Abstract

Higher education institutions that secure federal grants and agreements must implement internal controls to comply with each federal grant-making agency's unique demands, in accordance with their solicitations. Research administrators are integral in this process as they are tasked with the review of proposals, the upkeep of documentation, the fulfillment of administrative obligations, and proactive engagements with principal investigators and central offices to solve any pre-award complications. The aim of this project is to create a tool that helps to boosts the effectiveness and productivity of research administrators at Caltech throughout the proposal development process. The literature review sourced many institutional pre-award checklists, which captured agency-specific requirements. This information was integrated into the checklist to provide research administrators with a clear, structured checklist for conducting consistent pre-award review at Caltech.
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Budget Preparation: Putting together a budget for a project means carefully figuring out all the expenses. You need to make sure every cost is needed and makes sense for what you're trying to achieve. “The budget should be easy to understand and follow the rules of both the funding agency and the institution” (University of South Carolina, n.d.).

Compliance Assurance: Making sure that the proposal follows the funding agency's rules and the institution's own policies is a key part of getting ready to submit a proposal. “You need to check the proposal against the Solicitation carefully, to make sure it meets all the requirements and goes beyond them if it can” (NIH, Grant Applications and Proposal Considerations for Human Subjects, n.d.).

Internal Review and Approvals: Before submitting a proposal, it goes through a check-up at the institution. Different groups look it over to make sure the methods are solid, and it fits with what the institution stands for.

Negotiation: Negotiating a grant means talking over the terms and conditions with the sponsor, especially if there are any issues. This involves understanding what the sponsor wants and sometimes adjusting your project to fit their feedback. The goal is to find a balance between what the sponsor needs and what your project aims to do (CommGap, 2011).

Pre-Award: Activities that take place before the grant, cooperative agreement or contract is awarded.

Proposal Development: The proposal should clearly explain your plan to reach your goals. It must lay out the main steps you’ll take over time and include a clear budget that shows why you need the funds, all while making sure it fits the project’s needs and follows the sponsor’s rules (Grants.gov, Completing the Application, 2019).
Research and Identification: Clearly explain your goals, what you hope to achieve, how long it will take, and how much it will cost. You should thoroughly understand and describe the issue you want to solve or the question you want to research. Also, clearly present your methods and ideas for how to tackle it and explain how the results could make a difference (Grants.gov, Pre-Award Phase, n.d.).

Solicitation: A grant solicitation is an announcement that asks organizations to submit proposals for funding to help solve a problem or meet a need that the grant aims to address.

Submission and Communication: When you send your proposal to the funding agency and, make sure it's done carefully. It's also key to keep the lines of communication open. That way, if the agency has any questions or needs more information, you can provide quick and correct answers.
Abbreviations

**Caltech.** The California Institute of Technology, a world-renowned institute for science and engineering, is an accredited, private, non-profit educational institution (Caltech, About Caltech, 2024).

**EAS.** The Division of Engineering and Applied Sciences, one of six academic divisions at Caltech, is dedicated to expanding human knowledge and benefiting society through research integrated with education in engineering and science (EAS, About, n.d.).

**JPL.** The Jet Propulsion Laboratory is a federally funded research and development center managed by Caltech (JPL, Who We Are, n.d.).

**MIT.** The Massachusetts Institute of Technology, a world-renowned, accredited, private, non-profit educational institution, aims to improve the world through education, research, and innovation (MIT, About MIT, n.d.).

**NASA.** The National Aeronautics and Space Administration, an independent agency of the United States federal government, explores the unknown in air and space, innovates for the benefit of humanity, and inspires the world through discovery (NASA, About NASA, n.d.).

**NIH.** The National Institutes of Health is the primary agency responsible for public health research in the United States government (NIH, About NIH, n.d.).

**NSF.** The National Science Foundation, an independent government agency, promotes the advancement of science (NSF, About NSF, n.d.).

**OSR.** The Office of Sponsored Research at Caltech provides a full range of central administration, pre-award, and non-financial post-award services in support of faculty and their sponsored research programs (OSR, Welcome to the Office of Sponsored Research n.d.).

**PA** A Program Announcement is a formal notice about an ongoing or new extramural funding activity or program. (NIH, Types of Funding Opportunities, n.d.)

**RA.** Research Administrators support the development, compliance, management, and financial oversight of sponsored research (Calvo, Phillips, Burks, and Johnson, 2023, 04).

**RFP.** A Request for Proposal is a document that solicits proposals through a bidding process for potential goods and services (Caltech Procurement Services, Policies and Procedures, n.d.).

**R&R Budget.** The Research and Related Budget is a form used in the majority of applications for extramural funding activities or programs (NIH, General Application Guide, n.d.).
SBIR/STTR. The Small Business Innovation Research and Small Business Technology Transfer programs encourage domestic small businesses to engage in federal research and development with potential for commercialization (SBA, About SBIR and STTR Programs, n.d.).

SF424. The Standard Form 424 comprises standard data set forms used by the federal government in grant application packages (grants.gov, Grant Forms n.d.).

UC. The University of California is a public university system in the state of California (University of California, About Us, n.d.).

WRBC. The Wadhwani Research Centre for Bioengineering supports technology translation in diagnostics, therapeutics, MedTech, and synthetic biology (WRBC, About WRBC, n.d.).
Chapter 1. Introduction

1.1 Background.

The pre-award phase in grant management is a critical and comprehensive process that involves several key steps before the actual awarding of funds. This phase begins with identifying potential funding sources and understanding their requirements. It involves the detailed preparation of grant proposals, which includes outlining project objectives, methodologies, timelines, and budgets (Wrenn, What’s the Difference Between Pre-Award and Post-Award Research Administration? 2016). Pre-award also requires thorough compliance checks to ensure alignment with both institutional and funding agency regulations. This stage often includes negotiations over terms and conditions of the grant, addressing any concerns the funding agency might have. Effective pre-award management sets the stage for successful project implementation if an award is awarded. This phase is vital for establishing a clear, structured, and compliant framework for the upcoming research or project activities (Wrenn, What’s the Difference Between Pre-Award and Post-Award Research Administration, 2016).

Ensuring that all necessary administrative documents are included as part of a response to a solicitation is crucial in this step so that a proposal will not be returned.

The characteristics of the pre-award phase in grant management encompass:

- Research and Identification: The process of crafting a detailed grant proposal is a meticulous and strategic task that involves not only stating objectives, expected outcomes, timelines, and budget plans but also making a compelling narrative. It includes a deep analysis of the problem or research question, a robust and innovative section that outlines the approach and techniques to be used, and the anticipated outcomes and their potential impact (Grants.gov, Pre-Award Phase, 2024).
- Proposal Development: Crafting a detailed grant proposal is complex. It involves an in-depth analysis of the project's relevance. The proposal must comprehensively detail the strategies for achieving objectives. The proposal must also include a well-structured timeline that outlines key milestones and a detailed, budget and Justification that aligns with the project's scope of work and ensuring that the proposal addresses all the Sponsor's guidelines (Grants.gov, Completing the Application, 2019).

- Compliance Assurance: Ensuring the proposal and project plan not only align with but, also meet the funding agency's guidelines and the institution's policies is a critical aspect of pre-award management. This process involves a cross-referencing of the proposal with the details of the funding guidelines, ensuring every requirement is met and exceeded where possible. Simultaneously, it demands a thorough understanding and integration of the institution’s own policies and ethical standards, creating a proposal that is not just compliant but also reflective of the institution's values and priorities (NIH, Grant Application and Proposal Considerations, 2024).

- Budget Preparation: Developing a comprehensive and realistic budget that aligns with the project's goals and scope is an important task. It involves a detailed review of all potential costs, ensuring each is necessary and justifiable in the context of the project's objectives. This process requires including possible future expenses accurately’ as well as, considering both direct and indirect costs. Moreover, the budget must be prepared in a format that is clear, transparent, and in line with both the Sponsor's requirements and the institution's financial policies, demonstrating a responsible and efficient allocation of resources (Miner, T., Diaz, I., Paffarath, D., Developing Compelling Budget Justifications, 2021).
• **Internal Review and Approvals:** This phase involves an examination by relevant institutional committees or boards, who review the proposal's methodological soundness, ethical considerations, and alignment with the institution's mission and values. This comprehensive review ensures the proposal's robustness, enhancing its credibility and reinforcing its commitment to excellence and institutional goals (NIH, Grant Application, and proposal Considerations for Human Subjects, 2019).

• **Submission and Communication:** Submitting the proposal to the funding agency is the first step and requires attention to detail. Maintaining clear, responsive communication for any clarifications or additional information is important. This ensures that any questions or concerns from the funding agency are addressed promptly and accurately.

• **Negotiation:** Discussing terms and conditions of a potential award with the Sponsor involves a negotiation process, if there are any concerns. It is communication that includes understanding and, in some cases, even changing the scope of a project in response to the sponsor’s feedback. This requires balancing between accommodating the funding agency's requirements and maintaining the project's core objectives. A beneficial agreement is important for both parties (CommGap, 2011).

### 1.1.2 Overview of the Award lifecycle.

![Diagram showing the lifecycle of an award](image-url)
A thorough understanding of the award cycle is important. The award lifecycle typically begins with the pre-award phase, where research administrators must navigate the entire spectrum of the grant lifecycle. The award cycle knowledge is particularly important when beginning an award as an issue in the Pre-award phase may lead to proposals being returned without review.

1.1.3 Brief background of Caltech.

The California Institute of Technology (Caltech) is a world-renowned science and engineering institute that also manages the Jet Propulsion Laboratory (JPL) for the National Aeronautics and Space Administration (NASA) (Caltech, About Caltech, 2023). Caltech is recognized for its rigorous academic programs, distinguished faculty, and its commitment to pushing the boundaries of research and innovation.

1.2 Statement of the Problem.

While the California Institute of Technology is renowned for its leadership in science and engineering, it confronts the challenge of preparing new Grant Managers for the complexities of pre-award sponsored research management. These Grant Managers receive training from Senior Grant Managers or the Sponsored Research Manager and frequently consult the Office of Sponsored Research (OSR) for guidance during proposal development and submission. However, this approach has its drawbacks. Often, the process of compiling all necessary documentation for proposal submission takes longer than expected, leading to last-minute submissions. This delays the review process, burdening both the OSR and the Academic Division. Additionally, Grant Managers depend on their seniors to ensure their proposals are complete, which can be problematic if the proposal is finished on the day of submission, leaving
inadequate time for the OSR to review. This lack of thorough preparation could result in proposals being returned without review, indicating potential issues in internal controls that might necessitate corrective action.

1.3 Project Question.

To enhance the effectiveness of Grant Managers, comprehensive training programs and resource development are essential. A key resource to be developed is a Pre-Award checklist, designed to guide Grant Managers through the proposal review process. This checklist covers relevant sponsor and institutional documentation requirements. It provides a detailed guidance on the necessary components for a successful proposal submission, ensuring thorough preparation and compliance. This tool aims to streamline the proposal process, reduce errors, and improve the overall quality of submissions.

1.4 Project Objectives.

The objective of this project is to create a Pre-Award checklist for Grant Managers in the Division of Engineering and Applied Sciences at Caltech. This resource aims to assist both new and existing Grant Managers in effectively and efficiently navigating the Pre-award Phase. The checklist will be a comprehensive compilation of common Pre-Award documents, presented in a condensed format. It is designed to act as a step-by-step guide for practical application in Pre-award processes at Caltech. Utilizing this checklist is expected to reduce the number of issues encountered during the Pre-award phase and decrease the likelihood of proposal file updates or returns without review later in the process.

1.5 Significance.
A Pre-award review checklist can assist research administrators in effectively and efficiently managing the proposal and submission process. It offers guidance on common items and certifications required in the proposal phase of the award, supporting good stewardship, and helping to prevent proposal rejections or the need for additional file updates due to missing items. Information on Pre-award preparation and submission is often dispersed across various guides, files, or personal notes of Research Administrators (RA). While these sources provide crucial details, a comprehensive resource encompassing common Pre-award forms in a single checklist that guides RA’s through the Pre-award process is lacking. During the Pre-award phase, memorizing all necessary documents for submission can be challenging especially when there is a tight turn around or last-minute submissions. The Pre-award checklist serves as a valuable resource for maintaining proper stewardship. The checklist can be made available as a shared, editable file on a cloud drive by EAS, offering a central location for quick reference.

1.6. Exclusions and Limitations.

The Pre-award checklist is intended as an additional tool, not as a replacement for any primary documents that a sponsor's solicitation might discuss, whether required or not. It should not substitute for any institutional policies or procedures either. Research administrators should thoroughly review the Solicitation to understand the primary documents needed, but they can use the checklist as a supplementary resource during the Pre-award Process. The checklist will highlight common items typically required in a proposal submission but won't cover every detail, especially concerning agency-specific requirements or specifics in Sponsor Announcements, Broad Agency Announcements, or Foundation requirements. This checklist is tailored specifically for Caltech's Division of Engineering and Applied Sciences.
Chapter 2. Literature Review

2.1 Overview of Literature Review.

A literature review was conducted by, examining publications from the National Council of University Research Administrators (NCURA). This review presented several articles on Pre-award processes and best practices. While specific literature on creating institutional pre-proposal checklists was not found, an exploration of various higher education institutions' websites revealed that some have developed their own pre-award manuals. It was also noted that existing checklists tend to be program-specific, such as those for NASA or SBIR/STTR, lacking the broader guidance needed for managing the proposal and submission phase across academic divisions and in coordination with the Office of Sponsored Research at Caltech. Additionally, publications on proposal writing were analyzed to gain insights into how theoretical concepts are translated into practical proposal elements.

2.2 Details of Review.

The literature review highlights the critical role of internal controls in the Pre-award phase, emphasizing the need for consistent practices and the retention of extra documentation when necessary. Furthermore, it discusses how government agencies, for example NSF, regularly make editorial changes to clarify or enhance their documents. These updates aim to align the terminology and guidelines across various policy documents, reducing inconsistencies and making it easier for users to understand and adhere to NSF policies (NSF, Summary of Changes to the PAPPG, 2024). This is done to ensure that all guidance is consistent within NSF and in alignment with federal regulations. Higher education institutions must ensure they adhere to updated federal agency guidelines, especially when responding to solicitations in the Pre-award phase. The goal of Research Administrators during the Pre-award phase is to ensure the
greatest percentage of proposals make it through the and track issues before they are submitted in response to a solicitation. An agency may decide to return without review any proposal for failure to comply with any portion of the solicitation instructions or the guidance. Additionally, it could result in ongoing updates through a resolution process such as a proposal file update which, “allows the organization to request the replacement of files or revision of other Proposal Attributes, associated with a previously submitted proposal” (NSF, Proposal Preparation and Award Administration, 2010). More often, federal agencies will reach out requesting a Proposal File Update to remove or revise documents that are out of compliance (NSF, Proposal & award Policies and Procedures Guide, 2024). In cases where a proposal is returned without review, there may not be an appeals process. The decision to return a proposal without review is considered final. The difference in requirement from agencies may cause a proposal to be non-compliant. This highlights the importance of implementing internal controls for the accurate and consistent submission of proposals, ensuring the proper collection of documentation for the review process. Such measures are crucial for addressing sections that may be out of compliance, ultimately reducing the number of proposals returned without review.

The literature review yielded articles highlighting the importance in pre-award that research administrators play. For instance, the Wadhwani Research Centre for Bioengineering (WRBC) realized that “while exploring ideas to support faculty, it was realized that support at the pre-award stage was not available at the institutional level” (Renade, and Patel, Translating Technologies Together, 2024, 40). This indicates the necessity for Research Administrators to identify the requirements during the proposal and submission phases, ensuring a streamlined and compliant process for grant applications. The pre-award phase, “represents the beginning of the grant lifecycle, which includes announcing opportunities, submitting applications, and reviewing
applications” (Grants.gov, Grants 101, n.d.). Another role of Research Administrators during the Pre-Award phase is to collaborate with the Principal Investigator and, if necessary, their Central Office, to determine and gather the documentation and Certifications required for responding to a Solicitation.

The preparation and review of proposals in the pre-award phase are time-intensive, and meticulous review of every submission detail is often not possible, especially when faced with tight deadlines. This is especially challenging for research administrators who are managing a high volume of proposals during the proposal development stage. The literature review suggested that some higher education institutions have implemented a strategy for the pre-award phase, where proposals under specific announcements are reviewed more thoroughly before the submission has been finalized. The benefit of this approach is that personnel focusing on specific grant opportunities, can efficiently navigate through the solicitation process and gather the required materials. However, it is important to identify an effective and efficient method for completing the review process during the proposal preparation phase. An effective method, “that facilitates a proposal’s creation and submission, prior to the award being received” (University of Michigan, Pre-Award, 2024) would be to identify a process that prepares and “creates internal deadlines for proposal components, determines timelines for internal coordination with other departments, collaborates with other institutions, and collects subawardee documents” (Brown University, Pre-Award Services, 2024). This indicates the importance of providing research administrators with resources, enabling them to navigate the pre-award phase efficiently and effectively.

Brown University provides a pre-award checklist exclusively for NASA grants, intended for use by research administrators before submissions (Brown University, Office of Sponsored
Projects, 2024). While not a comprehensive tool, it offers guidelines to aid in reviewing essential areas. It features a description of key points, complementing the initial process established for proposal preparation. The pre-award checklist is structured as a list of questions, allowing the departmental research administrator to indicate whether each pre-award issue has been reviewed. The form includes a section to note if the necessary comments or corrections have been addressed and features a follow-up field for contact via email or phone.

The Massachusetts Institute of Technology has also structured a pre-award checklist specifically for NIH R01/NIH R21 proposals, designed to guide research administrators through the preparation and submission process. This checklist encompasses aspects such as reading the PA/RFA solicitation carefully, understanding submission guidelines, and ensuring all components of the application—from the SF424 R&R cover page to budget details—meet NIH requirements (MIT, R01/R21 Proposal Research Administration, 2024). It also emphasizes the importance of compliance with human subjects and animal research regulations, as well as the project narratives and supporting documents to align with NIH's expectations for submission. The checklist features notes that clarify certain requirements. It is available in a downloadable PDF format and seems to be updated periodically, with a note describing each change.

The pre-award guidance provided by different institutes highlights various areas of concern observed across multiple institutions of higher education. These checklists show specific issues that may be encountered during the proposal submission process. UC Berkeley, for instance, has highlighted on their website certain guidance, noting Pre-award Tasks (UC Berkeley, Pre-Award Process and Submission Timeline, n.d.). The information within these documents can serve as a foundation for establishing best practices in proposal development and submission.
2.3. Applicability of Literature Review.

The applicability of the literature review to the Pre-award project is based on findings from various sources, which offered insights into Pre-award processes. While specific literature on creating institutional pre-proposal checklists was scarce, the review found that some higher education institutions have developed pre-award manuals tailored to their needs. These findings highlight the importance of internal controls. They also show how government agencies update documents to maintain consistency and clarity, with implications for Research Administrators who must stay informed on updated guidelines during the proposal and submission phases. The review indicates a gap in institutional support at the pre-award stage and the need for tools to aid Research Administrators in managing the proposal process, especially under tight deadlines. Some institutions have adopted specific review strategies, which underlines the need for resources that enable Research Administrators to navigate the pre-award phase efficiently.
Chapter 3 Need (s) Assessment

3.1 Needs Assessment.

Establishing a framework is vital for higher education institutions to ensure they meet sponsor requirements during the pre-award phase of proposal development and submission. A structured approach is key to streamlining the process. This ensures not only compliance with the solicitation but also improves the efficiency of the process. It's critical to have a thorough understanding of the sponsors’ requirements and guidelines, as this knowledge supports effective communication and negotiation with sponsors, reflecting a well-informed approach to grant management (NIH, Pre-Award and Award Process, 2024). Research administrators are critical during the proposal development and submission phases, ensuring all actions comply with established policies and procedures. They must carry out a detailed review, ensuring the proposal strictly adheres to sponsor guidelines and institutional protocols. In addition, research administrators need to understand best practices in the pre-award phase, especially understanding when to retain additional supporting documentation and certifications. A checklist should highlight common issues related to proposal development and submission, providing a valuable tool to aid research administrators in their work; as well as improve oversight and consistency during the pre-award process.

3.1.1. Assessment of Need.

Building framework during the pre-award phase for Caltech is important. As this will ensure adherence to sponsorship guidelines and facilitates a smooth proposal development and submission process for Research Administrators. It is noted that, “Departmental administrators in particular become the custodians of interpreting newer announcements, their requirements, and obtaining the various institutional approvals. A challenge with these opportunities includes
collecting all required documentation within designated timelines, which can be inflexible depending on the collaborating institution’s processes” (Ali and Quintero, The Chronicles of Subcontracting, 2023, 20). For this reason, it is particularly critical to have a pre-award checklist that covers essential aspects of proposal development and submission to assist Research Administrators with their work. Given research administrators limited time, which is also dedicated to various other duties, it becomes especially important to have framework that can assist them. Therefore, equipping research administrators with a checklist that outlines essential proposal components, may facilitate their efforts in navigating the submission and review during the pre-award phase effectively.

In order to have an effective pre-award team and effectively support them, it is essential to continuously develop new tools that enhance the efficiency and quality of their work. Numerous higher education institutions will persistently refresh their pre-award websites, incorporating the most current revisions of policies and procedures to stay up to date with federal regulations and best practices in research administration. A pre-award review checklist for sponsored projects, can be shared and periodically updated on a cloud drive, and would serve as a valuable additional resource.

Investigators depend on the expertise of their RAs to ensure a seamless process in managing documentation, as highlighted by the statement, “Investigators depend on their administrators to collect all award documentation and ensure it is completed and approved by the subrecipient’s sponsored office” (Ali and Quintero, The Chronicles of Subcontracting, 2023, 21). Inadvertently, omitting documentation during the pre-award phase could lead to a proposal being rejected, returned without review, or necessitate a proposal file update. Caltech’s Office of Sponsored Research monitors sponsored research activities. There are presentations and training
for RA's available at researchadministration.caltech.edu/osr, accessible exclusively to those within Caltech.

3.2 Metrics.

The performance metrics for proposal success rates at Caltech according to the latest research administration forum, shows a pattern of fluctuation over a 15-year span. For all proposals under Figure 1, Caltech saw peaks and dips, with the success rate beginning at 43% and reaching 49% in both 2005 and 2019 (Mayo, D., 2021, 5).

![Success Rate - All Proposals](image)

Figure 1. Proposal Success Rates: An Overview, 2004-2019 (Mayo, D., 2021, 5)

Performance metrics also revealed that NSF proposals at Caltech often exceeded the national average. However, fluctuations were observed, such as in 2011, when Caltech's average dipped
as indicated in figure 2 to 29% against the national 24% (Mayo, D., 2021, 5). The trend concluded with Caltech at a 42% success rate in 2019, surpassing the national average of 27% (Mayo, D., 2021, 5). This overall trend shows the competitive and changing landscape of research funding.

Figure 2. NSF Proposal Success Rates at Caltech: 2004-2019 (Mayo, D., 2021, 5)

Additionally, performance metrics also revealed that NIH proposals at Caltech have generally exceeded national averages, despite some notable fluctuations. In 2006, as presented in figure 3 there was a decline from Caltech's 35% success rate in 2005 to 26%, while the national average was 19% (Mayo, D., 2021, 5). A similar pattern occurred from 2008's 31% to 2009's 26% at Caltech, against the national rate of 21% (Mayo, D., 2021, 5). Peak performances were recorded
in 2016, with Caltech at 38% success, significantly higher than the national 21%, and in 2018, with a 37% success rate compared to the national 23% (Mayo, D., 2021, 5). The period concluded with Caltech dropping to a 33% success rate, while the national average remained steady at 23% (Mayo, D., 2021, 5). This pattern shows the evolving trends of research funding and highlight the need for Caltech to develop strategies to maintain its competitive edge in proposal success.

![NIH Success Rates](image)

Figure 3. NIH Proposal Success Rates at Caltech: 2004-2019 (Mayo, D., 2021, 5)

The literature review demonstrates the vital role of research administrators in the pre-award process. Fluctuating proposal success rates at Caltech signal the need for a pre-award checklist to guide administrators through the review and submission stages. The implementation of such a checklist stands to benefit Caltech by helping to minimize the instances of proposals being returned for review or requiring file updates. Ultimately, this tool will aid in improving proposal success rates, ensuring Caltech's competitive standing alongside national averages.
3.3 Sources.

The author identified the advantages of a pre-award checklist for research administrators, based on interactions and experiences with various professionals involved in research administration, particularly those with pre-award responsibilities. This checklist is designed to streamline the proposal review and submission process in the pre-award phase, enhancing efficiency and ensuring compliance with requirements before the award stage. Drawing from current work experience alongside both entry-level and seasoned research administrators, the author has identified a clear need for guidance. This insight emerged from direct feedback, highlighting the importance of tailoring support to accommodate the diverse expertise within the field of research administration. Currently, there isn't a specific pre-award manual available as a resource, leaving the research administration forum as the primary source of information. However, for those new to the field, navigating this forum can be challenging, particularly when trying to understand and practically apply updates to policies and procedures. This situation indicates the need for a more accessible resources to guide RA’s through the pre-award processes.

3.4 Committees.

Efforts to form working groups for the purpose of evaluating requirements were not initiated.
Chapter 4. Project Description

4.1 Discussion of project elements.

The project aims to create a pre-award review checklist that will serve as a guide for departmental research administrators at Caltech throughout the pre-award phase of proposal review and submissions. This tool aims to streamline the review and submission process, thereby reducing instances of proposals being returned without review or requiring proposal file updates. It will function as a step-by-step guide, navigating departmental research administrators through the necessary documents required for the review process. Each section outlines the standard documents typically needed in the pre-award phase, followed by a detailed list of specific documents to be gathered. The checklist is presented in a Word document format, enabling research administrators to include additional components as needed and to easily mark the status of each item.

The checklist addresses the standard forms typically required during the pre-award process, ensuring a thorough preparation for grant submissions. The checklist includes topics such as, key personnel information, detailed budget preparation using standard forms, statements of work, biographical sketches, facilities and resources, applicable forms, and certifications. It also includes the finalization of the proposal package for review by the Office of Sponsored Research (OSR), incorporating feedback, submission of internal forms, and obtaining confirmation of submission from OSR. This checklist allows Caltech's departmental research administrators to maintain uniformity in their review and submission processes during the pre-award phase, significantly lowering the chance of unintentional omissions.
Chapter 5. Methodology

5.1 Methodology Overview.

To ensure thorough due diligence and responsible management of proposals during the pre-award phase, it is important to equip research administrators with essential, user-friendly resources. These tools are designed to comprehensively address submission requirements and enhance the efficiency of the review and submission process. By doing so, research administrators can optimize their effectiveness, maintain diligence, and expedite the entire pre-award procedure. The project has revealed that a pre-award review checklist would be a beneficial tool to assist research administrators in their roles. The development of the checklist content involved research into publications, resources identified during the literature review, and the author's experience in research administration. The resources and publications used to compile the checklist include Government Agency policies, institutional policies on pre-award administration at Caltech, and proposal submission reports.

5.2. Project Design and Discussion.

Essential pre-award topics and challenges were identified through the Caltech Research Administrators Forum and program-specific checklists, as well as guidance from institutional pre-award policies. This input structured the checklist into two main sections: one outlining necessary pre-award documents and the other concentrating on internal submission guidelines. This format guarantees a thorough approach to the proposal process. The section on required pre-award documents compiles a detailed list of essential items, derived from a blend of proposal development publications, digital resources, and research administration publication, ensuring the list contains the typical sections of a proposal.
5.2.1 Common Pre-award Issues.

The author’s analysis of pre-award checklists from notable higher education institutions revealed that the University of Michigan, Indiana University, and MIT provided the most thorough frameworks for key pre-award processes. These institutions’ checklists were specifically tailored to meet the distinct demands of various funding agencies. By integrating these comprehensive topics into the pre-award checklist, it assures a wide-ranging consideration of the necessary proposal components. This is key, in ensuring that proposals undergo detailed reviews at each stage of development and submission, thereby streamlining the resolution of issues and enhancing the quality of final submissions.

The components incorporated into the pre-award checklist are designed to align with the common requirements mandated by funding agencies for proposal submissions. This ensures that each proposal is comprehensively prepared to meet agency-specific standards. It includes reminders about internal policy on submission timelines, ensuring that proposals are thoroughly reviewed and finalized well before the submission deadline to avoid last-minute complications. Additionally, the checklist also emphasized the importance of adhering to submission deadlines, highlighting the necessity for proposals from professorial ranks to be reviewed by the Division Finance Manager at least 5 business days before the sponsor's deadline. For non-professorial ranks, the review period extends to at least 8 business days, ensuring sufficient time for a thorough examination of the proposals.

In the pre-award phase, it is crucial for research administrators to carefully adhere to the specific requirements set forth by federal grant-making agencies. This adherence ensures that all proposals are fully compliant with the established federal guidelines and expectations before submission. Unless specifically stated otherwise in a program solicitation, all proposals must
adhere to the prescribed preparation instructions, proposals that fail to align with these guidelines may be rejected or returned without review by the agency (NSF, Proposal & Award Policies & Procedures Guide, 2024). Therefore, it is important for research administrators to review the proposal documents and take the necessary actions during the review process.

5.2.2. Factors Beyond Research Administrators’ Control.

It’s crucial to recognize that critical risk factors in grant proposals also stem from missing submission deadlines, not following the specified content guidelines, and presenting an overly conventional research approach without innovation. Moreover, a proposal’s risk increases if the study area is not a priority for the agency or if the budget proposed is unrealistic (Locke, Spirduso, Silverman, Proposals that Work, 2000, 10). While research administrators may not have control over all these aspects, ensuring the clarity and completeness of proposals, are within their scope and can be the key to success in some cases.

5.3. Discussion of Questionnaire.

For this project, a questionnaire was not utilized.
Chapter 6. Project Results and Discussion

6.1. Project Result 1

This project led to the formation of a Pre-Award Review Checklist, specifically made to assist research administrators in navigating the pre-award phase. The checklist covers standard pre-award documents frequently required in proposal submissions. Additionally, the checklist is crafted to function as a practical reference tool, complementing core materials such as sponsor solicitations and internal institutional policy. The checklist has been created as a Word document, enabling research administrators to access and edit it via a shared drive. This allows for the occasional updates regarding pre-award review and the submission processes.

The checklist is designed to enhance the pre-award process, focusing on improving consistency and efficiency throughout the stages of review and submission on proposals. It is intended to guide research administrators towards the consistent adoption of high-quality proposal development. It is possible to reduce the probability that a proposal is overlooked during the review and submission process, by following the checklist.

The use of the checklist should help research administrators promptly address any potential issues within the proposal, ensuring all aspects are reviewed and resolved before the final submission to the funding agency. This will help possibly preventing proposals from being returned without review or requiring subsequent proposal file updates required by the sponsor thereby streamlining the submission process and enhancing the likelihood of successful proposal submission to the sponsor agency.
Chapter 7 Recommendations and Discussion

7.1 Introduction

The goal to create a tool to enhance the effectiveness and efficiency of departmental research administrators handling pre-award activities led to the creation of a pre-award review checklist. Departmental research administrators are advised to apply this checklist in the routine review and submission of their proposals. It is essential to arrange for the checklist to be kept in a shared space, ensuring it is accessible to all departmental research administrators. Finally, a strategy should be devised to ensure an as needed, or annual assessment of the checklist, facilitating the integration of additional information, revisions, and updates.

7.2 Recommendations.

7.2.1. Recommendation 1: The checklist should be used by departmental research administrators whose responsibilities include the review and submission of proposals.

Research administrators often navigate through a multitude of documents to compile and effectively manage outgoing proposals in response to agency announcements. These critical documents range from agency requirements and institutional policies to necessary certifications. Additionally, information is disseminated through various methods such as emails, meetings, and websites, making the consolidation of relevant data a complex but essential task for successful proposal submission. Incorporating a pre-award review checklist into the review and submission process could significantly streamline these tasks, offering a structured approach and ensuring critical elements are addressed effectively. Research administrators play a crucial role in the pre-award process, and the implementation of tools like a pre-award
review checklist is key to guiding their efforts effectively. This ensures a comprehensive and streamlined review and submission process. Such an approach not only facilitates their tasks but also greatly enhances the likelihood of proposal success.

7.2.2. Recommendation 2: The checklist should be circulated among research administrators and regularly updated to reflect the latest information.

Updating guidance documents like the pre-award review checklist is crucial for keeping pace with the constantly evolving research administration landscape. This ensures research administrators have the most current information, enhancing the effectiveness of proposal management. Additionally, each new proposal unveils distinct challenges and opportunities for alignment with specific announcements, underlining the varied and complex issues encountered in research administration. Caltech’s quarterly research administration forum serves as a crucial update. Furthermore, updates are distributed through sponsor notices, institutional announcements, and discussions at both departmental and unit levels, ensuring comprehensive access to recent developments. To maintain the checklist’s relevance, a minimum requirement should be the establishment of an annual review process for its update. However, updating the checklist on a quarterly basis would be even more advantageous, allowing for more frequent integration of new information and changes. It would be beneficial to assign a designated individual to manage these updates and would further streamline the process, ensuring that the checklist remains a relevant and effective tool. Also, the checklist should be uploaded as a shared file on a cloud drive, facilitating easy access for all research administrators, thus promoting collaboration and consistency in proposal preparation and submission.
Chapter 8. Conclusion

Caltech must uphold robust internal mechanisms to efficiently generate competitive proposals. This ensures their ability to meet and exceed the stringent requirements of funding agencies, thereby enhancing their success in securing grants. This responsibility extends to research administrators tasked with pre-award duties, emphasizing their role as diligent stewards. They are responsible for ensuring that all necessary documents, certifications, and internal forms are included in the proposal, guaranteeing a comprehensive and well-prepared package that meets funding agency requirements. Research administrators often face significant workloads and tight deadlines, underscoring the urgency of streamlining their processes. The objective of this project has been to develop a tool aimed at assisting research administrators in managing proposals with greater consistency, and effectiveness. A tool designed to streamline the pre-award review process and aids RAs in meeting the standard requirements of proposals efficiently. This resource is pivotal in ensuring that proposals meet the necessary criteria, streamlining the path to funding success. Submitting an incomplete proposal can significantly diminish the chances of obtaining federal government funding.

While resources such as sponsor solicitations, institutional policies, and pre-award checklists exist, there appears to be a lack of a concise, checklist-format resource that spans just a few pages and can be easily utilized by a research administrator during the pre-award review and submission process. The development of a pre-award review checklist at Caltech is crucial for guiding research administrators, given the challenge of remembering all necessary documents for a proposal. This tool simplifies the process by providing a clear outline of required materials, enhancing proposal quality. The checklist is designed to include essential elements such as providing detailed information to the Office of Sponsored Research, covering program
announcements, budget and budget justification, biographical sketches of involved personnel, mentoring plans, Departmental Authorization Forms, and necessary certifications, enabling research administrators to efficiently prepare and submit well-documented proposals. Enhancing protection against proposals being returned without review or requiring updates to the proposal file.
Bibliograph


Appendix 1: Pre-Award Review Checklist for Sponsored Projects

Pre-Award Review Checklist

The purpose of this checklist is to provide research administrators with a structured guide for the periodic review and submission of proposals. It outlines the key pre-award elements commonly required in agency announcements, aiming to streamline the proposal process. Although this checklist highlights crucial items, it is intended to complement the sponsor’s solicitation and internal institutional policies, ensuring that proposals are comprehensive and adhere to all necessary guidelines for a thorough review before submission.

### Basic Proposal Information

<table>
<thead>
<tr>
<th>PI name (Caltech):</th>
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<tbody>
<tr>
<td>Sponsor:</td>
<td></td>
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<tr>
<td>Prime Sponsor:</td>
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<tr>
<td>Solicitation:</td>
<td></td>
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<tr>
<td>Due date: Sponsor:</td>
<td></td>
</tr>
<tr>
<td>Title (if known):</td>
<td></td>
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<tr>
<td>Period of Performance:</td>
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<tr>
<td>Amount:</td>
<td></td>
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<tr>
<td>Transmittal letter to (E-mail from Lead with the required documents/information):</td>
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### Internal Submission Policy

<table>
<thead>
<tr>
<th>Professorial Rank: Submit to Division Finance Manager ≥5 business days before sponsor's deadline.</th>
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<tbody>
<tr>
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<tr>
<th>Non-Professorial Rank: Submit ≥8 business days before sponsor's deadline.</th>
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<tr>
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<th>Letter of Support: Request ≥10 business days before sponsor's deadline.</th>
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<tr>
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<tr>
<th>Technical Section: Finalize technical sections ≥2 days before agency's deadline.</th>
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<tr>
<td>Status note:</td>
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<tr>
<td>Proposal</td>
<td>Status</td>
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<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>1) Complete a detailed budget using the PHS 398 or SF424 forms (or any other applicable sponsor format).</td>
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<tr>
<td>2) Research Plan</td>
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<td>3) Complete the Budget and Budget Justification (add vendor quotes and/or rate agreements if required).</td>
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<tr>
<td>4) Obtain the Biographical Sketches for Key Personnel.</td>
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<tr>
<td>5) Obtain Current and Pending Support for Key Personnel (if required).</td>
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<tr>
<td>7) Obtain Equipment Information (if required)</td>
<td></td>
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<tr>
<td>8) Obtain the Mentoring Plan (if required).</td>
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<tr>
<td>9) Obtain any other documents/information as required in the PA/RFA</td>
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<tr>
<td>10) Obtain the References</td>
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<td>11) Obtain the Appendices</td>
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<tr>
<th>Subaward(s) (if applicable)</th>
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<tbody>
<tr>
<td>1) Letter of commitment</td>
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<tr>
<td>2) Scope of work</td>
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<tr>
<td>3) Biographical Sketch for key Personnel</td>
<td></td>
</tr>
<tr>
<td>4) Budget and budget Justification with collaborating institution’s F&amp;A rate agreement</td>
<td></td>
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<tr>
<td>5) Facilities Equipment and other Resources (if required)</td>
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<tr>
<td>6) Any other documents/information as required in the PA/RFA</td>
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<tr>
<th>Office of Sponsored Research</th>
<th>Status</th>
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<tr>
<td>1) Obtain, review, and provide the Office of Sponsored Research with the Solicitation/Program Announcement.</td>
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</table>
2) Obtain Certifications from OSR (Only when applicable. [i.e. SF-LLL, Representation for 889 implementation, Appropriations Provisions on Tax Delinquency and Felony Convictions, Subrecipient Commitment Form, etc.]).

3) Provide a finalized package to OSR for review.

4) Work with OSR on Feedback.

5) Provide Division Authorization Form (DAF) to OSR and PI approval to submit.

6) Obtain Email confirmation from the Office of Sponsored Research (OSR) indicating that the Submission has been successfully submitted.

References


Appendix 2: Short Bio

David Leopoldo Gonzalez is a research administrator based in Los Angeles, California. He holds a master’s degree from the Johns Hopkins University, a Bachelor of Arts in Sociology, with a minor in Communications from the California State University, Bakersfield; as well as a postgraduate certificate in Contract Management from the University of California, Los Angeles. Currently, David serves as a Central Office Research Administrator in the Office of Sponsored Research. His career has included a series of progressive roles within the Office of Sponsored Research at the California Institute of Technology (Caltech) in Pasadena, California.