

Contributors

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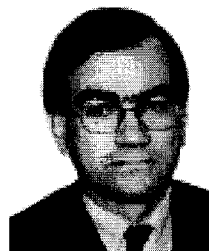
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Raymond W. Eyerly, PhD, (“The Long and Winding Road: The Politics of Building an ERA System”) is a Senior Research Associate at the Environmental Resources Research Institute of The

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UCLA School of Medicine. This is one of the largest research operations at UCLA, with revenue in FY99 of \$52M. One of his responsibilities is the organization’s pre-award office, which is a proposal processing center for 74 faculty members. Some of the computerized programs he helped develop for grant preparation and data management have been used extensively by other universities across the country. Robert also helped design the NIH templates that were released electronically as part of the ERA initiative a few years ago. Robert has a B.A. from Brigham Young University and an MFA from the University of Utah.



Jenny Tomkins (“It’s not always ‘TGIF’ in Sponsored Projects”) has worked in academic research administration since 1996, assisting faculty and staff at Northern Illinois University to prepare

proposals for submission. Before that she worked “on the opposite side of the fence” as a grantwriter and fundraiser for a number of not-for profit organizations. Born in the UK, she has worked in both England and South Africa for Oxford University Press as an editor and publicist.

Feature

The Long and Winding Road: The Politics of Building an ERA System

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Abstract

This paper presents a case study of the development of a comprehensive ERA system at The Pennsylvania State University (Penn State). Authors examine the external barriers and internal political pressures that can affect the implementation of ERA on a university campus. This case study demonstrates the importance of involving all stakeholders in the planning, development and implementation of ERA; the necessity of paying attention to the needs, the fears, the egos and the turf concerns of all constituents and partners; and the reality that change can be a unpredictable and circuitous process.

Introduction

Many research administrators have found the road to Electronic Research Administration (ERA) to be long and winding — and often quite grueling. Before attempting to establish an ERA program at your institution, you must be certain that you are personally convinced of its value, otherwise you will not have fortitude to stay the course. For one thing, you will be heading into virtually uncharted territory, and you may have to construct your own map to reach your (as yet) unknown destination.

The Pennsylvania State University (Penn State) began to seriously pursue the implementation of a comprehensive ERA system in 1994. However, as early as 1986, Penn State's Office of Sponsored Programs (OSP) had implemented electronic databases.

The first system was a proprietary system that ran on a CPT-UNIX computer. Limited in scope, it only recorded basic information about the proposals and awards we processed; it did not have a proposal or budget development component. However, the system did enable college research administrators to

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access the database via a modem connection. While these forerunners were certainly ERA applications, they were not comprehensive ERA systems.

Justifying the Need for ERA

Significant resources are required to implement an ERA system. To justify such expenditures, upper administration must be convinced of the need for ERA. At Penn State, our commitment to the development of ERA was driven by the following factors:

1. **Staff Reductions.** The Office of Sponsored Programs (OSP) encountered severe staff reductions during the early 1990s. Penn State embarked on a rebudgeting program that was led by the "Futures Committee." This committee set up a schedule that required units all across Penn State to "recycle" operating funds back into a central pool. Futile attempts were made to exempt expenses that were included in the indirect cost pools since these costs were reimbursable under OMB Circular A-21. By reducing the amount of funds spent supporting sponsored projects administration, we actually reduced income, thus further exacerbating our financial difficulties. The recycling required led to a 40 percent reduction in the OSP's budget for operating costs and a 25 percent reduction in staff positions.
2. **Increasing Workload.** These staff reductions coincided with dramatic increases in workload. From FY85 to FY95, Penn State's research base grew 250 percent larger, while professional staffing in OSP shrank by nearly 25 percent. During the period of FY91 through FY95 alone, the *per capita* workload of OSP staff increased by over 80 percent.
3. **Geography.** Over the past decade, OSP moved (in several steps) from the central campus to a site located three miles from the campus core. The logistics of reviewing and approving proposals and awards from this site was extremely cumbersome and resulted in

the need for additional financial and human resources.

4. **Reengineering.** As reported in a previous study by the authors (SRA Journal, Volume XXIX, Nos. 1 and 2, 1997, pp. 25-31) Penn State developed a "distributed environment" for research administration. The nature of this "virtual organization" required instant access to shared data and documents across Penn State.
5. **Infrastructure Changes.** In the conversion from the CPT data system to a client-server network and database, the colleges lost access to their own data because the new system lacked essential security features. Thus, there was a strong demand from the colleges for renewed access to their data.
6. **Sponsor Demand.** As part of the Federal Government's plan for streamlining governmental processes, a number of federal government agencies began to incorporate e-commerce into their systems, including those involving the receipt, review, award, management, and close-out of federal grants and contracts.
7. **Campus Demand.** Principal investigators, unit directors and research deans had been demanding an easy-to-use tool for project financial management for years. This particular need had been voiced at the highest levels of Penn State's administration, and the demand for action had grown more intense.

The First Attempt

With all of these external and internal pressures, OSP was compelled to investigate the potential of ERA. Our first step was to join the ERA Demonstration Project. The ERA Demonstration Project was initially funded by a cooperative agreement from the U.S. Department of Energy to Federal Information Exchange, Inc. of Gaithersburg, Md. Its goal was to demonstrate a standardized method for the electronic creation, submission and processing of university research proposals. The demonstration focused on the implementation of EDI (electronic data inter-

change) standards that were being developed by the federal (interagency) Electronic Commerce Committee.

Agencies participating in the project eventually included: the National Institutes of Health (NIH), the Office of Naval Research (ONR), the Army Research Office (ARO), the Army Medical Research Acquisition Command (AMRAC) and the Air Force Office of Scientific Research (AFOSR). Participating institutions included Penn State, the Massachusetts Institute of Technology, Florida A&M University, University of Notre Dame, University of California - Los Angeles, Fred Hutchinson Cancer Research Center, Duke University, Baylor College of Medicine and the North Carolina State University/GAMS Consortium.

We learned that if we were going to successfully compete for limited institutional resources, we needed to have strong university-wide backing.

The project was successful; it demonstrated the “proof of concept” that a complete, computer-to-computer proposal transaction was feasible. It also demonstrated that federal agencies were interested in, and could move toward, electronic research administration. (See <http://web.fie.com/web/era/project.htm> for more information about the ERA Demonstration Project.)

In March of 1995, Penn State established an ERA Task Force to define Penn State’s needs in relationship to ERA. The ERA Task Force was comprised of research administrators, but it failed to involve important stakeholders such as faculty, executives and other interest groups. This proved to be a tactical error.

In early 1996, because of intense pressure from the faculty to have an improved post-award reporting system, the whole ERA initiative received executive attention and was put on a fast track by Penn State’s administrative information systems people.

There were not many ERA solutions available; those that were available were surveyed and costed out. After finding out the cost of the options, Penn State’s administration balked. Support for an ERA system, which had once existed at the higher levels of administration, evaporated. Because all of the stakeholders had not been involved in the ERA Task Force, there was no grass-roots support for the system, and the initiative did not have sufficient momentum to get through the period of “sticker shock.” Thus, the project was tabled and effectively killed.

We concluded that our failure to obtain the funding necessary to begin development of an ERA system was the result of our top-down approach. While it is (obviously) essential to have the support of upper-level administration, such backing can disappear if other competing needs have more grassroots support. Resources are scarce and the competition for them is severe. We learned that if we were going to successfully compete for limited institutional resources, we needed to have strong university-wide backing.

The Second Attempt (Or, if at first you don’t succeed...)

Our opportunity to gain that broader support arose in 1996 when a new Vice President for Research was appointed. In one of his first actions, the vice-president created a task force to review research administration and technology transfer. This task force began its work early in 1997. Its charge was “to make recommendations on ways to improve the University’s support of the research enterprise.”

The membership of the task force was diverse and included faculty, students and college deans. Associate deans for research, the controller’s office and research administrators (both central and college-level) also

were involved. In addition, there was a deliberate effort to receive input from other important Penn State stakeholders (facilities management, university development, indirect cost experts, etc.).

The task force devoted considerable effort to benchmarking our processes and resources with other schools. These efforts included site visits to institutions that embodied best practices. Finally, the task force conducted a thorough analysis of the data collected.

One of the first topics reviewed by the task force was ERA. A study was completed by two research administrators on the committee (one central and one from a college) and the representative from the controller's office. This study resulted in a 138-page report analyzing the state of ERA. It addressed the following general topics:

- What is ERA?
- What are funding agencies doing?
- What are private companies doing?
- What are other institutions doing?
- What is Penn State doing?
- What does the future hold?

The discussions ensuing from the report went on for many months. In the end, the task force recommended that the Vice President for Research and the Senior Vice President for Finance and Business vigorously pursue the development and implementation of a total ERA system, and that Penn State budget the funds necessary to accomplish this goal.

The "total ERA system" was described as, "an end-to-end, seamless, user-friendly system combining research support, information and project management." The report called for a system that would provide on-line desktop access to an integrated distributed network linking the Office of Sponsored Programs with colleges and units. Moreover, the task force recommended a system that would allow faculty and staff members to access information about prospective funding opportunities, develop and submit proposals and progress reports, access accurate and informative financial reports and ensure timely invoicing.

The promulgation of this recommendation, and the broad consensus that it represented, permitted Penn State's ERA efforts to shift into high gear. This was the first step in developing the grassroots support that was lacking in our first attempt.

Our next step was to present the Budget Task Force (this is the committee of senior university officers and administrators that makes final decisions on budget allocations) with the ERA recommendations. In spring of 1998, the Budget Task Force called for a study of how to best develop and implement an ERA system. This led to the formation of the ERA System Design and Implementation Advisory Committee.

The charge to this committee was to assist in the "review of system options and recommendations, selection of an ERA system and system implementation." It was co-chaired by the Director of the Office of Sponsored Programs, the Assistant Controller and the Director of the Office of Administrative Systems (OAS). Once again, broad representation was recognized as essential to achieving university-wide support.

The committee decided that the best approach for implementing a comprehensive ERA system was a systems integration methodology.

Grassroots support was again nurtured by including faculty, research deans, campus research administrators, financial officers, as well as representatives from the controller's office, the human resource office and the telecommunications office. Campus computing personnel and OSP staff members were also on the committee.

The committee reviewed both systems that existed in some state of completion and those that existed only as "vaporware." Systems that were assessed as having the potential to scale up to an institution the size of Penn State were selected for further study. Vendors for these selected systems were invited to come to Penn State to make presentations and demon-

strations to the committee. What became clear from these presentations was that no single, comprehensive ERA system (as defined by the Task Force) actually existed.

However, the committee recognized that components of a total system existed; some were already deployed at Penn State, some were under development at Penn State and some were available (or projected to be available) from vendors. The committee decided that the best approach (balancing cost, technical risk and time) for implementing a comprehensive ERA system was a systems integration methodology. Penn State would build a system out of components.

The committee identified the required system components (in terms of functions) and then identified the software applications that fulfilled the requirements. In conclusion, the committee recommended that the Grants Application and Management System (GAMS) form the hub of our comprehensive ERA system.

The committee's recommendations were presented to important Penn State groups to further build grassroots support. Penn State's Administrative Committee on Research (research administrators and financial officers), the Research Council (college and unit research deans and directors) and the Faculty Senate Committee on Research (all faculty members and researchers) endorsed the committee's recommendation. In addition, the recommendations were presented to the Strategic Planning Task Force for University Administrative Information Systems, which not only endorsed the plan, but also made it a part of the Penn State's AIS strategic plan.

The recommendation and endorsements were then presented to Penn State's Budget Task Force. The Budget Task Force approved the plan and budgeted the requested funds.

ERA Systems Integration

While this whole consensus building process was being conducted, development of some other key components was proceeding. The office of Research Information Systems developed the Web-based SIMS (Strategic Information Management System) application for reporting on sponsored projects activity.

Many different classes of users, from college research administrators, to department heads and college deans, to vice presidents were given secure access to a 10-year database of sponsored project proposals and awards.

The system has drilldown capability from campus aggregated figures to details on individual projects. Access to data is determined on the basis of job function and unit. The data can be instantly sorted by department, investigator and/or sponsor with a click of a button, and the display can be configured by the user.

Another ERA component that was under development was the Financial Information Tool (FIT), a Web-based financial project management tool designed for faculty. Previously, a client-server-based version of FIT had been deployed and while it worked well for financial professionals and research administrators (who are versed in accounting) it was considered unusable by the faculty because of its complexity and the specialized knowledge it required.

In taking the "long and winding road" to ERA it is important to recognize that it is a journey that involves fellow travelers.

The Web version is a complete redesign of the client-server version. It provides faculty with a quick snapshot of a grant account while at the same time providing the ability to drill-down to accounting details. The main window shows a summary of the account, based on the budget categories used by the National Science Foundation (NSF) and the National Institutes of Health (NIH). Financial data reported include the budget, expenditures, encumbrances and balance. The tool also shows account information in easy-to-

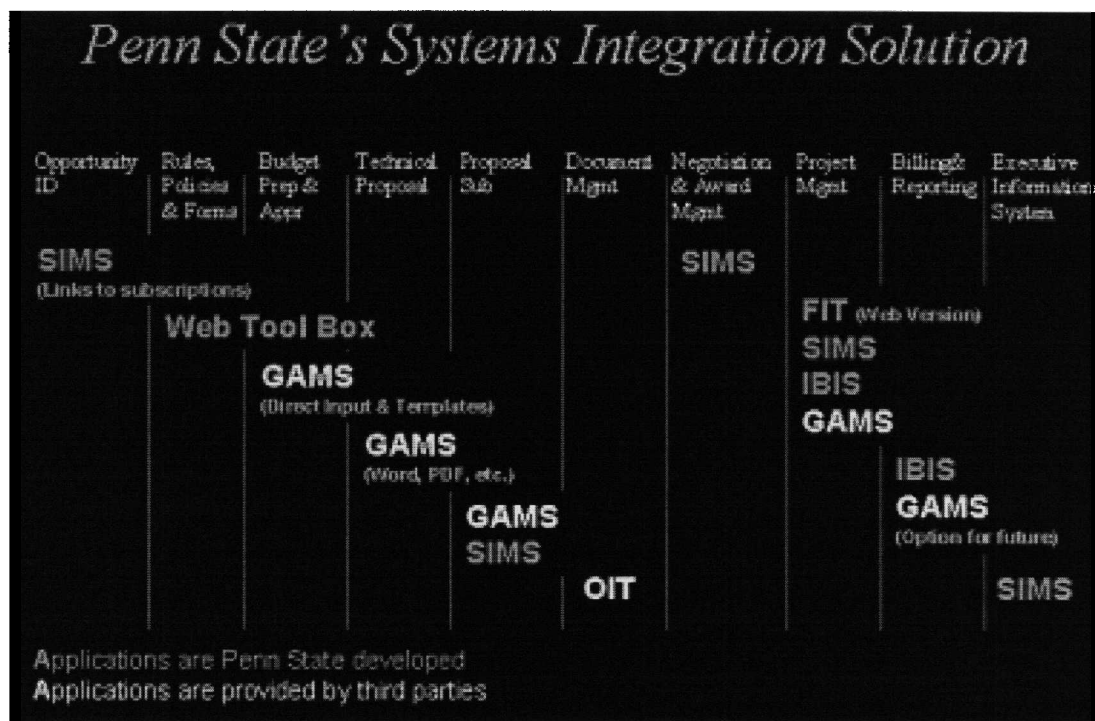


Figure 1

interpret graphical presentations and allows investigators to download account data easily to a spreadsheet, letting them develop what-if scenarios on their own.

Finally, the Office of Research Information Systems also designed and implemented a document imaging and management system. We purchased a system from a vendor (Optical Image Technology), and contracted with a consulting firm to help us integrate the applications with other Penn State ERA applications. The integration work is complete, and the system is operational through SIMS (on a development server at the time of publication), with new and archive data being entered daily. Beta-test users are currently able to drill down through SIMS from the highest level of aggregation right to the level of viewing an actual proposal, negotiation or award/contract document. Security for the system is provided by the SIMS security profiles, utilizing DCE security, ensuring confidentiality of proposal and award documents.

Our efforts in systems development helped us to better understand the functions comprising a comprehensive ERA system and how the various elements should be integrated. These main software applications will be integrated to form our ERA system; they include GAMS, SIMS, FIT, Penn State's

deployed financial system (named IBIS, the Integrated Business Information System) and the imaging and document management system. A high-level view of our system architecture is shown in Figure 1.

Lessons Learned

The process of developing an ERA system taught us a number of important lessons. The most important was to be sensitive to the needs, fears, egos and the turf concerns of our constituents and partners. In taking the "long and winding road" to ERA it is important to recognize that it is a journey that involves fellow travelers.

A second very important lesson we learned was that decision-making comprises both objective (rational) and subjective (emotional) elements and that these elements must be reconciled (made consistent) before a decision can be made. This means that the members of your advisory committee must not only agree to the facts and recommendations (obtaining intellectual/objective buy-in) but also commit their emotional/subjective support of the decision made.

Often it is easier to achieve intellectual/objective agreement than emotional/subjective agreement because it is difficult to

identify and address emotional issues. For example, if research administrators at the department level feel threatened by ERA because they fear ERA will eliminate the need for their job or increase their workload (two contradictory views that might actually be held simultaneously by a single individual), you are not going to get buy-in, no matter how logical your plan is, even if there is explicit agreement on the intellectual/objective level. You will experience resistance (and sometimes sabotage) at every step of the way.

Also, if there is any dissonance between the subjective and objective awareness of the institution's primary decision-makers, a decision will simply *not* be made and the ERA initiative will die.

We also learned that the lifecycle of an initiative like ERA can be described as a "punctuated equilibrium." By this we mean that change is usually manifested by a slow, evolutionary process; changes, when implemented, are incremental, and the *status quo* is generally defended. However, once in a great while, there will be occasions when, due to the entry of new forces (political, technical, or both), the landscape suddenly shifts and a brief interval of instability is created that permits (and sometimes encourages) rapid, revolutionary change. In our case, a task force was the political mechanism and the Web was the technological enabler that allowed us to wholeheartedly pursue ERA.

A final lesson is that success begets success. Or perhaps more properly, success begets the tools that beget success. In either case, to a great extent it was the Office of Research Information Systems' successful deployment of SIMS that convinced many within Penn State that we might be able to design, develop and implement a comprehensive ERA system. The success of SIMS built confidence and trust among our constituents and partners.

Conclusion

In sum, our experiences at Penn State have taught us that to develop support for ERA, research administrators must:

- establish the need for ERA;
- build a consensus around do-able ERA solutions;
- involve stakeholders in the planning and implementation of the ERA system; and
- continuously market and sell ERA to all campus constituencies.

The process of implementing ERA at Penn State has not been easy or direct. There will undoubtedly be more to learn and greater challenges to overcome given the rapidly changing field of research administration. We hope the information contained in this article will be of use to other universities that are on the long and winding road to ERA.