UNIVERSITY OF PENNSYLVANIA

Office of Research Services

FUNCTIONAL REQUIREMENTS

PennERA

Electronic Research Administration
at the University of Pennsylvania

February 14, 2001
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1. Overview

1.1. University Overview

The University of Pennsylvania is a premier research institution with over 22,000 employees and 20,000 students from around the world. Founded in 1740 as a charity school for Philadelphia children, the University of Pennsylvania is America’s first university and one of its foremost institutions of higher education. Located in West Philadelphia, Penn offers its students the resources of one of the world’s best research faculties and of a major metropolis rich in history, tradition and culture.

Today, Penn is a national leader in interdisciplinary programs that combine academic theory with professional practice. Among the Penn programs that cross the traditional boundaries between academic and professional disciplines are the Joseph H. Lauder Institute for Management and International Studies, the Management and Technology Program and the Institute for Medicine and Engineering.

Penn’s four undergraduate schools - the School of Arts and Sciences, the School of Engineering and Applied Science, the School of Nursing and the Wharton School -- have a combined student body of nearly 10,000. Over 10,000 students are enrolled in Penn’s 12 graduate and professional schools, many of which are leaders in their fields. The Wharton School consistently ranks among the nation’s top three business schools, the School of Nursing is one of the best in the United States, and the School of Arts and Sciences, Law School, and School of Medicine rank among the top ten in their respective categories. Penn is also one of only two private institutions in the country with a School of Veterinary Medicine. Penn’s other graduate and professional schools are the Annenberg School for Communication, the School of Dental Medicine, the School of Engineering and Applied Science, the Graduate School of Education, the Graduate School of Fine Arts and the School of Social Work.

Additional information on the University may be obtained through Penn’s web site: www.upenn.edu

The University of Pennsylvania has undertaken a major effort to achieve excellence in the delivery of administrative services within a framework that focuses on satisfying customer requirements, empowering the faculty and work force, and continuously improving service delivery processes. The University wants to achieve breakthroughs in performance. Information systems and technology will be used to facilitate and encourage the re-design of administrative processes rather than merely to automate current methods. Our goal is to ensure that neither work effort nor information is unnecessarily duplicated, that controls that remain in place are required for valid business reasons, and that technology not only
transports information seamlessly through each required step in a process, but also makes the
information readily accessible to everyone who has a "need to know."

This principle of re-engineering business processes prior to the introduction of new
technology requires the phased implementation of new systems, within the context of a
common architectural framework, as re-engineering initiatives are completed.

1.2. Purpose of RFP

A Request for Proposal (RFP) is intended to provide vendors with sufficient information to
respond with a proposal and bid for a software solution that will fulfill the electronic research
administration requirements at the University of Pennsylvania. As part of this solution, the
University will consider an approach that includes both a software product and the services to
implement that product. This document includes the general and functional requirements of
the system, the Critical Success Factors, the technical specifications, the proposal terms and
conditions, and other requirements to be met by each vendor.

The Request for Proposal is intended to allow vendors to respond with accurate proposals and
bids which address the following components of this project.

- A proposal, addressing both software and related service alternatives with estimated
time lines and price ranges, to deliver the PennERA Electronic Research
Administration System consistent with the requirements described in Sections 2
through 8, and the Technical Specifications and Infrastructure described in Section
9.

- If a vendor bids on part of our RFP, a detailed description of software offerings and
related service alternatives, with price ranges, to deliver the proposed components of
the PennERA Electronic Research Administration System consistent with the
requirements described in Sections 2 through 8, and the Technical Specifications and
Infrastructure described in Section 9.

For each of the project components, the vendor should propose a range of service
alternatives, with corresponding price points, addressing different levels of support for
project management, additional clarification of requirements, where necessary, installation,
implementation, training, and/or other related project activities.

The document includes:

- Description of project scope;

- Description of system functional and technical requirements;
• Instructions governing proposal submission, materials to be provided, general evaluation criteria, and requirements which must be met in order to be eligible for consideration.

A series of appendices at the end of the RFP provide additional background or information.

1.3. Research at Penn - Overview

In the last 10 years, sponsored research at the University of Pennsylvania has grown immensely. In fiscal year 2000, nearly $540 million was granted to the University for research by public and private sponsors. This accounts for nearly 33% of the entire University budget. The School of Medicine has led the way in research, not only at the University, but across the nation as well. Over the past decade, the School of Medicine at the University of Pennsylvania has been the leader in rate of growth for National Institutes of Health sponsored research and is second in total funding from NIH. The majority of research at Penn is Federally sponsored with National Institutes of Health and National Science Foundation providing the majority of awards. According to the latest available NSF data, the Penn ranks fifth among all colleges and universities for all federal support to science and engineering research and development. Penn’s research is internationally acclaimed in medicine, chemistry, engineering, biology, the humanities and education. Penn was honored to have a faculty member awarded the Nobel Prize in Chemistry in 2000.

1.4. Research Administration at Penn

The administrative portion of research is typically divided into two main functions: pre-award and post-award activities. Pre-award activities begin with the inception of an idea for a research proposal, through proposal development, routing and internal approval of the proposal, submission to the sponsor and, ultimately, through the University accepting an award. Once a grant or contract has been given to the University, it is considered an award to the University, and post-award financial activities begin. At this point, the award is assigned one or more fund numbers to track the revenue and expenditures for the life of the award. In general, administrative activities for a grant involve creating and tracking expenditures, encumbrances and commitments for activities associated with research, budget and effort tracking, providing sponsor deliverables (reports) in a timely fashion and, depending on the type of award, invoicing the sponsor and accounting for the monies received for the award. Of course, the main purpose of the award is research and the activity of research is conducted by the investigator and their colleagues. It is the activities during the execution of the research; the expenditures generated, salary paid, effort expended, compliance required and accountability demanded that the PennERA system will address.

A research project at Penn is begun with a proposal for research from a faculty member at the University. This proposal may be the result of a solicitation, a response to an RFP or a program announcement from a sponsoring agency. Typically a proposal is approved within an investigators department and school with additional approvals being required for the
department and school of any collaborators and if any regulated activities are involved such as the use of human or animal subjects. The proposal is then forwarded to the Office of Research Services (ORS) for institutional review.

ORS is the official signatory authority for sponsored research at the University of Pennsylvania. ORS handles a multitude of tasks that support research activities throughout the University. ORS performs the final review of all research proposed to external sponsors and is responsible for the final financial reporting to the sponsors. During the life of a project ORS may provide interim financial reports if needed.

The staff of the University Laboratory Animal Resources function, the Offices of Regulatory Affairs, and Environmental, Health and Radiation Safety utilize grants and proposal information to manage regulatory and compliance issues related to conduct of sponsored research as well as ensuring the safety of both human and animal subjects. The Center for Technology Transfer (CTT), negotiates contracts with private sponsors and also manages issues related to intellectual property and patents. The Office of Audit and Compliance serves as a proactive business partner with University management to strengthen and enhance Research Administration, monitor and oversee the research enterprise, research compliance training initiatives and communicate and track emerging research issues.

1.5. PennERA Challenges

PennERA faces challenges and seeks to enable the University to mitigate risks and to ensure positive outcomes in the following areas:

- Proposal development/review – The University’s current process for preparing, reviewing and approving proposals, which is both time-consuming and inefficient, requires much manual intervention and support. Clear visibility of what is in the “pipeline” is sought.

- Management of research funds – The current financial system provides an acceptable tool for accounting for all project budget and expense activity; PennERA seeks the flexibility to report budget and expense activity in a manner consistent with most proposal budgets (i.e., in the sponsors’ terms) and to provide the tools needed to proactively manage cost-shared situations.

- Support of sponsor mandates with regard to protocols involving human and animal subjects – The current processes cannot efficiently tie research protocols to individual grants to support the protocol review process, the proposal process and the post-award re-certification of the protocols.

- Stewardship of the sponsor’s resources – The University recognizes the need to continually improve the research infrastructure and processes to provide better oversight and stewardship of public and private funds.
• Management of faculty effort - The current process provides for effort certification but cannot provide for effective resource planning, either in advance of or during the execution of project.

• Management of project deliverables – The current environment requires significant paper documentation and manual processes to ensure that all sponsor requirements, whether interim, final or in support of the overall agreement/terms with the University are met in a timely manner. It is both error-prone as well as inefficient in its use of file space.

1.6. External Factors

Research at the University of Pennsylvania operates under the principles of the Office of Management and Budget circulars A21, A110 and A133. Any solution provided by a vendor must comply with the Cost Accounting Standards set forth in these circulars.

Circular A21 establishes principles for determining costs applicable to research and development, training and other sponsored work performed by colleges and Universities under grants, contracts and other agreements with the Federal Government. The principles deal with the subject of cost determination.

Circular A110 establishes uniform administrative requirements for Federal grants and agreements awarded to institutions of higher education, hospitals and other non-profit organizations.

Circular A133 establishes non-federal entities’ responsibilities and compliance requirements for managing federal assistance, and the scope of audit requirements with respect to that assistance.

Federal agencies are beginning to mandate the use of electronic systems for the submission and management of research grants. Several agencies, with the Office of Naval Research and the National Science Foundation at the lead, are or will be requiring the electronic submission of proposals. The National Science Foundation’s Important Notice #123 outlines these goals and stresses the importance of working toward a paperless proposal and award systems. It will be necessary to be able to conduct electronic research administration to remain eligible and competitive for federal grants.

1.7. Scope

The University anticipates that its initial efforts will focus on the implementation of an integrated set of core functions. The University expects to implement these functions in a phased approach. These functions include:

• Proposal Development
• Protocol Development
• Approval and Routing
• Proposal Submission
• Award Management
• Billings and Receivables
• Reporting

A vendor may submit a bid for any or all of these functional areas.

The following functions are considered beyond the scope of PennERA at this time although there may be data exchanged between these systems and functions.

• Indirect Cost Proposal
• Space Management systems
• Payroll systems
• Human Resources systems
• Animal procurement
• Delivery of content for purposes of compliance training

1.8. Terms

For a better understanding of specific terms used throughout this document, please refer to APPENDIX A: RFP Glossary
2. PennERA Functional Requirements

2.1. Goals of PennERA

The University of Pennsylvania has long recognized the importance of academic research to the overall mission of the institution. Over the last decade, the University has become known as a world class research institution and during that time, the amount of research funding to the University has increased dramatically. Due to increasing scrutiny from both the public and private sectors, policies governing research have become increasingly complex. It has become imperative to facilitate the management of those research funds in a manner that does not inhibit the goals of the researcher and the University, yet is responsible to the directives of our sponsors.

The University of Pennsylvania has identified the management of sponsored research as a mission critical to its operation. In order to assist the University faculty and staff to manage sponsored projects, the University will develop an institution wide information system. This system, as our research, must be ‘best in class’ and should be an asset to the University for many years into the future.

The primary goals of PennERA are as follows:

- Reduce administrative overhead for both faculty and staff.
- Provide secure access to authorized users.
- Provide a University-wide data source for proposals and awards.
- Improve overall management and delivery of the administrative portions of sponsored research.
- Standardize proposal preparation and award management processes across the University.
- Increase efficiency
- Support the collaborative nature of research at Penn
- Enhance the ability to obtain funding
- Mitigate risk for the University
- Improve service to the faculty, staff, sponsors and management at Penn

2.2. Product Functions
The PennERA solution proposes an enterprise-wide electronic research system which would unify distributed processes and systems across the campus, eliminating redundant or non-value added processes within each school or center that would not be present centrally. The system is intended to provide a full range of electronic services from initial identification of funding opportunities to final award closeout and historical reporting. The high-level functional areas include:

- Proposal Preparation
- Protocol Preparation
- Routing and Approval
- Proposal Submission
- Award Management
- Billing and Receivables
- Reporting

In summary, the general functions of PennERA system must provide the following:

- Must be web-based and support both PC and MAC based clients.
- Access must be secure; only authorized users able to view proposal/award information. Authorization must be able to be set at the user, department, school or University levels.
- Must support the collaborative nature of research at Penn.
- The PennERA interface must be intuitive and friendly.
- PennERA must be flexible to accommodate the changes in both the way research is conducted (multi-disciplinary, multi-investigator) and how research is monitored (financial and regulatory).
- PennERA must be comprehensive to include all types of grants, funding mechanisms and sponsors.

2.3. General Requirements

The PennERA system product functions, whether they be part of one system or multiple integrated systems, are described in the Product Functions section for each functional section. This section describes general requirements, not specific to any one functional module.

REQ:2.3.1. PennERA shall be Web-based and accessed via University-supported Web browser programs.
REQ: 2.3.2. PennERA shall support PC- and MAC-based clients.

REQ: 2.3.3. Access shall be for secured users only, authenticated through the University’s authentication system of record.

REQ: 2.3.3.1. The system must enable any University of Pennsylvania faculty member, staff or student to access any or all of that user’s data.

REQ: 2.3.3.2. The system must provide the ability for authorized users to view all financial, administrative and technical information on a sponsored research proposal or award. The exception is that co-investigators and their related BA’s should have access to only their portion of the project.

REQ: 2.3.4. The system must support any number of Co-PI’s and Co-Investigators and their related BA’s to be associated with a proposal or an award.

REQ: 2.3.5. Encryption technology shall be applied to all data transmitted between the client and the server.

REQ: 2.3.6. PennERA shall be available to all registered PennERA users. A proposal/award shall be viewed only by the PI who originally submitted the proposal, by the (internal only) supporting proposal development team members, and by others authorized to view proposals/awards under development as defined in PennERA system.

REQ: 2.3.7. The system shall have a consistent, easy to use, GUI interface.
   • The system should not require more than a minimal amount of training for a PI and/or BA to be able to create a proposal and submit it for review.

REQ: 2.3.8. The system shall provide an easy to use online help function.

REQ: 2.3.9. The system shall support a single number to reference a proposal/project throughout its life, whether or not it is awarded.

REQ: 2.3.10. The system must support the management of data describing the project, its participants, sponsor and other information currently captured on the Research Services Transmittal Form and Account Information Sheet or their equivalents in the new system.

REQ: 2.3.11. The system must support grants awarded by the following sponsor types:
   • Federal government
   • Other governmental
   • Corporate
Their respective areas of focus include:
- Research
- Clinical trials
- Private Organizations
- Foundations
- University Research Foundation – University of Pennsylvania fund

REQ:2.3.12. The system must support multi-disciplinary awards, program projects and center grants.

REQ:2.3.13. The system must support the tracking and control of multi-year proposal and awards, including those with multiple funding increments and multiple funding cycles.

REQ:2.3.14. The module must support the following types of awards:
- Competing
- Non-competing
- Conditional
- Training awards
- Revisions
- Supplements
- Fellowships
- Internal Awards
- Clinical trials
- Modular
- Program Projects
- Center Awards
- Contracts
- Unsolicited funds for research

REQ:2.3.15. The system must reasonably validate and verify any material prepared for submittal in either electronic or paper form to a sponsor.
- Proposal documentation
- Interim/progress reports
• **Final reports**

REQ:2.3.16. The system must support the validation to sponsor specific business rules. This could include:
  • **F&A caps**
  • **F&A terms**
  • **Salary caps**
  • **Restricted expenditures**
  • **Cost sharing**
  • **Allowable employee benefit rates**

REQ:2.3.17. The system must support distributed generation of various documents – billings, reports, and forms.

REQ:2.3.18. The system shall support the storage and retrieval of text documents used for proposals and awards.
  • **The application must be the official database of record for submitted proposal and sponsor deliverable (financial, technical, etc.) information. Rules would be developed for archiving information from the PennERA system.**
  • **The application must support the upload of documents into the database. Loaded documents could be stored in a prescribed common format such as rich text format.**
  • **The application may also have to support the scanning of documents for upload into the database if documents are stored.**
  • **The application must support the identification and retrieval of text documents by key words.**

REQ:2.3.19. The system shall support date driven ‘ticklers’ using free-form text for notification of impending deliverables, milestones or other actions necessary for the management of awards.

REQ:2.3.20. The system must be able to accept feeder files from, and to send feeder files to, other University systems of record as needed.

REQ:2.3.21. PennERA must be able to store information for all proposals and awards currently on record, whose financial activity is tracked using the GL system and chart of accounts currently in use at the University since 1996.
  • **Information may be required for awards predating the current GL application, prior to 1996.**
3. Proposal Preparation

3.1. Goals

All proposals for externally or internally funded research consist of scientific and administrative information and are presented in a format(s) typically defined by the sponsor or the University. Although the formal process which a Principal Investigator uses to build his/her proposal may be unique to the PI or his/her School, it always involves creating the high-level scientific abstract, identifying resources to be used in the research, one or more protocols if applicable and developing the detailed budget and budget justification information related to the project. The PI or his/her School will engage and coordinate all relevant personnel in completing this effort.

Interviews and surveys have shown that the current process for preparing proposals for grants is inadequate for the volume of research the University conducts. Although there are related systems that provide information, there is no system currently supporting the preparation process itself. An automated Proposal Preparation system has been identified as a high priority item in the PennERA system.

The goals for this component of the new system are to:

- Reduce time associated with developing proposals.
- Provide standardization in proposal preparation across the University.
- Reduce errors in proposal preparation.

3.2. Product Functions

The PI for a given proposal is the primary focal point for the science and budgetary data within. He/she is ultimately responsible for the completeness of the content of the proposal and will require participants in his/her grant to be thorough in the form and content of the documents they submit.

The process for creating a proposal for submission to a sponsor for funding is typically sponsor specific; that is, each sponsor has their own forms and format for proposal information.

Unlike many processes in research, the development of a proposal is non-linear. Depending on the information available, the preference of the PI or BA, different portions of the
proposal are completed in different orders. This module must support the ‘flat’ process of creating a proposal as well as supporting the collaborative nature of research proposal preparation.

The Proposal Preparation module must include the gathering and presentation of information that is currently in the form of the following documents or their information equivalents.

**Transmittal form** – An internal form used by the University of Pennsylvania to capture general information about the project as well as capturing the signatures of all approvers. The transmittal form includes information pertaining to:

- PI/Co-PI on the project
- Responsible organization
- Type of project
- Type of proposal
- Title
- Sponsor
- Start/End dates
- Direct, Indirect and shared costs
- Subcontractor information
- Facilities
- Regulatory information including protocol numbers
- Approval certifications

**Sponsor face page** – Sponsor specific document providing general project information. This document requires the Investigators signature as well as the signatory authority of the University.

**Scientific abstract** – A sponsor specific text that describes the project in general terms. The length of the documentation varies by sponsor.

**Salary** - All personnel salary figures, includes salary caps and employee benefits.

**Detailed budgets** - Except for proposals with modular budgets, and for non-competing continuations that follow the streamlined non-competing award process (SNAP), budgets are
usually detailed for the first year with subsequent years estimates at a category level. Detailed budgets include but are not limited to the following items.

Salary Expenses – Includes base salary, level of effort, requested salary, requested employee benefits and total salary expense.

Travel & training expenses

Supplies

Equipment and/or Capital Expenditures

Contracts - Expenses associated with services provided directly to the University as it executes the research project.

Subcontracts - Expenses associated with work performed on behalf of the university in direct support of the research effort. Subcontracts are typically treated as a separate project within the contracted University or institution.

Budget justification – If required, this text details the need for certain budget items as well as explaining any unusual budget requests.

Biographical sketches for all key personnel – Sponsor specific text outlining the qualifications of key personnel on the proposal. The length of the documentation varies by sponsor.

Current and pending support for key personnel (except for proposals with modular budgets) – Text describing current and future commitments by key personnel on the proposal.

Resource page – Sponsor specific text describing the suitability and availability or physical resources needed for the project.

Proposal checklist – For NIH proposals only. This is a list of attributes that enables NIH to classify the project internally.

Subcontracts – Information on any subcontract agreements in which a material portion of the work will be accomplished by another institution or organization. This includes any ‘pass-through’ entities and percentage of Federal funds.
Cost Sharing – The amount and source of any costs of the research borne by the University rather than the sponsor.

Program Income – If applicable, a description of any program income to be realized from a competing or non-competing continuation.

Protocol information (if not part of the transmittal form) – If the protocol is ready and approved, its name, number and approval dates only are required. Otherwise, the submitter must know whether or not approval is pending and if so, when it is expected to be approved.

Contract and/or contract requirements when necessary. Includes the terms and conditions of any contracts or master agreements.

Consultant/collaborator letters – If applicable, letters confirming the consultant/collaborator role in the project.

Waiver documentation – If applicable, a Penn internal text explaining any policy exceptions, or general comments on the proposal.

In summary, the Proposal Preparation module must provide the following functions.

- Support all types of sponsored research including Federal, other governmental, private, internal and clinical trials.
- Support the creation of multi-year, multi-investigator, multi-disciplinary proposals and the collaboration necessary to create and maintain those proposals.
- Provide a secure environment for creating and maintaining proposals.
- Support sponsor specific proposal requirements and document templates for the top 90% of sponsors by proposal count and dollar amount as well as generic proposal requirements.
- Provide verification and validation of information that is part of a proposal, ensuring it conforms to both University and sponsor rules where appropriate.
- Use the University database of record for information where applicable.
- Allow authorized users to view the status of all documents that are part of a proposal.
- Allow authorized users to electronically view or print the contents of any documents that are part of a proposal.
- Support electronic submission for routing and approval.
• Enable “turn over” of budget information to Penn’s post-award processing systems

3.3. Requirements

The following is a list of detailed requirements for the Proposal Preparation component of the PennERA system.

REQ:3.3.1. A proposal shall be validated and verified for completion before it can be submitted for internal approval and submission to a sponsor.

• Portions of the proposal may be incomplete at time of internal approval submission. This includes the protocol information and the scientific abstract.

REQ:3.3.2. The proposal development module shall allow a proposal to be developed by any authorized faculty member, staff, or student.

• Only the PI or his/her supporting BA can submit the proposal for review.

REQ:3.3.3. The proposal development module shall allow EDI submission if the sponsoring agency support it and optionally allow a hardcopy proposal, using the sponsor’s format, to be submitted via courier.

REQ:3.3.4. The proposal development module shall provide the ability to work on a proposal and save it to be continued later.

• This includes the ability to download documents associated with a proposal, edit them locally, save and upload them to the PennERA server.

REQ:3.3.5. The proposal development module shall provide the ability for authorized users to view all information on a proposal

• While in development or after rejection from an approver (read/write)

• After submission for review (read only)

• After submission to the sponsor (read only)

REQ:3.3.6. The proposal development module must support proposals, including forms, for top federal sponsors (by $ and count) and provide the ability for authorized users to print a proposal on sponsor specific forms or a Penn generic form at any time

• NIH

• NSF

• Dept. of the Army

• Dept. of Education
PennERA RFP

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- Dept. of the Navy
- NASA
- USDA
- Dept. of Energy
- Dept of Veterans Affairs
- National Endowment for the Humanities

REQ: 3.3.7. The proposal development module must support proposals, including forms, for top foundation sponsors (by $ and count) and provide the ability for authorized users to print a proposal on sponsor specific forms and/or upload to sponsor websites or alternatively, print a Penn generic form at any time
- American Heart
- American Cancer
- Juvenile Diabetes
- Robert Wood Johnson
- Whitaker
- Arthritis FDN
- Mellon
- Muscular Dystrophy Association

REQ: 3.3.8. The module must support proposals, and forms, for top corporate sponsors (by $ and count) and provide the ability for authorized users to print a proposal on sponsor specific forms or a Penn generic form at any time
- SmithKline Beecham
- Bristol Myers Squibb
- Merck
- Pfizer
- Lilly
- Novartis

REQ: 3.3.9. The proposal development module shall provide the ability to maintain revisions to proposals and awards.
- *Only revisions to submitted proposals will be maintained historically. The application will need to store the original proposal as submitted to the*
sponsor and any revisions made to the proposal after submission. The same is true if and when the grant is awarded.

REQ:3.3.10. The proposal development module shall provide the ability to reopen a proposal for revision upon notification from the sponsor

- Electronic notification that a proposal needs to be revised
- Other notification (e-mail, phone call, letter etc.)
- Revised protocols must be reapproved, but each person on the approval list may set a rule so their approval is automatically given to revised proposals. See Section 5.

REQ:3.3.11. The proposal development module shall support the recording of all correspondence or interactions pertaining to a proposal/award between the University and the sponsor.

REQ:3.3.12. The proposal development module shall support the inclusion of template University profile information, maintained centrally, that can be included with each proposal.

REQ:3.3.13. The proposal development module shall support the development of proposals external to the sponsored projects system.

- The application needs to support an easy method of a central or school user taking a hard copy proposal and entering it into the new system.
- Provides for data entry of proposal information if PI cannot produce proposal electronically through the application. Provides a facility for scanning or otherwise importing completed proposal forms and documents produced using applications other than the ERA application. This would include scanned images, electronic documents (word processing, spreadsheets, etc.). Imported documents and files would need to be associated with the proposal record; they should be readily accessible through the Penn’s ERA application.

REQ:3.3.14. The proposal development module shall support the ability to copy parts of other proposals or awards for inclusion into a new proposal.

- Security must insure that the developer of the proposal (PI or Co-PI) can only copy from other proposals they have submitted.

REQ:3.3.15. The proposal development module shall support the validation to specific University business rules.

- Examples could include that the salary budget should equal the sum of the detail of the salary budgeted.
REQ:3.3.16. The proposal development module shall support free-form text associated with each proposal.
  • Notes associated with concerns by approvers or other types of information.

Transmittal Form

REQ:3.3.17. The system shall support the collection of data describing the project, its participants, responsibilities and other information currently captured on the Research Services Transmittal form. This could include but not be limited to the following:
  • The probability of the proposal being accepted for award.
  • Information on space being used from the SPAN system. This would include the building(s) and lab(s) where research is to be conducted.

REQ:3.3.18. The system shall support the use of sponsor specific face pages for PennERA supported sponsors and a generic face page for non-supported sponsors.
  • Sponsor whose forms are not supported by PennERA and that do not accept a generic form will have to have their forms completed manually.

REQ:3.3.19. The system shall support the development of sponsor specific scientific abstracts for PennERA supported sponsors and a generic abstract for non-supported sponsors.
  • Sponsors may limit the length of any text input as part of their proposal guidelines.

Salary

REQ:3.3.20. The system shall provide University salary data for all personnel named in a proposal.

REQ:3.3.21. The system shall support the calculation of salary support based on sponsor specific salary caps.

REQ:3.3.22. The system shall support the ability to override any and all system generated salary information.

REQ:3.3.23. Must limit the review of salary information to a need-to-know basis.
  • An investigator can only see their own salary and all other salary access shall be controlled by the equivalent of org-level access.

Budgets
REQ:3.3.24. The system shall support the development of detailed budgets. The application shall support the preparation and maintenance of multi-year budgets.

REQ:3.3.25. The system shall support production of detail budgets at the object code level or category level for the first year and subsequent years of a proposal.

- Budget revisions that come from the sponsor need to be flagged immediately. Users will have to reallocate the budget based on these revisions from the sponsor and reroute for approval.

- If a notice of award is received electronically and object code level budgets agree with the award budget, the budget will be loaded into FinMIS, the University’s General Ledger, when an award is received. If there is a difference the system must recognize that and notify the appropriate parties that the budget must be revised before loading into FinMIS.

- Note: To be loaded into FinMIS, budgets must be completed at the object code level.

REQ:3.3.26. PennERA supported sponsors category definitions and descriptions shall match the sponsor’s category definitions and descriptions.

- The application must support the creation of sponsor specific category definitions that list for each category the FinMIS object codes to be included in that category.

REQ:3.3.27. The system shall support the entry and maintenance of personnel information when the identity of the person(s) is unknown.

- The application must support personnel information in the form of job classifications if the identity of the person(s) associated with the proposal is unknown. This may include salary data from external systems or the proposed solution.

- The system must support the reclassification of personnel.

REQ:3.3.28. The system shall provide the ability to optionally apply an ‘inflation’ factor to budget amounts from the first year to each additional year within a project.

REQ:3.3.29. The system shall provide the ability to calculate the following amounts based on sponsor limitations.

- Modified Total Direct Cost (MTDC)
- Direct and indirect costs
- Graduate Assistant and Tuition costs and caps

REQ:3.3.30. The system shall provide University template information including:
• Animal care costs, per-diem per animal from template. Maintained separately in the ULAR system.

• F&A Rates

• Employee Benefit (EB) Rates

REQ:3.3.31. The system must support the creation and calculation of modular budgets.
  • Specifically, NIH modular budgets must be supported.

**Budget Justification**

REQ:3.3.32. The system shall support the development of sponsor specific budget justification for PennERA supported sponsors in a free-form text format.
  • Sponsors may limit the length of any text input as part of their proposal guidelines

**Biographical Sketch**

REQ:3.3.33. The system shall support sponsor specific biographical sketches for all key personnel and a generic biographical sketch for non-supported sponsors from the database of record for this information.
  • Must support sponsor specific biographical sketch formats for those that require them.
  
  • Must be able to limit text based on sponsor requirements
  
  • Must provide the ability to edit (add/modify/delete) biographical sketch information to tailor to a specific proposal or sponsor.
  
  • Biographical sketches; faculty will be responsible for maintaining their biographical information. The application must allow the user to over-ride bio information when appropriate.
  
  • This may include an interface to a Penn faculty profile, r commercial database or functionality provided as part of the ERA solution.

**Current and Pending Support**

REQ:3.3.34. The system shall support the generation and maintenance of current and pending support for key personnel where applicable from existing proposal and grant information.
  • Generate other and pending support from data within the PennERA system
  
  • Personnel workload, both current, pending and planned, the system must recognize when a researcher is overloaded and allow for adjustments.
• Based on the date of the current proposal and other proposals that overlap the current proposal dates. The exception to this would be a ‘K Award’.

• Provide the ability to modify (add/edit/delete) other and pending support generated from PennERA data

Resources

REQ: 3.3.35. The system shall support the creation and maintenance of a resource page where applicable.

REQ: 3.3.35.1. The system shall support the use of generic resource templates that describe common resources at the University but can also be saved and modified at the PI, department or school level.

• Include animal facilities, lab space, library descriptions, clinical resources, core facilities

REQ: 3.3.35.2. The system shall support the use of generic equipment templates that describe common resources at the University but can also be saved and modified at the PI, department or school level.

REQ: 3.3.35.3. The system shall support tracking space usage for projects. This includes type of space, new space, existing space, renovations to space, equipment installations etc.

Checklist

REQ: 3.3.36. The system shall support the creation and maintenance of PennERA sponsor supported proposal checklists.

Subcontracts (Penn as the institution contracting research to another institution)

REQ: 3.3.37. The system shall support the creation and maintenance of subcontract information associated with a proposal.

• Includes any pass-through of Federal funds

• Letter of intent from subcontractor

• Subcontractor budgets

• Association of vendor numbers and vendor sites to a proposal

Cost Sharing

REQ: 3.3.38. The system shall support the creation and maintenance of cost sharing
information including the following:

- Amount and source. *The source must include the 22-digit account number for tracking cost sharing commitments.*
- Voluntary and mandatory
- *Cost sharing information must be maintained in a manner that will allow the application to provide notification and approval mechanisms.*

**Program Income**

REQ:3.3.39. The system shall support the creation and maintenance of program income information for competing and non-competing renewals.

**Contracts**

REQ:3.3.40. The system shall support the maintenance of contract information and requirements if applicable.

REQ: 3.3.40.1. The contract information shall include but not be limited to:

- *Terms and conditions of contracts*
- *Negotiation history by proposal*
- *Master agreements by sponsor*
- *Types of contracts*
- *Corporate Clinical trials*
- *Industry contracts*
- *Federal Contracts*

REQ: 3.3.40.2. The system shall be to identify contracts and route to approvers outside of the normal approval list.

- *CTT and Legal may need to review contracts with sponsors.*

**Consultants**

REQ:3.3.41. The system shall support the creation and maintenance of consultant and collaborator information indicating participation in the project.

**Waiver Documentation**

REQ:3.3.42. The system shall support the creation and maintenance of waiver
documentation, if applicable.

- Text document that includes general comments on a proposal and any policy exceptions for the proposal.

**Protocols**

REQ:3.3.43. The system shall support the association of any or all of the following protocol information to a proposal if applicable

- Protocol approval letter
- Pending status letter
- Approved protocol number
- Protocol
- Copy of letter of intention to submit a protocol for review
4. Protocol Preparation

4.1. Goals

A protocol describes a process used to conduct research. Protocols may describe the safe and responsible use of human or animal subjects for research or may describe the use of materials that require special handling or precautions when there are no human or animal subjects directly involved in the procedure. A protocol involving humans or animals is reviewed by the IRB or IACUC boards respectively. The review boards are managed and administered through the Office of Regulatory Affairs. A protocol describing research not involving humans or animals is reviewed by OEHRS only. The results of a protocol review are typically necessary for a proposal to be considered for approval by a sponsor and are included in the proposal submission. A typical protocol includes a face sheet, the protocol, and possibly a consent form. In addition, amendments and addendum can be added to a protocol during the course of its use.

Interviews and surveys have shown that the current process for preparing and managing protocols is inadequate for the volume of research the University conducts. An electronic Protocol Preparation system has been identified as a high priority item in the PennERA system.

The goals for the Protocol Preparation component of PennERA are as follows:

- Reduce time associated with developing protocols.
- Provide standardization in protocol preparation across the University.
- Support the use of Master protocols and instances of protocols
- Reduce time for reviewing protocols.
- Help ease increasing regulatory burden on University offices.
- Support the use of recognized and approved procedures to be incorporated into a protocol.
- Provide electronic versions of protocols for review.
- Use the University database of record for information where applicable.
- Provide information on training and certification of personnel on a proposal or award.

4.2. Product Functions

The Protocol Preparation module would enable a PI, a Co-PI or a collaborator to create a protocol online either by uploading protocol documents to the PennERA system or creating
the protocol entirely within PennERA. As part of this process the investigator would be able to include common standard approved methods used in research as part of the protocol. When the protocol is completed the investigator could submit the protocol for review internally, within their school if applicable, and then to the proper regulatory offices. The routing path would be determined by attributes assigned to the protocol by the investigator while preparing the protocol ‘face sheet’. PennERA must also support protocols that do not involve human or animal subjects. These protocols are associated in most cases to proposals that are or expect to be funded but they do not require the review from an IRB or IACUC board but do require approval from an OEHRS committee. The Protocol Preparation module must also support the use of consent forms, amendments and addendum to protocols.

The protocol would be routed for approval in the same manner that a proposal would be routed. If the approver has rules to review protocols that approver would need to review and approve before the next approver in the approval list could act on it. The protocol would also be routed to ORA and OEHRS, if necessary, depending on the attributes of the protocol. Within ORA a protocol would be assigned to a board and scheduled for review, either expedited or full board, within the PennERA system. All correspondence concerning the protocol will be created from within the PennERA protocol module and will be stored in an electronic format. Correspondence to the investigator can be completed by either hardcopy, email, or notification within the investigators PennERA ‘inbox’.

The PennERA Protocol Development module will provide the capability to generate all correspondence to the investigator which would include approval letters, notification that a protocol is due to expire, preliminary approval letters, adverse events letters, and letters to sponsors where applicable, etc. In addition, the PennERA Protocol Development module will allow protocols to be assigned to boards for review.

The Protocol Development module will provide electronic copies of protocols and their associated proposals to board members once a protocol has been assigned to a board. Board members can review protocols and associated documents online and in some cases be able to comment on protocols electronically.

The PennERA Protocol Development module will provide board members with agendas, both online and hardcopy, for each meeting based on the protocols scheduled for review as well as minutes, both online and hardcopy, for each meeting with actions noted. Adverse events can be associated to a protocol by the ORA staff or researchers in the field.

In summary, the Protocol Preparation module must provide the following functions.

- Support all protocols for the use of human and animal subjects in research and protocols for the use of hazardous materials where human or animal subjects are not used.
- Support the use of multiple investigators and key personnel named on a protocol.
- Provide the ability to associate a protocol to a proposal or award.
• Provide a secure environment for creating and maintaining protocols.

• Provide verification and validation of information ensuring it conforms to University, government, and sponsor rules where appropriate.

• Allow authorized users to view the status of all documents that are part of a protocol and its associated proposal/award. For the protocol this includes the face sheet or its equivalent, the protocol, consent forms if applicable, amendments and addendum.

• Allow authorized users to electronically view or print the contents of any documents that are part of a protocol and its associated proposal/award.

• Support linking of multiple protocols.

• Support the use of standard, approved techniques to be incorporated into a protocol.

• Provide electronic distribution of protocol and proposal materials to regulatory offices and review board members.

• Support electronic polling of board members for protocol review and providing the ability to add comments to protocols if necessary.

• Support tracking of training and certification by PI within PennERA.

4.3. Requirements

The following is a list of detailed requirements for the Protocol Preparation component of PennERA.

REQ:4.3.1. The system shall support printing of complete protocol materials for IRB/IACUC and OEHRS review.

REQ:4.3.2. The system shall support the creation and maintenance of a protocol face sheet for both human and animal protocols.

• PennERA must capture enough attributes of the protocol to allow routing to the proper regulatory offices. These are both attributes of the proposal and the protocol.

REQ:4.3.3. The system shall support the ability to create a protocol within the PennERA system. This includes both human and animal protocols.

REQ:4.3.4. The system shall support the ability to upload a protocol to the PennERA system for review by authorized users.

• The system shall support the ability to submit a protocol for review, electronically, and route the proposal to the proper reviewers and regulatory agencies.
• Proper reviewers could include anyone internal to the faculty’s school or center identified in an approval hierarchy if rules are applied that indicate the user wants to review the protocol.

• Routing to regulatory offices would be based on attributes assigned to a protocol by the investigator developing the protocol.

REQ:4.3.5. The system shall support the creation and maintenance of protocols that are not associated with a proposal but can be associated with a proposal or award at a later date.

• Protocols not associated with proposal must be able to be routed for review just as protocols that are associated with a proposal.

REQ:4.3.6. The system shall support the association of any or all of the following protocol information to a proposal if applicable

• Protocol approval letter and other letters
• Pending status letter
• Approved protocol number
• Protocol
• Copy of letter of intention to submit a protocol for review
• Consent form
• Amendments
• Addendum

REQ:4.3.7. The system shall support the use of a protocol template for human and animal protocols.

• IRB protocol templates are currently under consideration.
• IACUC currently uses a protocol form, completed by the investigator, as the protocol.

REQ:4.3.8. The system shall support the use of Master Protocols for initial protocol development and approval.

• Master protocols define the technique and investigator.

REQ:4.3.9. The system shall support the use of protocol instances for the execution of a protocol for a particular grant.

• The protocol instance defines the use of a protocol for a particular grant or contract.
REQ:4.3.10. The system shall support the ability to grant access to complete protocol and related proposal materials to IRB/IACUC board members.

REQ:4.3.11. The system shall support the assignment of protocols to review boards and initial and primary reviewers.

REQ:4.3.12. The system shall support the ability to print review board agendas and minutes.
- PennERA must provide the functionality included within the Penn Protocol Manager system.

REQ:4.3.13. The system shall support the ability to generate IRB/IACUC letters for protocols as well as email versions of the same letters.
- Letters are based on the status of the protocol and other actions and attributes on the protocol record.

REQ:4.3.14. The system shall support the ability to query the status of any protocol which the user is authorized to view.

REQ:4.3.15. The system shall support the use of pre-approved techniques and procedures for inclusion within a protocol.
- This could include University approved methods for standard procedures such as anesthesia, blood withdrawals, or surgical procedures.

REQ:4.3.16. The system shall support the ability for authorized users to do key word searches of protocols and protocol abstracts.

REQ:4.3.17. The system shall support the ability to submit a protocol for review, electronically, and route the proposal to the proper reviewers (based on approval list) and regulatory agencies (based on attributes assigned to the protocol).

REQ:4.3.18. The system shall support linking multiple protocols together under one protocol.
- There is a need for linking protocols similar to the way that projects are linked under a program project.

REQ:4.3.19. The system must be able to identify any and all protocols used at any time during the lifetime of a project, and any and all protocols used during a particular segment of time within the project (such as a funding cycle or a budget period).

REQ:4.3.20. The system must provide information on training of all personnel named on a proposal or protocol and be available to authorized PennERA users.
- Information needed would include the type and date of training.
- It is proposed this information would be available from a central University Research Training database.
5. Routing & Approval

5.1. Goals

All proposals for externally funded research must be approved by University officials, who will ensure compliance with University and funding sponsor regulations, guidelines and policies. In addition, the University reviews proposals for adherence to federal and state laws and the mitigation of business risk. This process entails routing the main components of a proposal to various faculty and staff within the University, typically to receive a signature from a reviewer before the proposal is routed to the next reviewer. In most cases this routing is strictly hierarchical, moving from a primary investigator (PI) to a business administrator (BA) to the department chair to a senior business officer (SBO) for a school/center and eventually to the Dean and centrally to the Office of Research Services. Review and approval is necessary from all or some of reviewers for the University to be confident to allow the proposal to be submitted under the University’s name.

Interviews and surveys have shown that the current process for tracking and approving proposals for grants is inadequate for the volume of research the University conducts. PI’s or administrative staff often hand carry proposals around campus for signatures of approval, often spending hours a week waiting for reviewers as deadlines approach. The current process has proven to be inefficient, cumbersome and, at times, makes it difficult to meet sponsor deadlines. An automated approval and routing system has been identified as a high priority item in the PennERA system.

The goals of the system described are as follows:

- Reduce ‘pipeline’ time for proposals. This is the time from when a proposal is first submitted for review until the University’s central signatory authority officially approves it.
- Provide non-refutable approvals and rejections.
- Provide secure access to proposals and protocols to authorized PennERA users.
- Ensure timely routing of proposal and protocol information to regulatory offices.

5.2. Product Functions

The approval and routing process begins when a PI or his/her supporting BA submits a proposal and/or protocol for approval. Prior to submission, the proposal is validated as having all of the necessary data elements and/or documents completed and verified. The description of this process is defined in the Proposal Preparation Functional Requirements.

When the PI submits a proposal for approval, it is routed to all reviewers/approvals on the approval list, which may involve multiple hierarchies. Filters will allow the
reviewers/approvers to view only proposals that need action, all proposals or proposals that meet other criteria. Multiple hierarchies must be supported due to the collaborative nature of research at the University. The main approval hierarchy is the one designated for the Responsible Organization for the entire proposal and is the approval hierarchy that will eventually route the proposal centrally to ORS for final review and approval. The Responsible Organization is the organization submitting the proposal to the sponsor. When multiple hierarchies are involved, the approval list includes a secondary hierarchy for each department where one or more of the named investigators has his or her primary academic appointment. A secondary hierarchy may be the hierarchy for the department where the principal investigator has his or her primary academic appointment if that department is not the Responsible Organization for the proposal. Within any approval hierarchy, the proposal will not be routed for approval to level n + 1 until all primary approvals have been received at level n.

Any number of approvers can be designated at any number of review/approval levels. Approvers are designated also as primary approvers or delegated approvers. A primary approver is the one that is ultimately responsible for reviewing and approving a proposal at a given level in the approval hierarchy. A delegated approver may review proposals as a proxy for the primary approver when the primary approver requests it, or when a proposal has not been reviewed by the primary approver(s) within a school-defined time frame.

The rejection (or disapproval) of a proposal by any approver will cause the proposal to be routed back electronically to the supporting BA and the PI. The proposal will also be made available in their respective Inbox. Preparing a proposal is often a collaborative process between the investigator and the business administrator and access to the proposal during the development and amendment phases must reflect that relationship.

Reviewers will be notified by E-mail when proposals are awaiting review, and will find those proposals in their PennERA Inbox that they will access when they log into PennERA.

Comments may be attached to any proposal by any reviewer in the approval hierarchy.

The final academic approver of any proposal is the Responsible Dean. All approvals, both academic and administrative, in all the hierarchies included in the approval list, must be completed before the Responsible Dean can approve the proposal. The final step is the central review and approval of the proposal by the Signatory Authority for the University in the Office of Research Services.

A protocol can also be routed for approval as part of a proposal or independent of any proposal or award. Data attributes that are part of the protocol face sheet will identify any regulatory agencies where a protocol should be routed. The protocol, if associated with a proposal will be routed independent of the proposal. For example, if the approval list for a protocol is shorter than the approval list for the proposal associated with it, the proposal queue will not interfere with the routing of the protocol. At all times the protocol and
proposal can be linked logically within the PennERA system so a protocol reviewer can view the proposal and a proposal reviewer can view the protocol at any time.

In summary, the Approval and Routing module must provide the following functions.

- Allow an investigator or their supporting BA to submit a proposal, protocol or report for review by predefined list of reviewers and approvers (the approval list).
- Allow a reviewer to view all documents and/or information pertinent to the review of the proposal.
- Allow a reviewer to print any and all of the documents and/or information pertinent to the review of the proposal.
- Allow the maintenance of approval and routing hierarchies.
- Allow an override of any approval and routing hierarchy by central approvers.
- In the event of an override of an approval and routing hierarchy, allow the option for a reviewer to be notified when a proposal, protocol or report is automatically approved (and include the reason/rule).
- Allow any number reviewers on any number of levels between the PI and ORS.
- Provide for the delegation of reviewer authority in case of absence of the primary reviewer(s) for a pre-determined period of time.
- In the event of a rejection of a proposal, notify the supporting BA and, at their discretion, the PI.
- Provide secure access to proposals.
- Ensure that a proposal, protocol or report may be approved only by those designated on the approval list for that proposal.
- Provide non-refutable proposal approval.
- Ability to expedite the approval of any proposal by a school and/or the Office of Research Services.
- Ability to route a protocol with a proposal for review. This would include the protocol face sheet and protocol itself.
- Ability to route a protocol not associated with a proposal or award.
- Provide the ability for regulatory agencies to approve the protocol online with access to the entire protocol and proposal if applicable.

5.3. Requirements

REQ:5.3.1. A proposal shall be validated for completion before it can be submitted for approval.

- Portions of the proposal may be incomplete at time of submission. The science and scientific abstract may be modified while the proposal is being routed, but a version of the abstract must be included in the submission for
approval.

REQ:5.3.2. The system shall support the definition and maintenance of organization-based approval hierarchies, listing reviewers and approvers.
  
  • Approvers must be University employees.

REQ:5.3.3. The system shall support the use of review/approval profiles for each reviewer and approver.
  
  • This would include the rules that a given reviewer sets up as acceptance criteria for proposals for their review.
  
  • Acceptance criteria would include rules for routing to that approver.

REQ:5.3.4. The system shall support the routing of proposals on multiple, simultaneous paths (approval hierarchies) based on the Responsible Organization and the primary academic department of all named investigators for the project.
  
  • Penn’s current approval scheme appears to be linear, with one approval needed before it goes to another office for approval

REQ:5.3.5. The system shall support multiple reviewers and approvers at any level.

REQ:5.3.6. The system shall support any number of levels of review within an approval hierarchy.

REQ:5.3.7. A proposal shall be submitted for approval only by the principal investigator or their supporting Business Administrator.

REQ:5.3.8. When a proposal is submitted for approval, the status of the proposal shall be such that all fields and documents associated with it are read only.
  
  • Changes can be made only by the principal investigator, their supporting Business Administrator or a central administrator. When a proposal is modified, other than the scientific abstract of the scientific detail, the proposal must be rerouted for approval.

REQ:5.3.9. The principal investigator shall have the ability to create an ad hoc route for review purposes only. The investigator shall be able to define which items from the routed information can be viewed.
  
  • This will allow the principal investigator to route the proposal to someone other than the primary and secondary reviewers for information purposes. The ad hoc reviewer has no approval authority in this context.
  
  • Salary information can never be viewed in an ad hoc routing scheme.
REQ:5.3.10. The system shall support rules based routing for any proposal submitted.

- A typical use may be routing within a school or department based on factors such as:
  - Total dollar amount requested
  - Whether graduate students are or are not involved
  - Sponsor
  - Funding mechanism
  - Competing vs. non-competing renewals.
  - Space requirements
  - The presence of cost sharing information.

REQ:5.3.11. The system shall support the use of meta-rules to resolve conflicts with rules-based routing rules.

REQ:5.3.12. The system shall provide the ability to track the status of all proposals during the review period.

- The PI and others must be able to determine where the proposal is and who has and has not reviewed it.
- In the event of a rejection, the BA and the PI must be notified via email of the rejection as well as the reason

REQ:5.3.13. The system shall notify reviewers via E-mail that they have proposals to be reviewed.

REQ:5.3.14. Authorized reviewers shall also notified of pending reviews when they logon on to PennERA.

- A scenario could be an ‘In Box’ that consists of proposals that need review.

REQ:5.3.15. The system shall support the ability for an approver to specially flag a proposal and override any implicit approval rules that subsequent reviewers may have in place.

- A scenario might be that although a Dean has a rule in effect to implicitly approve all proposals with no cost-sharing, a BA may want to bring a given proposal to the Dean’s attention for other reasons

REQ:5.3.16. The system shall support filters to allow an approver to see all proposals that are currently in their approval In Box.

- Proposals that are for review only, and proposals that are ready for them to review for approval. Approvers should also be able to see all the proposals
in their Out Box, proposals they have implicitly approved due to a specific rule that has been applied, proposals they have explicitly approved, and proposals they have rejected. For proposals that have been implicitly approved, the system will provide an optional notification mechanism to identify these proposals and the reason they were automatically approved to an approver.

REQ:5.3.17. A proposal shall be routed to all approvers on the approval list in each approval hierarchy once it is submitted.

REQ:5.3.18. Each approver shall have the ability to add comments to a proposal. All comments will be viewable by all reviewers with the hierarchy. Comments can be marked as public, available to everyone in the approval list or private; available only to the person creating the comment.

REQ:5.3.19. A proposal shall be routed to the principal investigator and the supporting business administrator if any approver rejects the proposal.

REQ:5.3.20. All approval hierarchies shall begin with an organization and end at the Office of Research Services.

REQ:5.3.21. The application shall support expedited review of proposals. The Office of Research Services shall have the capability to approve or reject any proposal regardless of the level where the proposal is currently in the approval hierarchy.

REQ:5.3.22. Each school/center shall have the ability to expedite the approval of a proposal within the approval hierarchy of that school/center regardless of the level the proposal is currently in the school/center approval hierarchy.

REQ:5.3.23. The system shall ensure that all approvals and rejections are non-refutable.

REQ:5.3.24. The system shall support the automatic delegation of approval authority to the delegated approver if the primary approver does not act on a proposal within a school-defined number of days/hours.

REQ:5.3.25. The system shall provide an audit trail of each milestone in the routing scheme and shall support the following reports:

- Accumulated queue time by approver for each proposal.
- Report must account for central users with many proposals in their queue due to larger approval responsibilities.
- Accumulated queue time for all proposals by approver.
- Report must account for central users with many proposals in their queue due to larger approval responsibilities.
• This should include any information such as date/time stamps when a proposal was made available to a reviewer, when the reviewer completed the review, etc.

REQ: 5.3.26. The system must support functionality to warn a user submitting a proposal for approval within a University defined period before a proposal due date that the submitted proposal may not be reviewed in time to meet the sponsor’s deadline.

• The system should provide a visual warning that submitting the proposal too close to the deadline may result in the proposal not being reviewed in time.
6. Proposal Submission

6.1. Goals

A major component of the PennERA system is the Electronic Data Interchange (EDI) and proposal submission. Federal agencies are beginning to mandate the use of electronic systems for the submission and management of research grants. Several agencies, with the Office of Naval Research and the National Science Foundation at the lead, are or will be requiring the electronic submission of proposals within the next two years. The National Science Foundation’s Important Notice #123 outlines these goals and stresses the importance of working toward paperless proposal and award systems. All federal sponsors will be accepting research proposals and reports by other means such as EDI, XML or HTML data streams that will allow the submitting institutions to retain the information locally for reporting and historical purposes yet still submit proposals, reports and other information electronically. The Federal Commons initiative is designed to act as a clearinghouse for all forms of electronic submission of research information from research institutions. A new consortium of non-Federal foundations, the Foundations Commons has recently been formed to follow the model of the Federal Commons. The Foundation Commons will also be accepting electronic submissions within the near future.

The goals of the system described are as follows:

- Reduce time associated with submitting proposals.
- Allow both electronic and mail/courier submission of proposals.
- Support electronic confirmation of proposal receipt from sponsor.
- Provide on time submissions and timely processing of award notification.
- Provide secure exchange of electronic data between the University and sponsor organizations.

6.2. Product Functions

The Proposal Submission module will consist of two methods of submission to sponsor agencies; electronic submission and paper submission.

When a proposal has been completed and has all of the necessary internal approvals for submission to a sponsor the PI or their designee will have the option of either submitting the proposal electronically or to print a hard copy(s) of the proposal for submission by mail or courier.

Some sponsors will support both methods of submission but the Federal government is rapidly moving to electronic submission as the preferred method. To the Federal government, electronic submission could be either EDI, XML or HTML data streams or using one of their web based applications such as NSF’s FastLane. From the University’s perspective, if the use of PennERA is to be encouraged, using a web based application would in fact be redundant.
since it is assumed that all of the data captured in FastLane or any application like it, already resides within PennERA. Therefore it would be in the PI’s best interest to select electronic submission or a hardcopy courier submission using the PennERA system rather than submitting the proposal directly through the sponsors web-page.

Using the electronic submission method, the PI or their designee would submit a proposal using data aggregated and formatted from the PennERA system into a format, either EDI, XML, or HTML datastreams, and be transmitted to the sponsor organization for consideration. The second method of submission would allow the PI or their Business Administrator to print proposal documents on sponsor specific forms or University of Pennsylvania generic forms if the sponsor permits their use and submit the proposal by mail or courier.

In summary, the Proposal Submission and electronic submission modules must provide the following functions.

• Support EDI and/or HTML datastream and/or XML proposal submission for sponsors who support it.
• Support printing proposals on sponsor specific forms for hardcopy submission to sponsors.
• Support the translation of data elements into ANSI transaction sets.
• Support the ANSI 194 transaction set for proposal submission.
• Support the ANSI 850 transaction set for Notice of Award.
• Support the ANSI 997 transaction set for acknowledgement of proposal receipt by sponsor.
• Support the ANSI 102 transaction set under the 4020 standard for submitting binary files.
• Provide a secure environment for submitting proposals to sponsors that includes Distributed Computing Environment (DCE) based authentication and encrypted data transfer.
• Supports transmission of the technical proposal content without compromising format, appearance, scientific notations or graphics.
• Provide flexible configuration options to allow PennERA to support other types of transaction sets or submission types as they become available.

6.3. Requirements

REQ:6.3.1. A proposal shall be validated and verified for completion before it can be submitted to a sponsor electronically.

REQ:6.3.2. The application shall make the digital copy of the submitted/revised proposal, the proposal of record, available to secured users at all times.
REQ: 6.3.3. The application shall support electronic submission of proposals to those sponsors that will accept them.
- Proposed formats for electronic submission include EDI (ANSI 194 Transaction Set) and XML.

REQ: 6.3.4. The application shall support electronic acknowledgement of receipt from sponsors that support them.
- The current EDI standard for acknowledgement from sponsor is ANSI 997 transaction set.
- Currently this is for proposal submissions but could include reports and other electronic file transfers as the sponsor permits.

REQ: 6.3.5. The application shall support the submission of binary files using the to those sponsors that support them.
- The 4020 standard will support the ANSI 102 transaction set for transferring binary files. This will be necessary for the technical portions of proposals and will include scientific notation, graphics and other formatting.

REQ: 6.3.6. The application shall support electronic receipt of Notice of Award from those sponsors that support them.
- The current EDI standard for Notice of Award is ANSI 850 transaction set.

REQ: 6.3.7. The application shall support hard copy printing of proposals using sponsor templates.
- Many sponsors will not support electronic submission so manual submission must be supported.
- If a sponsor does not have a regular form, the proposal will be submitted using Penn’s generic templates.

REQ: 6.3.8. The application shall ensure the integrity and confidentiality of electronic submissions.
- This would include the handshake between sending and receiving systems, encryption, and digital signatures for any files passed between parties.

REQ: 6.3.9. The application shall track all proposal submissions and other electronic correspondence with the sponsor for audit purposes.

REQ: 6.3.10. The application shall record the date, time and method of all electronic submissions and all electronic acknowledgements (TS997) from the sponsor.
- This would include proposals submitted electronically, acknowledgement from sponsor, Notice of Award, reports submitted electronically or any other
electronic correspondence from the sponsor.
7. Award Management

7.1. Goals

Once an award notification has been received, either by the Department, by Research Services or both, a research project is ready to begin. Certain tasks must be completed initially to ensure proper general accounting, budgeting (as part of the University’s annual process as well as the project proposal process), billing (for non letter-of-credit projects) and Accounts Receivable records are in place to manage the administrative aspects of the project. It is necessary to have information to properly track interim sponsor deliverables and to manage and control project resources over the life of the award. Other important tasks involve effective coordination of effort certifications – to ensure compliance with sponsor agreements - and management of cost-sharing portions of projects. Each project must be able to cooperatively develop and track its final deliverables to its sponsor, to freeze funds, close out accounts and properly adjust financials to facilitate project close-out.

Functional requirements gathering has identified that the current processes need to be more effective, timely and efficient, with particular emphasis on award set up, Billing and AR, project budgeting and expense tracking, Effort Certification tracking and tracking sponsor deliverables.

The goals of the system described are as follows:

- Minimize the amount of time and redundant data entry associated with setting up the award for general accounting, billing and budgeting.
- Simplify the effort associated with entering budget information into the University’s financial systems as well as internal control reporting through the use of sponsor-defined templates.
- Reduce manual reviews of non-LOC billings.
- Improve overall coordination and handling of Clinical Trial billings and receivables between local and central activities.
- Reduce outstanding receivables' volume with resulting improvement in cash flow.
- Eliminate unallowables from sponsor billings.
- Improve means to manage unallowables and, thereby, reduce involuntary cost sharing.
- Reduce effort associated with obtaining and validating effort certifications.
- Ensure delivery of sponsor interim and final reports in a timely way.
- Ensure that record of all financials and project deliverables be capable of being audited to facilitate project close out.
- Improve content as well as accuracy of information used to manage awards within the University.
- Provide better information for budgeting potential awards in future fiscal years.
7.2. Product Functions

Research Services typically receives a NOA from the sponsor. This action triggers the award set up process, wherein accounts for revenue and overhead expense tracking in the GL and information necessary for proper billing and AR are set up in the appropriate systems. If the type of award is a Clinical Trial, PennERA will require any milestones that will be relevant for billing later on.

It is likely that the PI or his/her supporting BA may receive a copy of the NOA as well. In either case, if the sponsor has made any final changes to the terms of the original proposal submitted by the PI, Research Services will reflect the same in their records and the supporting BA will make the appropriate changes to the budget, as required. The proposal and its related records – including the budget - are ready to move from proposal to award status. To facilitate this set up effort, as much information as possible will be obtained from the pre-award records to automatically populate post-award records.

Any relevant purchasing activity (such as, purchase orders for subcontracts, contracts, equipment, supplies, etc.) may be initiated by the PI or BA as required by the project.

As a project progresses, subsequent administrative changes – to staff, PI, period of performance, budget, overhead or EB rates, reporting schedules, etc. are reflected in the contract and related records by Research Services and the PI/BA for the department(s) executing the research. These updates will be reflected within the PennERA database. As expenses are incurred and project actuals are created, these will continue to be posted to the University’s financial system and will be tracked through various systems and reports, as they are today. In addition, new report capabilities will be provided via PennERA to enable viewing financials using the same cost categories the sponsor defined for the original budget that was submitted.

Adjustments precipitated by errors or contract changes will continue to be made in the University’s financial systems, as necessary. However, to improve the management of cost sharing situations, the PI and/or BA will review planned, encumbrance, actual and remaining funds on a monthly basis for all months in the grant year. Future spending by month will be projected based on a calculation of remaining funds divided by remaining months. This is also expected to facilitate “what-if” planning done by BA’s.

PennERA project budgets will be available to support the University’s annual budgeting process. PennERA will be the source for project budgets. For proposed projects, the system will have a “probability of award” feature which will serve to prioritize projects – and the value of their funds accordingly -within the School/department as well as at the University level.
The opportunity to improve the task of effort reporting will be addressed two ways:

1. An online process will be developed to reduce the “sneaker net” associated with gathering information from project participants.
2. PI’s and/or departments will have supporting reports comparing staff percent effort against Payroll.

PennERA will detect unallowables prior to billing. This will reduce the need for accounting adjustments later on as well as reduce the effort for Contract Administrators prior to the billing going to the sponsor.

Interim reports due to the sponsor are generated as required today. System capabilities to track the due dates as well as completion of these deliverables (in the case of Clinical Trials, contract “milestones” will be tracked in addition to any reporting requirements) will be provided by PennERA.

All project expenses will be billed accordingly, if the sponsor is a non-LOC account. Billings will be automatically screened for unallowables to ensure proper billing to the sponsor and reduce administrative effort associated with manual reviews done today. By extending support for creating billings to offices in the schools, the ability to match payments to billings will be greatly enhanced, helping to reduce outstanding AR balances and improve the University’s cash flow.

At project close, all unliquidated obligations are reviewed by the BA and brought to closure with the PI and appropriate members of the project staff – including subcontractors. Any remaining mistakenly charged unallowables will have been identified as mentioned earlier. Any remaining, final adjustments to the financials – due to indirect cost rate changes, for example - would be handled at this time.

Finally, the process of completing all project deliverables (financial, technical, patent and property reports) in a timely way will be enhanced by PennERA capabilities for tracking due dates and recording completion. An electronic copy will be stored. The collection of these records in the PennERA database will serve to support not only project close-out but audit activities as well.

In summary, the Award Management module must provide the following functions.

- Support all of the types of sponsored research including Federal, other governmental, private, internal and clinical trials.
- Support the tracking and control of multi-year, multi-investigator, multi-disciplinary research projects.
- Provide a secure environment for tracking and controlling the administrative aspects of
the University’s awards.

- Support sponsor specific budget and reporting requirements via use of sponsor-defined templates for the top 90% of sponsors by award count and dollar amount as well as generic award requirements.
- Support a common template for situations where no sponsor specifications exist.
- Provide for acceptance of original information from the pre-award systems.
- Provide for acceptance of actual and encumbrance information from existing University financial systems.
- Provide visibility for managing cost-shared portions of projects.
- Support requirements for providing effort for annual certifications.
- Improve staff resource planning capabilities through better use of effort information.
- Provide verification and validation of information ensuring it conforms to both University and sponsor rules where appropriate.
- Use the University database of record for information where applicable.
- Allow all authorized users to view the status of all reports that are part of an award’s deliverables.
- Allow all authorized users to electronically view or print the contents of any documents that are part of an award.
- Support handling non-LOC billings - including billings for Clinical Trials - and set up of scheduled payments.
- Provide accounting and management support for receivables associated with billable items, scheduled payments and Clinical Trials.
- Support distributed printing of billings.
- Provide visibility for internally reporting space utilization as well as various aspects of regulatory compliance on grants.
- Support funds availability checking by any grouping of segments within an account number.

7.3. Requirements

Award Set Up

REQ:7.3.1. The system must allow the recognition of an award; manually or programmatically.

- *Manual intervention would be required if a Notice of Award is received by some other method than EDI.*

- *The system must allow the total award amount to be allocated to one or more award accounts.*
REQ: 7.3.2. The system must accept all relevant information from a proposal to the award and support making changes/adjustments to the award as defined by the final award agreement with the sponsor.

- Changes may include but not be limited to PI name, start date, overhead rate, employee benefit rate, value of individual budget categories, value of total award, total billable amount, responsible organization, etc.

REQ: 7.3.3. The system must be able to submit budget information from a proposal to the University’s financial system after the budget has been reviewed for compliance with the terms of the award.

REQ: 7.3.3.1. The system must utilize sponsor-defined templates to categorize University object codes into the sponsor’s financial category groupings.

REQ: 7.3.3.2. The system must allow a user to provide object code detail to category level budgets when an award is realized.

- Budgets can be submitted during the proposal process at the category level but must be detailed at the object code level for recognition in the University’s financial system.

REQ: 7.3.3.3. The system must validate that the total budgeted amount equals the sum of its details and also the award amount. If there are differences, the system must provide error notification.

REQ: 7.3.4. The system must support rules that would determine the correct revenue and overhead expense parents for each new fund being set up in the University’s financial system.

REQ: 7.3.5. The system shall notify via email and the PennERA user’s ‘in-box’ all proposals for which NOA’s have been received as well as the status of all proposals, whether accepted, rejected or otherwise.

REQ: 7.3.6. The system must be able to support the management and use of advance accounts via online notification and approval process as advanced accounts are requested.

- The notification and approval process would rely on a subset of the project’s approval list for routing.

REQ: 7.3.7. The system shall provide a means of tracking future year support as specified in the Notice of Award.

- The University needs to track future proposed and future committed funds.
Billing and Receivables

REQ: 7.3.8. The system must support the Billing and Receivable process by tracking and creating billings for all awards based on terms defined by the award, tracking payments, and making adjustments as required during the life of the project for the following award/payment types.

- Installments
- Cost Reimburseable
- Milestone
- Letter of Credit (LOC)
- One-time cash payment

REQ: 7.3.8.1. The system must track when invoices are to be created and when scheduled payments are expected.

- The due dates for both types of receivables may be manually entered or may be computed based on specified intervals.

REQ: 7.3.8.2. The system must create and track invoices consecutively by fund, and only for those accounts who receive invoices.

REQ: 7.3.8.3. The system must accumulate charges and bill them if the account is setup as billable, or post and track them if the account is setup as LOC, as defined by the agreement with the sponsor.

- For newly awarded grants and contracts, it is necessary to include charges incurred against advanced accounts and to handle them accordingly.

- For awards/accounts with change in payment status (whether billable or LOC), it is necessary to ensure the change is applied appropriately within the system, as well as to the University financial system (see also REQ: 7.3.11)

REQ: 7.3.8.4. The system must ensure that total billings do not exceed the total billable amount of the grant or contract, as per the agreement with the sponsor.

REQ: 7.3.8.5. The system must support creating billings either by fund or by award.

- “Award” level is a broader level of aggregating costs than “Fund” level.

REQ: 7.3.9. The system must support the maintenance of a sponsor address file.

- Multiple sponsor addresses must be supported with the ability to associate an address to a fund.
REQ: 7.3.10. The system must support a parent-child relationship between the “corporate” level of a sponsor and its “divisions.” Example: American Heart versus American Heart of SE Pennsylvania

REQ: 7.3.11. The system must be integrated with or capable of integrating with the University financials system (GL, Payroll) in support of capturing all current, eligible expense activity for billing, as well as submitting all collections activity.

REQ: 7.3.11.1. The system must provide the ability to drill down to view detailed expenses within a fund.

REQ: 7.3.11.2. The system shall provide the ability to calculate and query daily Letter of Credit (LOC) draw downs by agency and award and provide the ability to generate a report.

REQ: 7.3.12. The system must support other billing expenses for special services.
- *This would include items such as IRB fees.*

REQ: 7.3.13. The system must support maintaining pre-defined text for sponsor’s information on billings for a specific fund.

REQ: 7.3.14. The system must support distributed creation and printing of invoices as well as the ability to reprint any invoice for information only.

REQ: 7.3.15. The system must support electronic transmission of invoices and Letter of Credit reporting to those sponsors that support them.

REQ: 7.3.16. The system must support re-creation of an invoice as a correction to the original invoice and have the results reflected in the University financial systems as well.

REQ: 7.3.16.1. The system must provide a free-form text field so that invoice changes can be explained and tracked.

REQ: 7.3.17. The system must support online sharing of copies of billings, adjustment billings and payments to enable faster Accounts Receivable resolution.

REQ: 7.3.18. The system must provide a method for tracking checks sent directly to the University.
- *This information must be reconciled with the Cashier’s records of checks received.*

REQ: 7.3.19. The system must be able to apply payments to multiple invoices; it must be able to handle applying payments that are under, over or equal to the invoice amount.

REQ: 7.3.20. The system must track and age all receivables.
REQ:7.3.21. The system must be integrated or capable of integrating with the University financial systems to clear checks from suspense.

REQ:7.3.22. The system must provide adequate tracking of all invoices to be created, payments due, project-to-date amounts billed versus amounts budgeted for all awards, invoices by status or fund type, overdrafts and late expenses to ensure proper monitoring and control.

**Project Tracking**

REQ:7.3.23. The system must support revalidation of key administrative elements of the project whenever changes occur during the life of the project.

- *For example, the system must validate that a total budget being changed is in balance with its details.*

REQ:7.3.24. The system must alert the appropriate project participants whenever there is a change of funding.

REQ:7.3.25. The system must allow project-specific changes for overhead and EB rates.

- *E.g., when indirect cost (F&A) rates are renegotiated with the sponsor.*

REQ:7.3.26. The system must support maintaining information relevant to the “context” of an expenditure on an award.

- *This is a variation on the theme of setting up and utilizing sponsored-defined templates: Although costs are accumulated in the same generic cost category (or, in University terms, “object code”), they need to be reported differently, depending on the context in which they are incurred; for example, testing expenses must be categorized separately if they are incurred during the patient recruitment period (or “context”) versus during a subsequent stage of a clinical trial. Another example would be cost sharing of supplies – when are a portion of the supplies were funded by the University as part of the cost share agreement.*

- *If the default sponsor financial category for a detail line is incorrect, ORS Accountants must be able to correct it for that detail line.*

REQ:7.3.27. The system must be able to support accounting for funding from both internal and external (sponsor) sources.

REQ:7.3.28. The system must facilitate project cost management by providing advanced visibility to potential end of project overruns and “involuntary” cost sharing.
REQ: 7.3.28.1. The system must be able to project future spending by cost category by month.

REQ: 7.3.28.2. The system must calculate future months’ available funds as an even distribution of remaining funds across remaining months.

REQ: 7.3.28.3. The system must enable budget projections on a monthly basis for the current grant year and on an annual basis for future years in the grant.
- Users must be able to perform “what-if” analyses and have the system maintain the overall budget amount. The system must check that the amount has not been exceeded.

REQ: 7.3.28.4. The system must be able to support salary commitments/encumbrances based on employee or job classification.
- A commitment is monies set aside within PennERA but not encumbered within FinMIS.

REQ: 7.3.28.5. The system must support budgeting commitments that are recurring costs for a given period of time.

REQ: 7.3.28.6. The system must support commitments that are one-time costs.

REQ:7.3.29. The system must support the storage of budget and expense justification letters/comments in a free-form text format prepared by PI’s and/or BA’s as they make changes and adjustments during the life of the project.
- This information would also be used to support cost transfers between organizations.

REQ:7.3.30. The system must be able to identify and track program income.

REQ: 7.3.30.1. The system must be able to separate interest income from other forms of income so that it can be reported later to sponsors which incorporate this requirement in their agreement.

REQ:7.3.31. The system must be able to calculate the funds available for any grouping of monies identified by a Fund code, or by a Fund code and any subset of the segments of the account number, as specified by the user.

**Effort Reporting**

REQ:7.3.32. The system must provide a Web-based means for entering effort information online (by employee, by project, for a given period of time).

REQ:7.3.33. The system must ensure compliance with respect to reporting of effort to
sponsors and the direct charging of effort.

- Capture both voluntary and committed cost share percentages.
- The system must be capable of projecting future expenditures as well as compare actual monthly effort to effort paid by individual or by project.

**Space Reporting**

REQ:7.3.34. The system must have the ability to maintain space information as defined in Requirement REQ:3.3.17, during the life of a project.

- An extract relating projects to space would be created for import to SPAN and the Indirect Cost Proposal (CRIS).

**Sponsor Reporting**

REQ:7.3.35. The system must enable the University to meet sponsor financial, administrative and technical reporting requirements.

- Depending on sponsor requirements, reports must be generated by fund or by award.

REQ:7.3.36. The system must support proactive, early notice of reports due, as required by sponsor/award.

REQ:7.3.37. The system must support different date submission requirements for various kinds of reports for each sponsor.

REQ:7.3.38. The system must provide the ability to record when sponsor reports have been submitted, by whom and when.

REQ:7.3.39. The system must provide the ability to capture an electronic version of all reports for project close-out.

REQ:7.3.40. The system must support the electronic submission of reports if and when the functionality is available.

REQ:7.3.41. The system must support automatic routing for report approvals using the approval list for that award.

- Rules based routing would allow reports and other documents to be included or excluded from a reviewers responsibilities.

REQ:7.3.42. The system must provide a means for defining approval rules for reports based on sponsor and type of report.
Project Close-out

REQ: 7.3.43. This system must support the capability to ‘freeze’ activity against a fund.

- **Stopping future expenses from being charged to fund accounts, both during the life of the project and after the account end date.**

- **Stopping expenditures in certain budget categories, by object code (i.e., specifically limiting no further spending in these categories, even if there are residual funds available at the end of the project)**

- **Facilitating fund freezes by source (i.e., having a capability which prohibits transaction input from other IT systems based on the project’s end date within PennERA)**
8. Reporting

8.1. Goals

Various forms of reports are required to support PennERA functionality in general. These cover the period from the proposal stage through award, award management and finally, project close-out. They encompass external (sponsor) as well as internal reporting requirements. And, they cover a wide range of needs from detail to summary reporting as well as ad hoc query capabilities, in batch or online.

The goals of the reporting functions are as follows:

• Provide accurate, consistent and timely information to manage proposals and awards within the University.

• Enable central analysis, planning and control of proposals and awarded projects at the higher management levels within the University.

• Facilitate project delivery as well as decision-making at all levels of the University, as appropriate.

• Provide single-source reporting through integration with other University data repositories, as required.

8.2. Product Functions

The reporting module of the PennERA system must support a variety of reporting scenarios and requirements. These will support monitoring the development of proposals in progress, managing the approval and routing of proposals, tracking electronic submission of proposals, managing awarded projects through project close out, understanding process bottlenecks, understanding award success rates, controlling unallowable expenses and, finally, reporting historical data to enable analysis and planning.

In summary, the PennERA Reporting module must provide the following functions.

• Support all of the types of sponsored research including Federal, other governmental, private, internal and clinical trials.

• Support the tracking and control of multi-year, multi-investigator, multi-disciplinary research projects.

• Provide a secure environment for tracking and controlling the administrative aspects of the University’s awards.

• Support sponsor specific budget and reporting requirements and related templates for the top 90% of sponsors by award count and dollar amount as well as generic award requirements.
• Support a common template for situations where no sponsor specifications exist.
• Integrate with other University data repositories, where appropriate, in order to present a single source for sponsored project reporting.
• Provide the ability to “drill down” into project/budget details, where required.
• Provide canned queries and reports, where required.
• Provide the ability to submit parameter-driven reports.
• Provide detailed and summary reports, where required.
• Provide exception reporting, where required.
• Support “what if” reporting capabilities for analysis and planning purposes.
• Provide ad hoc reporting capabilities.
• Provide the ability to “slice and dice” data.
• Provide the ability to either present information graphically or export information to tools that can present information graphically.
• Support Boolean logic within selection criteria.

8.3. Requirements

REQ:8.3.1. The module must provide user-friendly, pre-defined and ad hoc query facilities including:
• Table-driven selection criteria where appropriate
• Easy searches and sorts on fields

REQ:8.3.2. The module must support the easy export of report and query data to common file formats, such as spreadsheet, .CSV or .TXT files for reporting or graphical presentation on a variety of desktop platforms.

REQ:8.3.3. The Reporting module must support an easy to use ad hoc query tool that will allow secured users to create, copy, change, execute and save queries run against the PennERA database.

REQ:8.3.4. The module must support the use of Boolean logic in creating selection criteria for all types of reports.

REQ:8.3.5. The module must be able to “slice and dice” data by multiple attributes with drill down capabilities.
REQ:8.3.6. The module must support “what if” analysis to enable high-level analysis and planning.

REQ:8.3.7. The module must support:
- Grant year reporting
- Sponsor (fiscal) year reporting
- (University) Fiscal year reporting

REQ:8.3.8. The module must be able to use most of the PennERA table elements associated with any proposal or awarded research project.
- Examples: School, Sponsor, Responsible Org, Proposal Due Date, Submission Date, Anticipated Start Date/Proposed Start Date, Proposal Type (e.g., modular/non-competing continuation Research, projects, Fellowships, clinical trials, contracts, etc.), Proposal or Program Type Qualifiers (e.g., Fixed Cost Proposal, Contract, Grant, cooperative agreement, etc.), Sponsor Type, Cost Sharing, F&A Rate, Animal uses, Human uses, Subsponsor (e.g., the Cancer division within NIH), NIH Designated Department (an NIH-standard name for a department at Penn), NIH Program Type (a.k.a., “Funding Mechanism;” .e.g., P01, P05, P10, R01, R029, etc.), PI/co-PI, Dollar amount, Direct Costs, Indirect Costs, Radioactive Materials use, Purpose (e.g., Research, Training, Student Aid, etc.), Grant year, Fiscal year, gender, race, Conflict of Interest check, Protocol #, OEHRS criteria, other special use categories (to be identified)

REQ:8.3.9. The module must be able to list all proposals & awards by their status or stages of development (i.e., proposed, awarded, advanced account, in development, in review or submitted to the sponsor).

REQ:8.3.10. The module must be able to produce reports based on any attributes in the protocol management database for either human or animal protocols or both.
- The module must be able to relate protocols to proposals and awards to satisfy Agency compliance reporting requirements.
- The module must be able to provide batch letters for re-approvals and out of status protocols.

REQ:8.3.11. The module must support the following reporting requirements during the proposal preparation, approval and routing, and proposal submission phases:
- General Proposal Report – Using the selection criteria defined in REQ:8.3.8, the module must provide a general proposal report. Audience: Central University Management & School Administrators.
• **Total Time in Queue by Reviewer** – A summary of total time all proposals have been in queue for each reviewer. Audience: Central University Management & School Administrators.

• **Total Time in Queue by Proposal** – Total time in each reviewer’s queue by proposal or for a specific proposal. Audience: Available to anyone in the approval list for that proposal.

• **Rules by User** – Prints approval and routing rules by PennERA user. Audience: Available to anyone in the approval list for that proposal.

• **Approval List by Responsible Organization** – List of all approvers associated with a Responsible Organization. Audience: Available to anyone in the approval list for that organization.

• **Approval List by Proposal** – List of all approvers associated with a given proposal. Audience: Available to anyone in the approval list for that proposal.

• **Proposal Status Report** – Status of all proposals currently submitted within the approval and routing system. Select by Proposal, or Responsible Organization, or sponsor, or status, or “all.” Audience: Available to anyone in the approval list for that proposal.

• **Proposals Awaiting Award** – List of all proposals which have been submitted to sponsor(s) and are awaiting award. Select by status and by sponsor. Audience: PI, Central University Management, School Administrators.

• **Internally Rejected Proposals by Reason Code** – List of all proposals by log# which have been rejected by an internal reviewer; reviewer’s name, reason for rejection (these will be pre-defined reason codes). Audience: School Administrators and Central University Management.

• **Aging of Proposals Against Due Dates** – List of all proposals, their due dates and remaining amount of time to complete from today’s date, sorted by remaining amount of time, lowest to highest. Audience: BA’s, School Administrators and Central University Management.

• **Analysis of Proposal Throughput** – Number of proposals for a given responsible organization or department processed within a certain period of time. Audience: BA’s, Central University Management and School Administrators.

• **Proposals Submitted Electronically By Date** – A listing of all proposals submitted electronically by date or date range and their current status and other information. Audience: ORS and IT.

REQ:8.3.12. The module must support the following reporting requirements during the award management and post-project phases:

• **General Award Report** – Using the selection criteria defined in REQ:8.3.8,
the module must provide a general award report. Audience: Central University Management & School Administrators.

- Proposals by amount submitted versus amount approved - List for a given sponsor or subsponsor, over a period of time. Audience: BA’s, School Administrators and Central University Management.

- Non-Standard F&A Costs – All awards with non-standard indirect cost rates by any organization, or by PI, or by sponsor. Audience: Central University Management, BA’s and School Administrators.

- All F&A Costs – F&A costs for all awards by responsible organization, or by PI, or by sponsor. Audience: Central University Management, BA’s and School Administrators.

- Unallowable Expenses – Report for correction of any expenses incurred that are unallowable and effect the department’s sponsored funds. Audience: Central University Management, School Administrators, PI’s, BA’s and ORS.

- Awards – Awards received in a specified time period. Summarized by school and responsible org/dept. Audience: Available to anyone in the approval list for that award.

- Cost-Sharing – All awards where cost sharing is indicated. Indicate amount of cost share and total cost share by summary criteria or by source (i.e., school or department). Audience: BA’s, School Administrators, Central University Management and Center Management.

- Sponsored Projects: Budgeting Probabilities Report – This report is intended to support annual budgeting efforts in PILLAR. It will use the “probability of award” percentage identified in the pre-award process for all projects that are not yet awarded and will calculate the sum of their total value. It will identify projects that will be within a department’s budget based on overall budget $ limitations and prioritized “probability of award.” Audience: School Administrators, PI’s, BA’s, Central University Management and Center Management.

- View of Sponsor Reports Status by PI – For use by the Research Services, the PI or the BA; all awards under a PI’s responsibility, showing award, deliverable, deliverable due date, deliverable status. Items past their due date should be highlighted. Sort by PI, due date, award. Audience: ORS, PI’s, BA’s and School Administrators.

- Query View of Completed Sponsor Reports – For use by PI/BA or ORS Contract Administrator; grant or sponsor-specific; shows award, deliverable report, sent by whom, date sent; links to Document Management system to retrieve copy of report. Audience: PI’s, BA’s, ORS.

- New Awards – New awards granted in a selected month. Audience: BA’s, School Administrators, Center Management and Central University
Management.

• Award Success Rates – Percentage of awards to proposals. Various selection and summarization criteria. May include sponsor, sponsor type. Audience: BA’s, School Administrators and Central University Management.

• Unmatched Payments Received – For use by ORS Billing and Receivables and BA’s to compare and resolve unmatched payments. Audience: ORS, Central University Management, School Administrators and BA’s.

• Interest Report – For use by ORS in tracking interest on various projects’ funds; show award, accounting period, amount of interest. Audience: ORS, BA’s, School Administrators, Central University Management.


• Cost Transfers by Project by Account – For use as an audit trail for particular accounts within a project budget. Audience: BA, PI.

• Budget Changes by Project – For use in maintaining a history of changes to a project’s budget for audit and control purposes. Audience: BA, PI.

REQ:8.3.13. The module must support sponsored project life cycle reporting.

• The module must be able to report project budget, actual, encumbrance and remaining amounts on a month-to-month basis for the current grant year and on an annual basis for future years of the same grant.

• The module must be able to report future commitments in any one of three ways:
  • Salary: As a simple division of the budget balance available divided by the # of remaining months and spread over the remaining months of the project in a given grant year unless salary is already encumbered for that period.
  • Recurring commitments: As an amount for a given period of time;
  • One-time commitments: As an amount at a single point in time.

• The module must be able to report remaining funds over each remaining month by evenly spreading the budget balance available for the specific budget line (object code) over the months remaining.

REQ:8.3.14. The module must support reporting which integrates research funds with non-restricted departmental funds to facilitate overall management of departments as well as the grants in which they participate.

REQ:8.3.15. The module must support budget variance reporting by grant or by PI for all grants during the life of a research project.
REQ:8.3.16. The module must support validating effort certification.

- This requires the system to be able to calculate current average percentage of effort for a given period of time from actual Payroll dollars and to compare the result to the employee’s percent of effort for the same period.

REQ:8.3.17. The module must support historical reporting: Proposal/award report – Proposal and/or award information including relevant financial/budgetary information, dates, sponsor, etc. Must be able to select by any combination of the criteria described in REQ:8.3.8.

REQ:8.3.18. The module must support system audit queries and reports.

- How many reports were in queue for “n” days.

- Tracking usage by user and departments
9. Technical Specifications and Infrastructure

The University of Pennsylvania has a distributed computing environment. To provide some background, this section includes an overview of the key components of the University’s existing technology infrastructure. This section also includes an overview of the University’s technical requirements and preferences when considering vendor products.

A. Key Components of Existing Technical Infrastructure

1. Networking

PennNet, the University’s enterprise-wide data communications network, connects the vast majority of campus buildings and offices. Connections to the Internet are also provided. Users access PennNet primarily through Ethernet on-campus (10/100 BaseT Ethernet) and PPP off-campus through commercial internet service providers. While the TCP/IP suite of protocols is preferred enterprise-wide for administrative applications and services (e.g. electronic mail), other protocols (e.g. NetBEUI) are used within and among workgroups and will continue to be reliably transported throughout campus to support workgroups that span campus subnets.

2. Desktop Standards

The University currently has a heterogeneous set of desktop platforms, which include Windows and Macintosh machines. Each year, the University publishes a new set of recommendations for new machines, for which it provides a 4-year period of support. The following two charts represent the range of minimum desktop configurations that the University currently supports for new machines and existing machines:

### Windows Computers

<table>
<thead>
<tr>
<th>Minimum Configurations for:</th>
<th>New Machines</th>
<th>Existing Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Windows 98 / 2000 / NT 4.0</td>
<td>Windows 98 / NT 4.0</td>
</tr>
<tr>
<td>Hardware</td>
<td>Processor</td>
<td>Pentium III (600MHz)</td>
</tr>
<tr>
<td></td>
<td>Memory (RAM)</td>
<td>256 MB</td>
</tr>
<tr>
<td></td>
<td>Hard Disk</td>
<td>20 GB (10 GB min.)</td>
</tr>
<tr>
<td></td>
<td>Monitor</td>
<td>17” Color SVGA, 75Hz refresh rate, 16 MB VRAM</td>
</tr>
<tr>
<td></td>
<td>Drive bays</td>
<td>4X DVD-ROM; ZIP</td>
</tr>
</tbody>
</table>
Macintosh Computers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of Recommendation for new machines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating System</td>
<td>MacOS 9.x</td>
<td>MacOS System 8.6</td>
<td>MacOS System 8.x</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor</td>
<td>PowerPC G4 (400 MHz)</td>
<td>PowerPC G3 (350MHz)</td>
<td>PowerPC 750</td>
</tr>
<tr>
<td>Memory (RAM)</td>
<td>256 MB</td>
<td>128 MB</td>
<td>64 MB</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>20 GB (10 GB min.)</td>
<td>9 GB EIDE/SCSI</td>
<td>4 GB</td>
</tr>
<tr>
<td>Monitor</td>
<td>17” Color SVGA, 75Hz refresh rate, 16 MB VRAM</td>
<td>17” Color, 75Hz refresh rate, 8 MB VRAM (15” minimum)</td>
<td>17” Color, 75Hz refresh rate, 8 MB VRAM (15” minimum)</td>
</tr>
<tr>
<td>Drive bays</td>
<td>4X DVD-ROM; ZIP</td>
<td>YR2000 compliant; 24X CD-ROM; ZIP</td>
<td>YR2000 compliant; 24X CD-ROM; ZIP</td>
</tr>
</tbody>
</table>

3. E-mail

The e-mail clients used on campus are all capable of exchanging simple text messages but vary in their user interfaces, editing features, addressing conventions, and ability to exchange complex attachments, such as spreadsheets and formatted word processing documents. The most widely used clients include Elm, Eudora, Messenger, the e-mail module of Netscape Communicator, and Microsoft's Outlook. In general, all e-mail clients at the University should offer strong support for Internet standards such as SMTP, POP3, LDAP directory service, and IMAP4.

4. Financial Management System (FinMIS)

The University of Pennsylvania's core financial system, which is comprised of three modules from Oracle’s suite of Government (Public Sector) Financial Applications: General Ledger, Accounts Payable, and Purchasing. This suite of applications is currently at release 10.7 in both character- and web-based (NCA – Network Computing Architecture) versions, with plans to upgrade to NCA version 11i. The database resides on a 6-processor IBM RS/6000-H80 with 4 GB of memory, running AIX 4.3.3. It utilizes an Oracle RDBMS, version 8i. The database is approximately 75 GB in size.

5. Data Warehouse

The University data warehouse, implemented in 1995, makes Penn's corporate data available to decision makers for query, analysis, and reporting. The Warehouse stores selected data from Penn's existing and new business systems, such as SRS (Students Record System) and FinMIS (the University’s financial system), sponsored projects and other data collections. The data is filtered, made consistent, and aggregated in various ways. Restricted to authorized individuals of the Penn community, Warehouse access does not require formal programming skills, and desktop tools such as Business Objects support analysis and reporting. A web-based reporting system developed in Oracle’s Web DB provides parameterized queries available to all financial users.

The University's Data Warehouse is an Oracle 7.3.4 relational database management
system (RDBMS) with plans to move to Oracle 8.1.6 in the Spring of 2001. The database resides on an eight-processor IBM RS/6000 H70 server with 8 GB of memory and over 100 GB disk space, running under AIX 4.3.3.

B. Technical Specifications

Vendor products will be evaluated against the following university standards, which take into consideration utilization of a multi-tiered architecture:

1. Technical Requirements and Preferences

- Web-based presentation, or “thin” client, preferred over “fat” client client/server configuration for multi-tiered architectures that serve a significant number of users
- Compatibility with the previously outlined slate of University-supported desktop platforms required
- TCP/IP suite of communication protocols to connect client and server(s)
- Data encryption required (Secured Socket Layer, or SSL) with 128-bit encryption preferred
- Strong authentication and authorization required (Kerberos or Secure ID preferred)
- Support for both Netscape and Microsoft browsers required
- Netscape Enterprise or Apache as the basis for middle-tier server software preferred
- UNIX (AIX 4.3.3 or higher) application server and data server operating system preferred. However, workgroup servers used exclusively for file and/or print services may run proprietary network operating systems (e.g. Netware, AppleShare. Operating systems tied to a single vendor's hardware platform not desirable for servers.
- On-line transaction processing (OLTP) capabilities required.
- Database product support of relational SQL queries required, with Oracle as the preferred relational database management system (RDBMS).
- The University prefers a solution involving only one RDBMS. Query and OLTP functions, however, do not necessarily need to reside in the same physical database. If a single RDBMS solution is not possible, the technical integration among the different products used must be seamless.
- Compatibility with Tivoli Storage Manager (TSM), UPenn’s standard backup/restore management facility required.
- Integration with UPenn’s Business Continuity policies required, including offsite recovery capability.
- Ability to extract data into a format compatible with Microsoft Office 2000 Suite.

2. General
• Only customization of purchased packages (i.e. administrative business applications) that is explicitly supported by the vendor for a package's useful life will be allowed. Packages from one or more vendors must be integrated with one another.

• In-house customization of public domain software will be permitted only after an assessment of life cycle costs, risks, benefits, and resource requirements is performed to insure that the customized software can be adequately supported.

3. **Required Interfaces**

This information is to be determined and depends on our assessment of third party solutions. However, the following lists a set of systems that have been identified for some degree of integration to PennERA.

- Payroll/Salary Management (employees, employee jobs, job classes, payroll distributions, employee payments, organization-based security) *In-house application*
- FinMIS (General Ledger, Purchasing, Vendors, organization-based security) *Vendor application*
- ULAR Polaris (Animal purchases) *In-house application*
- Position Inventory *In-house application*
- Penn’s Data Warehouse (various extracts) *In-house application*
- Training Databases (Environmental Health & Safety system, Technology Transfer system, human/animal subjects system, etc.) *In-house application*
- Center for Technology Transfer
- A21 System (Effort Certification reporting) *In-house application*
- University authentication system of record *In-house application*
- Student Financial Services *Vendor/In-house application*
- SPAN (space, buildings and rooms) (Export) *Vendor application*
- Student Record System *In-house application*
10. Critical Success Factors

The following items represent the Critical Success Factors for the PennERA project and, subsequently, the most significant measures in which the vendor’s product will be evaluated. These will determine how effectively the product(s) meet the needs of the University.

In addition to the product evaluation, the vendor’s viability will be evaluated based on the items mentioned within the Vendor Responsibility paragraph of Section Error! Reference source not found. Error! Reference source not found. of the RFP.

To improve the efficiency, effectiveness and overall usefulness of the University’s pre- and post-award grant management processes to Principal Investigators, their Business Administrators, related regulatory, school, and departmental staff, and Central University Management, the product must do the following:

1. Enable Faculty to spend more time on research by reducing the time required to manage the administrative portion of a research project.
2. Provide tools for better strategic and operational management of Penn’s increasing research portfolio.
3. Reduce the cost and effort associated with increasing regulatory compliance and accountability standards while striving to surpass those goals and requirements.
5. Increase cash flow for non-Letter of Credit awards.
6. Increase the efficiency with which the University manages the preparation, delivery and disposition of award documentation and deliverables.
7. Increase the efficiency with which funds are closed out.
8. Improve the University’s ability to manage business risk.
9. Effectively meet the University’s technical infrastructure standards.
10. Provide management reports and query capabilities to provide summarized and detailed data for strategic and operational management of research.
11. Appendices

APPENDIX A: RFP Glossary

**Acronyms & Abbreviations**

**BA**
Business Administrator. The individual in a school, center or department who is administratively responsible for the proposal or grant.

**CTT**
Center for Technology Transfer. The Center for Technology Transfer obtains and manages patents, copyrights, and trademarks derived from the University's academic and research enterprise. CTT creates relationships with industry to develop, protect, transfer, and commercialize intellectual property resulting from the University's research.

**EDI**
Electronic Data Interchange

**F&A**
Facilities and Administrative category of expenses; in the context of research, these are the same as indirect costs or overhead.

**IACUC**
Institutional Animal Care and Use Committee. The organization responsible for approving protocols involving animals (or animal materials such as blood, tissue, etc.).

**IRB**
Institutional Review Board. The organization responsible for approving protocols involving humans (or human materials such as blood, tissue, etc.).

**NOA**
Notice of Award. A document, sent by a sponsor to the University to notify the institution of funding and the terms of that grant to be given for a particular period. If the sponsor plans to support the project for multiple budget periods, the Notice of Award may also include information on the planned level of support for any future budget periods remaining in the funding cycle. See AWARD and FUTURE YEAR SUPPORT.

**OEHRS**
Office for Environmental Health and Radiation Safety; responsible for licensing investigators to perform procedures involving radioactive materials, carcinogens, infectious agents, or recombinant DNA.

**ORA**
Office of Regulatory Affairs. Organization responsible for administering the University of Pennsylvania’s program of compliance in the areas of human subjects and the care and use of animals in research.

ORS
Office of Research Services. Organization responsible for coordinating administrative aspects of research and for providing an effective, efficient process for the University as a whole.

PI
Principal Investigator. The principal investigator is the one individual who is ultimately responsible for the direction of the sponsored project. This includes responsibility both for the administration and financial control of the project, as well as for the technical execution of the research or training. See PROJECT LEADER.

SBO
Senior Business Officer

ULAR
University Laboratory Animal Resources. University Laboratory Animal Resources (ULAR) is responsible for the procurement, care and use of all University-owned animals used for teaching, research and testing as approved by the Institutional Animal Care and Use Committee (IACUC) and as mandated by federal law and regulations.

Definitions

ABSTRACT
This document presents the science of the research project and is usually written in layman’s terms. It is always in text form and the sponsor – usually by way of limiting the content to a number of words controls its format.

ACCOUNT
The term “account” has slightly different connotations depending upon where the term is used. An “account” in the ORS Billing and Receivables (B&R) System really represents a “fund”, which is uniquely identified by Fund Number. In the University’s General Ledger (GL), however, an account is identified by a 26-digit Account Number, which contains the Fund Number segment. Once the sponsor grants an award, at least one GL Fund Number is created for the award, at least one GL account is created for the fund (more than one GL account may be created with the same fund number), and a B&R “account” is created using the same GL Fund Number(s). Once an account is set up in both the GL and B&R systems, the award is referred to as a fund, and it is the unique Fund Number that is used to track receivables within the B&R system for each fund.

ACCOUNT NUMBER
26-digit number, comprised of 7 segments, used to identify the University’s FinMIS (GL)
accounts. The fourth segment, which contains six digits, is the Fund Number. ORS uses Fund Number, which always starts with the number “5” for sponsored projects (awards), to uniquely identify accounts in their B&R system. The layout of the 26-digit FinMIS account number is as follows (the last row represents the number of digits within the account number):

<table>
<thead>
<tr>
<th>Center Net Asset Class (CNAC)</th>
<th>Organization (ORG)</th>
<th>Budgetary Control</th>
<th>Fund Number (FUND)</th>
<th>Object Code (OBJECT)</th>
<th>Program</th>
<th>Center Reference (CREF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXX</td>
<td>XXXX</td>
<td>X</td>
<td>XXXXXXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

ACCOUNT PERIOD
The period for which a Fund Number is assigned to track financial activity for a sponsored research project. Depending on the sponsor’s financial reporting requirements, the Account Period may be identical to either the Funding Cycle or to a single Budget Period.

ADVANCE ACCOUNTS
These are accounts set up for the PI/BA before the award has been officially made. They may be set up as a result of a sponsor check being received, in which case they are considered to be notice of the award from the sponsor. Or, they may also be set up in the event the PI wishes to begin work based on verbal/preliminary assurances from the sponsor that the award is pending. In these cases, the PI notifies Research Services in writing to that effect and, with departmental and school sign-off, agrees to fund any expenses from the department/school budgets should the award not be granted.

APPROVAL HIERARCHY
A predefined hierarchy outlining the approval path required for a proposal originating from a given organization. Each organization (research center or department) will have its own routing hierarchy starting with the organization and ending with the central Office of Research Services. Any number of levels will be supported within any given approval hierarchy.

APPROVAL LIST
The list of approvals needed for a particular proposal. This involves one or more approval hierarchies. In addition to the hierarchy for the Responsible Organization for the proposal, the approval list includes the hierarchy for each department where one or more of the named investigators has his or her primary academic appointment.

The Approval List for any submitted proposal is constructed as follows:
• Begin with the Responsible Org approval hierarchy (whether the Responsible Organization falls within a school or is a multi-school center)
• If it is not already included, add the approval hierarchy for the department where the Principal Investigator has his/her primary academic appointment
• If it is not already included (as might be the case if the Responsible Organization is a multi-school Center), add the approval hierarchy for the department within the Responsible Dean’s school where the Principal Investigator has an additional academic appointment, (other than his/her primary one). (If the Principal Investigator has appointments in more than one department within the Responsible Dean’s school, the approval hierarchy would be determined based on which of those appointments pays the highest salary to the Principal Investigator.)

• If it is not already included, add the approval hierarchy for each department where any Co-investigator has his/her primary academic appointment.

• If the Responsible Organization is a multi-school center, and any co-investigator’s primary academic appointment is not in a department of a school that is part of the center, and that co-investigator has an additional academic appointment in a department of a school that is part of the center, and that department’s approval hierarchy is not already included in the approval list, add it. (If the co-investigator has appointments in more than one of the schools or departments associated with the center, the approval hierarchy would be determined based on which of those appointments pays the highest salary to the co-investigator.)

The approval list will include each approver only once. (For example, if the same BA supports multiple organizations on the approval list, the approval list will name that BA only once.)

{It remains to be determined whether the approval list for a training grant proposal is constructed in the same way as for other proposals, or whether additional review or approval is needed when faculty members (other than the investigators) are listed on the training grant proposal.}

**AWARD**

A general term for the financial support that a sponsor has agreed to provide for a specified period of time according to the terms of an approved grant or contract. See also FUTURE YEAR SUPPORT.

**AWARD AMOUNT**

The total amount that a sponsor has agreed to provide for a particular award (grant or contract) for a specific period of financial support. This amount may change over time for some funds when sponsor payments are added to the fund’s original award amount. The award amount for a fund may or may not be the same as its BILLABLE (PBIL) AMOUNT.

**BILLABLE (PBIL) AMOUNT (vs. AWARD AMOUNT)**

Represents the total billable amount for the fund over its lifetime. The billable amount is based on the award amount but may also include allowable carryover from prior budget periods for the project. The award amount, on the other hand, refers to a specific period of financial support. (For example, an award with a surplus of $30,000 in receivables over expenses from “budget period 1” and an award amount of $100,000 for “budget period 2” would have a billable amount of $130,000 to apply toward expenses for “budget period 2”).
**BILLABLE FUND/ACCOUNT**
Fund that requires submission of an invoice or reimbursement form (see definition of reimbursement form) to the sponsor before the sponsor will release payment.

**BILLING CYCLE/FREQUENCY/PERIOD**
Identifies how often the sponsor is to be billed for a particular fund according to the terms of the approved grant or contract (e.g. monthly, quarterly, on specific dates)

**BUDGET PERIOD**
The period for which a sponsor has made a payment or has guaranteed payment on its award and for which a budget of separately allocated expenses has been requested. A budget period is also known as a funding increment.

**CARRY-OVER**
From a FinMIS (financial) perspective, funding left over at the end of a funding cycle.
From a research perspective, funding left over at the end of a funding increment. There are two types: Unobligated balances and unliquidated obligations.

**CENTER**
An entity within the University that may or may not be affiliated with a school or department but can conduct research under a sponsored agreement.
There are three types of centers:
- A center that is part of an academic department; e.g., the Johnson Foundation (part of the Biochemistry & Biophysics department in the School of Medicine).
- A center that is part of a school; e.g. the International Center of Research for Women, Children, and Families (within the Nursing School)
- A center that works across Schools; e.g., the Center for Cognitive Neuroscience (which includes investigators from the School of Arts & Sciences’ Psychology department and a department from the School of Medicine).

**CERTIFICATION STATEMENT**
Statement required by certain sponsors to accompany invoices for certain funds. This statement certifies that expenditures reported and payments requested are in accordance with the terms of the agreement.

**CO-INVESTIGATOR (CO-PI)**
An Investigator who is participating in the sponsored research project but is not the PI. A Co-investigator is responsible for the direction of a portion of the research. He/she may be responsible for the administration and financial control, as well as for the scientific aspects, of a portion of the sponsored research project.

**COLLABORATOR**
An individual who participates as a researcher in the sponsored research project but is not reimbursed for his/her time and is not responsible for the direction of the research. A sponsored research project may nor may not have collaborators.
COMMITMENTS
Committed funds have been set aside but have not yet been spent for a specific planned or approved expenditure. Currently, commitments are tracked outside the general ledger system. In terms of the general ledger they are a pre-encumbrance. See ENCUMBRANCE.

COMPETING RENEWAL
A grant proposal for continued financial support of an Existing project that is evaluated for funding by the sponsor by a merit comparison to other similar applications.

CONSULTANT
An individual(s) who is paid to provide expert advice or services that are essential to the research conducted and is needed for a fixed period during the sponsored research project. A consultant is not responsible for the direction of the research, and, usually, is not an employee of the University. A sponsored research project may or may not have consultants.

CONTRACT
A legal agreement between the University and a sponsor, wherein the sponsor's purpose is to acquire property or services (the research) and provide funding to the University to that end. The sponsoring agency conceives the project and typically exercises close control and monitoring of the project. The University provides the required research product. If the sponsor is a federal agency, the project is governed by the Federal Acquisition Regulations. See also GRANT.

CURRENT BUDGET PERIOD
An active Budget Period. A Budget Period is active if today’s date falls between the Budget Period’s begin and end dates.

CURRENT EXPENSE
Expense for the period identified on a report or invoice. Specific to the B&R system, a current expense represents the expenses incurred for a specific invoice or report period, such as monthly or quarterly, for each financial category. These expenses appear in the “current expense” column.

CUMULATIVE EXPENSE
Total Expenses, broken down by financial category, for the fund from the start of the fund to the end of the period identified on the report or invoice. Cumulative expenses can also be referred to as “total expenses to date” since the inception of the award.

DELEGATED APPROVER
A person who will be given primary approver authority if the primary approver has not reviewed a proposal within a given time frame.

EB RATES
Employee Benefit rates that reflect the amount of cost associated with employee fringe benefits (for medical, life and LTD insurance, etc.), as a proportion of their salary.
ENCUMBRANCE
Encumbered funds have been set aside but have not yet been spent for a specific planned, approved expenditure. Currently, the general ledger system creates encumbrances automatically for invoices, purchase orders, and salary expenditures, and automatically relieves the encumbrances when the payments are made. Other anticipated expenditures can be recorded as encumbrances through manual entry to the general ledger system and then must be relieved manually as well. See COMMITMENT.

FEDERAL INVOICE
Specific invoice format required according to the terms of agreement for billable federal awards. Form 270: Request for Reimbursement (see definition of reimbursement form), and Form 1034: Public Voucher for Services (the actual invoice listing current and cumulative expenses).

FINANCIAL CATEGORY
The sponsor’s classification, or high-level grouping, under which a financial detail line falls. Rather than using one of the University’s report templates to present revenue and expense figures, invoices and financial reports sent to a sponsor present the figures grouped by categories prescribed by that sponsor. See also “Mapping Template.”

FINMIS
Financial Management Information System, the University of Pennsylvania's core financial system, which is comprised of three modules from Oracle’s suite of Government (Public Sector) Financial Applications: General Ledger, Accounts Payable, and Purchasing. This suite of applications is currently at release 10.7 in both character- and web-based (NCA – Network Computing Architecture) versions, with plans to upgrade to NCA version 11i. The applications reside on an AIX platform and utilize an Oracle RDBMS, version 7.3.4, with plans to upgrade to version 8.i.

FREEZE GRANTS
This is a University-specific process wherein all activity associated with grant(s) accounts in the University Financial system is suspended to allow adjustments to be made and, thus, more effective control of grant activity as well as orderly and timely closeout of grant accounts, when appropriate.

FUND (FUND NUMBER)
A fund number is the 6-digit number that uniquely identifies financial support for an award across all schools and centers. The Fund number is contained within one of the segments of the FinMIS 26-digit account number. ORS uses the fund number to identify and record financial activity for an award. The same fund number may appear in multiple FinMIS Account numbers whenever there is more than one FinMIS Account number associated with a fund. The Fund Number always starts with the number “5” for sponsored projects (awards). The term “fund” also refers to an “account” within the ORS B&R system.

FUND END DATE
Represents the date the fund number is disabled in the FinMIS General Ledger. This date
does not coincide with the date that the period of financial support is to end, but occurs after all adjustment and reporting activity has been completed.

**FUNDING CYCLE**
The total period during which a sponsor has made an award for a research project (usually 1 to 5 years). A funding cycle may be composed of one or more funding increments or budget periods.

**FUTURE YEAR SUPPORT**
Periods of research support planned by the sponsor to be subsequent to the current award or budget period. See AWARD.

**GRANTS OR COOPERATIVE AGREEMENTS**
An agreement of a sponsoring agency to provide financial assistance to the University to accomplish a public purpose. The activity is investigator initiated and that investigator retains scientific or academic freedom with no substantial involvement of the sponsor during the performance of the activity (research or training). See also CONTRACT.

**GRANT EXTENSIONS**
This represents an addition to the length of time for research on a grant. Grant extensions do not usually involve additional funding.

**GRANT YEAR**
The period of time that defines the time during which research will be funded and performed. It may vary – it can be greater than, less than or equal to twelve months. Although it often begins on the first of the month, it may begin on any day of the month.

**HTML DATASTREAM**
The use of Hyper-Text Markup Language to transmit a formatted datastream of information.

**INVESTIGATOR**
An individual who participates as a researcher in the sponsored research project, is reimbursed for his/her time, and is responsible for the direction of the research. A proposal must be submitted by a Principal Investigator, and other investigators (co-investigators) may be named on the proposal as well. All investigators must have an academic appointment at the University of Pennsylvania. If the Principal Investigator is a Research Associate, the proposal follows the usual route for review and approval, but the proposal must include a letter of responsibility signed by a member of the faculty.

**MAPPING TEMPLATE**
A model used to assign a Financial Category to each line item imported from FinMIS or Payroll. The assignment is based on (1) the sponsor (sponsor code) associated with the Fund segment within the FinMIS Account Number for the line item, and (2) the Object Code segment within the FinMIS Account Number for the line item.

**MASTER PROTOCOL**
A description of a technique or procedure used in research using human or animal subjects. The master protocol is associated with an investigator. A Master Protocol typically undergoes a full board review. (See also “Protocol Instance.”)

MAPPING TEMPLATE
A model used to assign a Financial (expense/revenue) Category to each line item imported from the University's financial systems. The assignment is based on the sponsor's budget categories that are associated with the award, along with the the Object Code segment within the FinMIS Account Number for the line item.

NON-COMPETING RENEWAL
A grant proposal/progress report for the planned continued financial support of an existing project during a new budget period, but typically within a funding cycle.

OBJECT CODE
4-digit code that is contained within the FinMIS 26-digit account number. The object code identifies a financial activity item, as a specific revenue, expense, asset or liability category.

PBIL AMOUNT
See BILLABLE AMOUNT

PRIMARY APPROVER
A person whose approval is necessary to allow the proposal to be routed to the next level in the approval hierarchy.

PROGRAM PROJECT
A set of sponsored research projects that make up a broadly based, often multi-disciplinary, research program with a well-defined central research focus. Interrelationships between the component research projects (“sub-projects”) are expected to result in a greater contribution to the program goals than if each project were pursued separately. (There are various kinds of program projects; SCORE grants and center grants are two examples.) A proposal for a program project names a principal investigator for the program project, and includes both a master budget for the program project and a proposal for each sub-project. More than one investigator is involved in a program project, and a given investigator may be responsible for more than one sub-project within a program project. The sponsor may award funding for all, some, or none of the sub-projects. See PI and PROJECT LEADER.

PROJECT LEADER
The investigator who is responsible for the scientific direction and conduct of a sub-project that is a component of a Program Project.

PROJECT PERIOD
The total period during which a sponsor has authorized spending for a research project, from the beginning of the first funding cycle to the end of the last funding cycle. A project period may include one or more funding cycles.
PROPOSAL AND APPLICATIONS
A request by the University of Pennsylvania for funding from a potential sponsor. The request usually includes a statement of work and a budget, as well as institutional (University) approval. Technically a proposal results in a contract, whereas an application results in a grant, but these terms are sometimes used interchangeably.

PROTOCOL INSTANCE
The implementation of the Master Protocol in the course of a research project associated with an investigator, sponsor and award. A Protocol Instance will normally be reviewed in an expedited manner.

REIMBURSEMENT FORM
A form that some sponsors, both federal and private, require before they will release payment for a fund. Required information on this form varies with the sponsor but includes, at minimum, the award amount and total expenses incurred to date. This form, when required, may be sent to the sponsor in lieu of an invoice.

RESPONSIBLE DEAN
Dean of the school that includes the Responsible Organization (the organization that is administratively responsible for the proposal). In cases where the Responsible Organization is a center that works across schools, the Responsible Dean is the dean of the school where the Principal Investigator has an academic appointment. (If the Principal Investigator has appointments in more than one of the schools associated with the center, the Responsible Dean would be determined based on which of those appointments pays the highest salary to the Principal Investigator.)

RESPONSIBLE ORGANIZATION
The organization administratively responsible for a proposal or award.

SCHEDULED PAYMENT FUND
Fund in which receipt of payment is based on a predetermined schedule outlined in the agreement or contract. Since sponsors send payments for these types of funds automatically, these funds do not require invoices or reimbursement forms.

SIGNATORY AUTHORITY
Person or persons recognized by the Trustees of the University of Pennsylvania and the sponsor as representing the University of Pennsylvania for purposes of proposal submission.

SPONSOR
Entity that provides (or will potentially provide) financial support for a project according to the terms of a grant or contract. A sponsor may provide more than one award, each of which would be tracked as a separate fund, or funds, in the system. The University itself is the sponsor of some projects performed by researchers in the University community.

SUBCONTRACT
Entity that provides (or will potentially provide) financial support for a project according to
the terms of a grant or contract. A sponsor may provide more than one award, each of which would be tracked as a separate fund, or funds, in the system. The University itself is the sponsor of some projects performed by researchers in the University community.

**SUPPORTING BA**
Any BA who supports a given project.

**UNALLOWABLES**
These represent expense items that cannot be charged to a given project; they are typically defined in the terms and conditions of the sponsor agreement and usually differ from sponsor to sponsor.

**UNLIQUIDATED OBLIGATIONS**
These represent open commitments for goods or services received but for which payment is pending.

**UNMAPPED CATEGORY**
An financial category in the B&R system that is used as a “catch-all” category for a line item or expense object code from the FinMIS import that is not recognized as an allowable expense for the particular mapping template in question. An ORS accountant further investigates expense items that fall into the unmapped category.

**UNOBLIGATED BALANCES**
These represent residual funds at the end of a funding cycle that may or may not be able to be spent by the institution, based on the specific terms of the contract or grant.

**UNSOLICITED FUNDS FOR RESEARCH**
In some cases, an entity presents the University with a sum of money to support research, though no proposal was made to the entity, and the entity may or may not be requesting a research solution. Depending on the terms and conditions associated with the sum presented, it may be either a grant or a gift. The University makes a determination as to which it is. If it determined that it will be handled as a grant, it is considered to be “unsolicited funds for research.”