several sources to create required reports at the end of the fiscal year. This has brought about a significant cost savings to the departments by freeing up employee's time, both within the departments and in Human Resources and has greatly enhanced the accuracy of individual leave and reports.

Introduction of the Organization

North Carolina State University is a campus of achievers. As a progressive, research-extensive land-grant institution, NC State educates students for the 21st century and inspires future leaders. It forges unique partnerships that generate economic development, and applies its research discoveries for the benefit of people in North Carolina and across the United States.

A nationally recognized leader in science and technology with historic strengths in agriculture, textiles and engineering, NC State has evolved into a comprehensive community of scholars with outstanding degree programs in the humanities and social sciences, design, education, natural resources, business and veterinary medicine. It keeps its roots deep in the North Carolina community through statewide research, extension and outreach activities.

The university has an annual budget of approximately \$820 million and an endowment valued at more than \$312 million. It is ranked 8th among national research universities in non-federal funded research, 13th among national research universities in industry-funded research, and 31st nationally in total expenditures for research and development. NC State is ranked 1st in total research expenditures in the 16-campus University of North Carolina system, and 2nd in total state and local research funding among national research universities. NC State's expenditures for research and sponsored programs exceed \$440 million.

Technology transfer is a vital part of what we do. The university is ranked 17th in the nation for launching start-up companies, and has received more than 350 patents for beneficial technologies developed by our world-class faculty. Students interact with and learn from industry, government and business partners every day at NC State's acclaimed Centennial Campus, which is a widely recognized model for how universities can construct academic partnerships with the private sector.

NC State is a tremendous asset to its home state, through partnerships that foster economic development and an extension network that reaches into each of North Carolina's 100 counties and the Cherokee Reservation. Being engaged with the real-life concerns of our state is part of NC State's land-grant mission, but in recent years it has been taken to a new plane. Every college at NC State now has an outreach function. You can find university faculty, staff and students working all across the state to achieve everything from better air quality to improved wood products.

The university has more than 6,000 employees, including approximately 1,600 faculty and extension field faculty. Currently, NC State faculty includes nine members of the National Academy of Sciences, nine members of the National Academy of Engineering, and numerous Fellows in a large number of professional associations. Excellence in teaching, research, extension, engagement and public service, and student services is valued highly throughout the university.

A bright and diverse student body calls NC State home. The average incoming freshman scores 1193 on the SAT and attains a 4.01 GPA. NC State students come from all 50 states and 110 countries. In 2002, our undergraduates won many of the nation's most prestigious academic honors – including a Marshall Scholarship, Truman Scholarship, an Udall Scholarship and four Goldwater Scholarships. Ten graduate students received National Science Foundation Graduate Research Fellowships – an indication of the quality of students NC State attracts and produces.

NC State offers bachelor's degrees in 92 fields of study, master's degrees in 101 fields and doctoral degrees in 58 fields, as well as a Doctor of Veterinary Medicine degree.

Fifty-five research centers, institutes and laboratories support more than 400 faculty, 900

graduate students and 200 undergraduates. The NC State Libraries rank 32nd among national research libraries. Campus libraries offer a wealth of research resources for faculty and students, and, through the Triangle Research Libraries Network, also provide access to resources housed at Duke University, the University of North Carolina at Chapel Hill and North Carolina Central University.

NC State's athletic program is outstanding. Each of the past three years, NC State's charismatic football coach, Chuck Amato, has lead the Pack to bowl games while the men's basketball team advanced to the second round of last year's NCAA Tournament. Women's basketball coach Kay Yow, a member of the Basketball Hall of Fame, has more than 600 wins to her credit. A stunning new sports arena, the RBC Center, beckons students, alumni and area residents to come and root for the Wolfpack. If you prefer arts to athletics, options include the highly regarded University Theatre, an acclaimed Gallery of Art and Design and the State Dance Program, which is recognized for excellence by the American College Dance Festival Association.

Located in North Carolina's capital city, NC State anchors one corner of the Research Triangle Park, which houses more than 140 organizations dedicated to innovative research and development. Duke University in Durham and the University of North Carolina at Chapel Hill mark the other two points of the triangle. This fast-growing area consistently ranks as one of the nation's best places to live and do business.

Statement of the Problem/Initiative

NC State University was faced with a major problem reporting employee leave. The university needed a centralized application that would be available 24 hrs, 7 days a week, was platform independent, was automated as much as possible, that would follow the state of North Carolina leave policy guidelines, and would allow for automated ad hoc reporting by Human Resources. The methods in use by departments to track and report employee leave were error ridden, time consuming, and allowed for limited reporting capabilities because the only information available was in summary form and did not include all allowable employee leave types.

Design

The primary goals in developing the application were to create an application that efficiently and correctly tracked all types of employee leave and provided comprehensive reporting capability for the Human Resources division. Since the population of employees who would be expected to use the application was so diverse, it was imperative that the application be exceptionally intuitive and easy to use. The initial process followed to design the new system was to gather the business requirements from Human Resources staff, the Office of State Personnel and by reverse engineering code in an existing DOS based leave system. Once the business rules were established, Administrative Computing Services (ACS) identified one college and two administrative units to act as advisors to design and develop the new application. Representatives from the College of Agriculture and Life Sciences, the Office of Academic Personnel Services, and Human Resources served as campus leave advisors. These units were chosen because all of the different types of employees on campus fall under their jurisdiction. An initial meeting was held with members of the ACS Quality Assurance (QA) team to ensure an infrastructure existed to support the new application and to make certain appropriate web development policies and procedures were followed. The QA team consists of representatives from each of the following units within ACS:

- Database Administration
- Production Control
- Web Services

- Solutions Center (Help Desk)
- Systems Support
- Security administration
- Distributed Systems Support
- Applications Development

Database Services created Employee Leave databases on the Development, QA and Production servers for use by Developers. Security Administration agreed that access for leave administrators should be handled by NC State's Automated Security Access Procedures Application and began the process of incorporating the new application into the security application.

A prototype was written using the Perl programming language and presented to the upper management of Administrative Computing Services. ACS staff reviewed the prototype to provide advice about ease of use and intuitiveness and to provide valuable constructive criticism about program features, functions and interfaces. Changes were made and an iterative process was initiated with Leave application campus advisors for additional input to ensure rigorous testing before placing the application in beta testing. The Design and Development Phase took approximately six months to complete.

Implementation

Once the prototype had been approved by the campus leave advisors, the QA team and ACS management, the application was released for beta testing. The colleges and administrative units who served as advisors were the initial Beta participants. Database Services and Web Services ensured the application was moved to the production servers. Beta testing began with approximately seven business units participating. That number was quickly expanded to fourteen as word of mouth of the new leave system spread. The Developer provided training for all beta leave administrators in one-on-one sessions. As each training session was held, the new leave administrator was granted access to the application. With each new unit added came requests for changes in the application's design. Each enhancement request was quickly accommodated as the requests were received. The application was given high priority to allow the developer to deal with questions, problems and design issues quickly and resulted in even greater support of the new application by the campus users. Campus employees were encouraged to submit suggestions and the quick turn around of the solutions by the developer aided in gaining employee buy-in of the product. The application was implemented with a relatively small development team made up of one analyst programmer, three data base analysts, one web administrator, two production control staff, and three Human Resources staff.

The Web Leave System remained in beta testing for approximately six months before it was released to production. As requests for changes diminished and many more departments requested to join the beta group, the decision was made to move forward with production implementation and the application was published to the Human Resources website.

Human Resources provided training for all leave administrators after the application entered the production phase of the development life cycle. Human Resources also actively participated in advertising the benefits of joining the Web Leave System to each department who had not already begun to use the new system. Enticements included promises of not having to manually produce time-consuming reports required by the Office of State Personnel. Anyone already in the system would have their information pulled by Human Resources and their report would be handled for them. By the second year of implementation, Human Resources was able to provide motivation to the very small group of departments not using the application by demonstrating the benefits of reporting through the application. It should be noted that the application has never been mandated but is in use by all departments on campus. The application was so popular that over 70% of campus came onboard within the first year and the rest came onboard the following year.

Employee information such as name, full time equivalency, status, anniversary date, and other necessary data is updated by nightly jobs that interface with the Human Resources ERP system and are automatically run via a 3rd party job scheduler.

Benefits

Numerous benefits were noted immediately upon the application going live. These include:

- All employees can now submit, edit or delete leave records at any time from any location as long as they can access a web browser and have an internet connection. They can also generate real-time reports of their leave at any time.
- Groups of employees who had historically been excluded from some administrative applications (county extension employees are an example) are able to use the Web Leave System thanks to platform independence and reliance on the enterprise wide Human Resources System.
- Reports display totals for both approved and unapproved leave.
- Supervisors can approve leave from any location with an internet connection.
- Human Resources can now automatically generate reports required by the State as well as ad hoc reports.
- Auditors can easily audit the leave records for compliance with state policy.
- State policies are included in the application as business rules and are easily accessible for change and additions.
- Automation of leave accruals and aging of both compensatory time and adverse weather leave was accomplished.

- Up-to-date leave balances are available for printing on payroll check stubs and are automatically fed to the enterprise Human Resources system for reporting.
- Automated Year End processing and archiving are implemented.
- Archival of 5 years leave records for easy access to previous year's records for reports is in place.
- The application allows for multiple year processing with one click of a mouse.

Retrospect

In retrospect, more time could have been taken to refine business rules for all employee types allowed for in the State system (Exempt from the Personnel Act - EPA, Subject to the Personnel Act – SPA, and Temporary). This would have decreased development time. The application was written with emphasis on employees who earn leave (EPA & SPA) and not to other types of employees. During beta testing, it was determined that some employees who are not eligible for leave had a legitimate need to access the system because some are in roles as supervisors or leave administrators. A workaround has been established to accommodate this requirement and a permanent solution will be developed. The current process requires additional training of leave administrators to handle these special cases.

In the near future, enhanced methods to process leave for employees who leave the university, but return within a short period of time will be developed and implemented. Currently, employees are paid out for accumulated leave when they leave the University

but not all the leave administrators enter the paid out leave into the System. Thus, when the employee returns, there is a data cleanup issue.

Adverse weather was handled differently from the other types of leave based on business rules from Office of State Personnel. In North Carolina, employees are allowed one year to make up time taken during periods designated under the adverse weather policy. This usually takes place during events such as ice storms, heavy snow and hurricanes. This difference in processing has created confusion for some employees when they post adverse weather taken or made up. This should have been designed to be consistent with the method used to process other leave types.

In conclusion, the Web Leave System has been a time and money saving, positive addition to administrative applications at NC State. It was well received by the employees who use it (9,000+ employees) and continues to receive positive feedback from employees, supervisors and leave administrators. The application has generated interest from other Universities within the UNC System and some outside the system. It has created a positive image for ACS, Human Resources and the University Administration.