

December 2012

# Workflow Management at the National Science Foundation

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Advisor Code: MR1  
Project Number: 1206  
Division: 46

# Workflow Management at the National Science Foundation



# WPI

An Interactive Qualifying Project submitted to the faculty of  
WORCESTER POLYTECHNIC INSTITUTE  
in partial fulfillment of the requirements for the Degree of Bachelor of Science

Sponsoring Agency: National Science Foundation, Washington, D.C.

Submitted to  
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Date: December 13, 2012

This report is submitted in partial fulfillment of the degree requirements of Worcester Polytechnic Institute. The views and opinions expressed herein are those of the authors and do not necessarily reflect the positions or opinions of the National Science Foundation or Worcester Polytechnic Institute.

## **Abstract**

The Engineering Education and Centers division of the National Science Foundation in Washington, D.C. is looking to improve the efficiency of their panel selection process. Our project team developed a semi-automated workflow management system using SharePoint 2010, along with training materials to assist staff in learning the system. Interviews and demonstrations with EEC employees helped us refine the system to fit the needs of the division. By adopting this system the EEC's panel selection process should achieve greater efficiency.

## **Acknowledgements**

A special thanks to our liaison, Dr. Alan Cheville, as well as our sponsoring agency, the National Science Foundation for the support and direction given on our project. We would like to acknowledge the Engineering Education and Centers division of the NSF and Gwen Hardenbergh for providing guidance and the resources needed to complete our project. We would also like to thank the Department of Information Services, in particular Constance Brown for helping with the project's SharePoint side. Thanks also go to the division members who took time to be interviewed by us as their assistance was very helpful.

Finally, we would like to thank Erin DeSilva of WPI for her contributions as a SharePoint expert and her support to us while we were on campus and in Washington, D.C.

We hope that the recommendations made by our team about a SharePoint 2010 system lead to a promising increase in efficiency of the panel selection process within the division and a basis for a future mega-system incorporating all components of the selection process.

We would like to thank our advisors Creighton Peet and Marsha Rolle for their guidance and support. Their feedback and contributions were invaluable to the success of our project.

## Authorship

This project was split into two types of work: developing the SharePoint site and developing relations and feedback from EEC employees. Ian Lukens and Christopher McAndrews worked to redevelop and improve the EEC SharePoint site and workflows. Victoria Stratton and Emily Miner worked to create relationships through conducting interviews with the EEC employees, scheduled demonstrations, and formatted the final report.

Although each section of the report was split up and written by individuals, each chapter of the report was revised as a group to ensure agreement and cohesion.

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The training materials and developer's manual were created by Ian Lukens and Chris McAndrews. The interview summaries were written by Victoria Stratton and Emily Miner. The Appendices were edited by all members of the group and each member added their individual references.

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## Glossary of Terms

PARs	Proposal and Reviewer system. This is a database at the National Science Foundation that contains information about panelists, such as their contact information and the number of panels they have served on.
FastLane	A database used by the National Science Foundation that contains information about panels, panel dates, and proposals that will be reviewed at those panels.
SharePoint	A web-based software that is used by businesses for the purposes of collaboration and scheduling tasks.
InfoPath	Software that is used to create custom forms that can be published for general use on SharePoint 2010 websites.
SharePoint Designer	Software that is used in conjunction with SharePoint to set up Workflows that the site uses.
DIS	Department of Information Services. This is the Information Technology division of NSF.
EEC	Engineering Educations and Centers. This is a sub-division of the Directorate for Engineering at the NSF.
Workflows	Automated processes made in SharePoint Designer. Workflows do many things from updating items in SharePoint to sending out reminders based on user settings.
Program Director	Responsible for setting up and running the various panels the National Science Foundation holds. They decide which proposals to award grants.
Program Assistant	Assists the Program Director in making sure that all the logistics of the panel are set up and assists the Program Director during the panel.

## **Executive Summary**

In an effort to maximize efficiency, organizations have adopted technological advances to organize their workflows and increase productivity. One such organization is the National Science Foundation (NSF). The NSF receives over forty thousand research proposals every year, and Program Directors at NSF determine funding for these proposals by using panels comprised of experts whom they recruit from outside organizations. In order to manage the panel selection process more efficiently, the Engineering Education and Centers (EEC) division of NSF is currently looking to make the panel selection process more efficient. The goal of our project was to improve the workflow of panel selection process at the EEC using SharePoint 2010 to create a semi-automated workflow management system.

### **Background:**

The investigation into proper workflow management has been ongoing since the 1970's, and as technology has advanced, so have the ways to formalize workflow. The biggest improvement to the management of organizations has been the development and implementation of computer software. By using new software to automate tasks, organizations can do business more efficiently. A business collaboration platform, like SharePoint, allows users to be more connected and organized. In an attempt to become more organized, the NSF has installed a SharePoint 2010 framework, and within the EEC division, the software is being implemented to help with the panel selection process. A previous WPI project team (in 2011) developed a data collection form linked to the EEC external SharePoint site as a possible alternative and/or supplement to email communication. However, this form had yet to be fully tested or incorporated and was found to be inadequate due to usability issues.

## **Methodology:**

Our goal was achieved through the following objectives:

1. Identify the current workflow of the EEC division in terms of its different program structures.
2. Develop a semi-automated workflow system using SharePoint 2010 that meets the EEC employees' needs when forming a panel.
3. Promote sustainability of the SharePoint 2010 system for the EEC's panel selection process and create instruction to allow for future adaptations.

We met these objectives through a combination of different research methods.

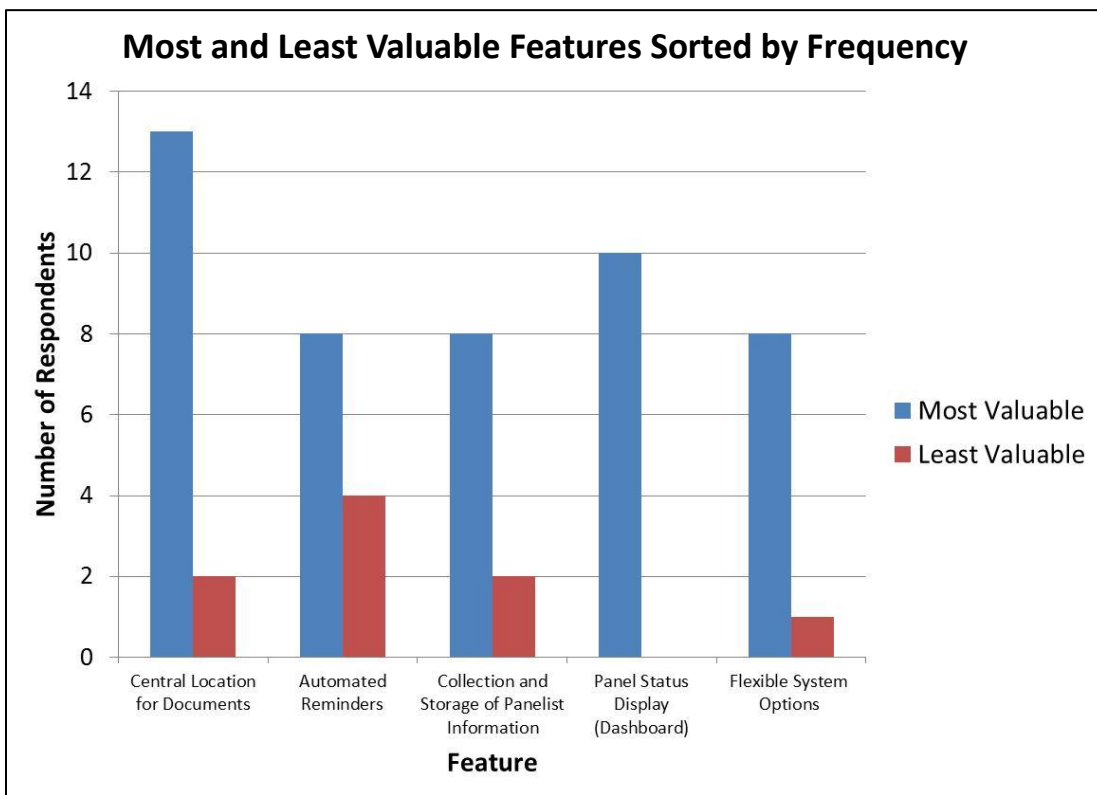
We completed objective one through interviews with EEC employees and Division of Information Services (DIS) staff. These interviews provided data on how EEC employees, panelists, and DIS employees use current technology and interact during the panel selection process.

We completed objective two by refining a SharePoint system that directly satisfied to the needs and expectations of EEC employees. Demonstrations and interviews helped identify in-depth changes and accommodations that needed to be made, while a presentation to the staff with survey questionnaires afterwards resulted in more general feedback about employees' feelings about the system.

We achieved our third objective by creating supplementary documents such as training materials, a testing protocol, and a developer's manual.



We presented our system to the EEC staff and received overall positive feedback. Fifteen of the seventeen employees present filled out the survey questionnaires we provided, and of those fifteen, all indicated that they would likely or very likely use the system as demonstrated. Furthermore, we asked which features they found most or least valuable, and all aspects received more positive than negative votes. These results are summarized in Figure ES - 2. The comments we received indicated that employees wanted additional data gathered or verified, but no comments indicated a dislike of or disinterest in what we presented.



**Figure ES - 2: Most and Least Valuable Features of the SharePoint 2010 System**

## **Final Recommendations:**

To further increase the efficiency within the EEC division, we have provided the following recommendations:

- We recommend that the EEC division adopt the SharePoint 2010 system we developed to manage the panel selection process.
- We recommend that the EEC continually collects feedback on the system to refine it so it fits the changing needs of the division.
- We recommend the Administrative InfoPath forms be redeveloped in a more suitable platform for easier scalability and updating.
- We recommend that the EEC division use our training manuals and develop further training material as the system improves.
- We recommend that the EEC division work with the Instructional Technology Office of the NSF to hold training sessions where employees can go through basic tasks to learn how to effectively use the SharePoint 2010 system.
- We recommend that the EEC investigate the potential for developing an archive of all panelists.
- We recommend that the EEC further automate employee and panelist travel plans using SharePoint 2010.

In summary, if adopted the proposed SharePoint 2010 panel selection process could save the NSF-EEC division time and resources when organizing review panels.

# 1 Introduction

In order to stay competitive and maximize resources, companies are scrutinizing the efficiency of their internal operations (National Institutes of Health, 2012; Rockefeller Foundation, 2012e). The adoption of organized workflows has combined with new advances in technology to permit the automation of certain tasks (Georgakopoulos, Hornick & Sheth, 1995). This combination allows groups to achieve greater efficiency, which in turn lowers the time it takes for an organization to meet its goals. The development of efficient workflows and helpful computer automation must also take into consideration the time constraints of employees, who must learn how to implement new methods and use new software. Therefore, this optimization task requires a thorough understanding of an organization's activities and goals. One organization that could benefit from efficient workflows and computer automation is the National Science Foundation (NSF).

The NSF (2012b) receives over forty thousand research proposals every year. The Program Directors at NSF determine funding for these proposals by using panels comprised of experts whom they recruit from outside organizations. Differing scheduling needs, a large variance in the expertise needed to review these proposals, and conflicts of interest make this recruitment process a challenging undertaking. Previously, the Engineering Education and Centers (EEC) division did not have a universal panelist recruitment protocol. Recently the EEC began to explore the feasibility of transferring their panelist information lists and recruitment process onto SharePoint websites for easier management. Ideally, the lists would provide easy, universal searching and filtering options of all relevant information to facilitate the selection and scheduling of panelists. The sites viewed by panelists would need to be straightforward to use



and be the sole repository for all information needed for proposal review. In addition, these sites should automate tasks where possible, maintain the privacy requirements of the NSF, organize any deadlines, and keep track of correspondence. Prior to 2012, a fully functioning SharePoint site such as this had not been implemented at the EEC.

Workflow research focuses on identifying processes that could be accelerated or automated by the use of software. Many people have taken time to analyze workflow systems for financial and organizational benefits (Aalst & Hee, 2004; Sharp & McDermott, 2008; Georgakopoulos, et al., 1995). The EEC has made steps towards automating tasks and improving workflow through the use of a web-based software called SharePoint. However, time constraints have made it difficult for the Program Directors and their assistants to fully understand and adopt the capabilities of this software. A previous project team has already investigated the capabilities of SharePoint 2007 for serving the needs of the NSF's EEC division.

Since the previous research on the workflow at the EEC, conducted by a WPI team in 2011 (Dávila, Davis, Rodríguez, & Ziavras, 2012), the NSF's SharePoint software has been updated from the 2007 to the 2010 version. The 2010 version offers many new features that can be utilized to further improve the EEC's workflow. The 2011 WPI research team tasked with creating a SharePoint panel selection system for the EEC could not thoroughly test it for potential failure points due to time limitations. The system had to be tested to pass the privacy requirements of a government agency. Certain opportunities for further improvement were missed, such as how to best manage the panel selection process as an administrator.

Our goal was to propose a system that would improve workflow management in the EEC. The main objectives were to identify the current workflow of the EEC division, develop a semi-automated workflow system using SharePoint 2010, and make recommendations for continued

improvement. Interviews and demonstrations with all levels of EEC staff helped us accomplish these objectives. Applying our gathered information, we developed a workflow management system using SharePoint 2010 that streamlined and automated many tasks of the panel selection process. The success of the SharePoint 2010 system to modernize the panel selection process at NSF's EEC is dependent on the employees' ability to adopt it; therefore, we created instructional materials to enhance user experience. If this SharePoint 2010 framework were adopted, the government would save time and resources, and ultimately, researchers seeking funding from NSF would benefit from a faster turnaround time on proposal funding decisions.

## **2 Background Research**

An organization, such as the National Science Foundation (NSF), that conducts peer review panels and awards research grants, must make a concentrated effort to maintain efficiency due to high volumes of proposals received. In order to explain how software tools can facilitate efficient workflow in the NSF's Engineering Education and Centers (EEC) division, this chapter reviews existing research on workflow analysis, the use of SharePoint to improve workflow, and NSF's EEC business processes. Research on workflow provides an understanding of fundamental rules and practices to follow, while understanding the uses of SharePoint enables full utilization of its capabilities. The chapter finishes with an overview of EEC's current panel selection system and previous attempts made to improve the process.

### **2.1 Modern Definition of Workflow**

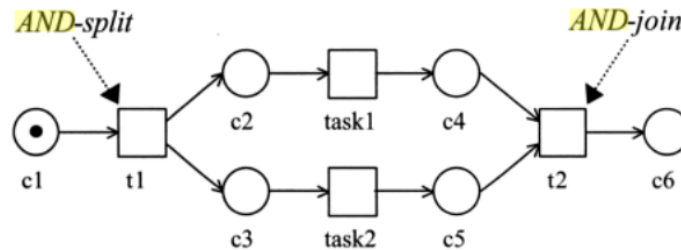
The term "workflow management" and its investigation began in the 1970's when primitive computer systems were able to help with scheduling work tasks for employees (Aalst & Hee, 2004). Businesses quickly realized that using these systems well could lead to tangible benefits for the business, such as more accountability and a quicker turnaround time on tasks. Since its inception, researchers have investigated workflow management and advanced it with new techniques to improve processes and automate tasks.

#### *2.1.1 Workflow Overview*

The general consensus about workflow today is that it centers on business processes. This raises the question: what exactly are business processes? Sharp and McDermott (2008) describe a business process as any singular result triggered by an event, which can typically be described with a verb-noun combination. For example, "Acquire a business partner" or "produce a laptop"

are considered business processes. Both examples are short and describe what the business must do to reach completion of a process. An entire workflow is made up of many business processes, each of which can further be made up of sub-processes, and so on until the processes are just collections of simple tasks (Georgakopoulos, Hornick & Sheth, 1995). By mapping out the relationships among all of the smaller parts, workflows become manageable. Segments that can be automated or simplified become revealed, and improvements to the workflow system can be realized.

The relationships among business processes are often mapped out in a process diagram to allow visualization of the system (Aalst & Hee, 2004). Basic structures within a process diagram are sequence, selection, parallelization, and iteration. Parallelization and sequence structures are shown in Figure 2-1. A parallelization structure occurs following the AND-split and contains the two lines of tasks that converge with the AND-join. The sequence structure is shown by the layout of the figure - step c1 precedes t1 and that precedes c2 and c3 etc.



**Figure 2-1: Parallelization and sequence structures**  
(Aalst & Hee, 2004, p.54)

These structures combine to give a full view of a workflow process as each comes with its own rules: items in a sequence must be completed in a particular order, items in a selection have an element of choice, items done in parallel can be run with other items at the same time, and items with iteration are repeated for a set number of times. The benefits of creating a system with these

tools are that they are intuitive to follow for the layperson and are a basis for analysis about what can be improved upon at a later time.

### *2.1.2 Workflow Improvement*

Workflow systems are never perfect and require continuous improvement. The method for improvement can be divided into three steps: understanding the current process, establishing scope and goals, and designing its replacement process (Sharp & McDermott, 2008). To fully understand the current process, everything about the current roles must be established such as the task the process accomplishes, how it accomplishes the task, and any process restrictions or constraints. The second step, establishing scope and goals, involves modeling the workflow and creating a list of variables affecting the performance of the task. Finally, the new process can be designed by selecting what can be done better and restructuring the new workflow with the redesigned task in place. This three step process can be iterated as many times as needed or as business requirements change.

### *2.1.3 Workflow Automation*

Organizations achieve differing degrees of automation depending on the type of workflow. Every institution has its own methods and organization of employees that the institution uses to implement workflow, but there are often several archetypes of systems that can be used (Aalst & Hee, 2004). Examples of systems include: office information systems, knowledge-management systems, decision-support systems, and control systems. Office information systems are programs such as the Microsoft Suite or Microsoft InfoPath 2010, a tool that can create forms and gather data (Microsoft, 2012a), that require human interaction to produce anything useful. Knowledge-management systems provide information that is useful to a specific job or specific worker. One such knowledge-management system is a search engine like

Google. Decision-support systems utilize information to show a user data in a logical manner that facilitates making a decision. Examples of such systems range from simple flowcharts that a user follows to reach a result to computer systems that give advice based on preexisting conditions. For example, Turbo Tax (2012) calculates a tax return based on the personal information entered. A control system is any system that can automatically calculate and implement decisions (Aalst & Hee, 2004). A commonplace control system is the computer system handling fire sprinklers; it automatically makes a decision to turn on the sprinklers in the event of unusual heat without any human interaction. Groups implement combinations of the above systems to achieve automation. Automation comes in two forms: anything involving a control system or a chain of actions that can be computerized.

## **2.2 SharePoint 2010**

Microsoft Office SharePoint Server 2010 (MOSS) is a business collaboration software that allows users to be more connected and organized. Currently, the EEC division of the NSF has a data collaboration system built on SharePoint 2007 that has been upgraded to the 2010 version (R. Cheville, personal communication, September 17, 2012). However, the division does not yet utilize this system for the panel selection process as a centralized communication and data space for storing and updating information.

### *2.2.1 SharePoint Features for Improving Workflow*

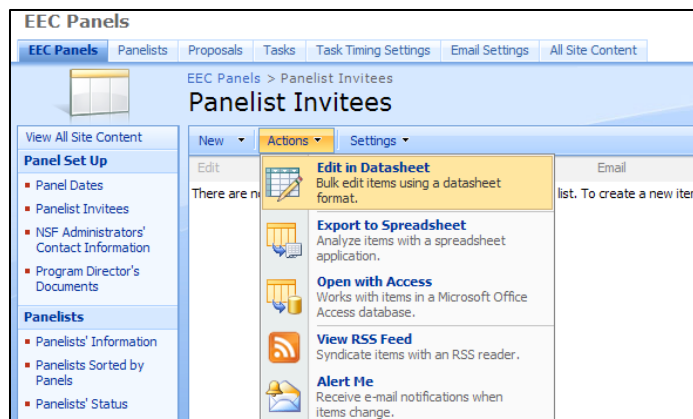
SharePoint software supplies many tools for enhancing productivity. It allows administrators to manage web content and create customized programs and allows users to communicate and organize themselves effectively (Microsoft, 2012c). Permissions delegation options in SharePoint permit sites to be locally administered without security concerns and allow for customization to each site's specific requirements.

In their sites, administrators can create organizational tools such as work calendars, task management, and data lists that help users meet deadlines and fulfill requirements (McKenna, Laahs, & Veli-Matti, 2010). These lists can contain fields such as priority, due date, description, and percent completion for each activity. Those with the required privileges can also assign tasks to users and have the option to upload new tasks when necessary. Administrators may customize data lists to offer any information they want to keep easily and universally available, such as relevant contacts or project details. These lists can hold any information due to their flexibility. For example, adding a list for proposals with fields for its authors, their universities, and other related information allows these data to be easily viewed and updated.

SharePoint also hosts document libraries (McKenna et al., 2010). Users can modify, upload, and download documents in synchronization, or the libraries can store read-only help documents available to all users.

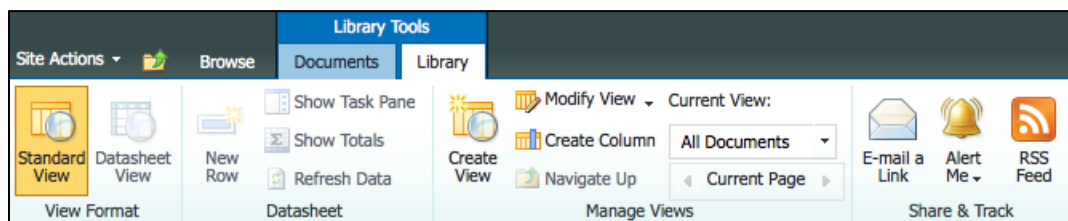
### *2.2.2 Changes in SharePoint 2010*

New features in SharePoint 2010 offer more opportunities for improving usability and automating workflow (McKenna et al., 2010). Although SharePoint 2010 is not a complete redesign, it does contain significant architectural changes. Specifically, the user interface (UI) and navigation has substantially changed. SharePoint 2007 utilized drop down menus as seen in Figure 2-2.



**Figure 2-2: SharePoint 2007 drop down menus (Dávila, Moore, and Ruck, 2010)**

In SharePoint 2010, these menus have been moved and condensed into the ribbon UI shown partly in Figure 2-3. Different headings and controls have also been added. Users accustomed to the 2007 display would need appropriately updated training material to avoid confusion.



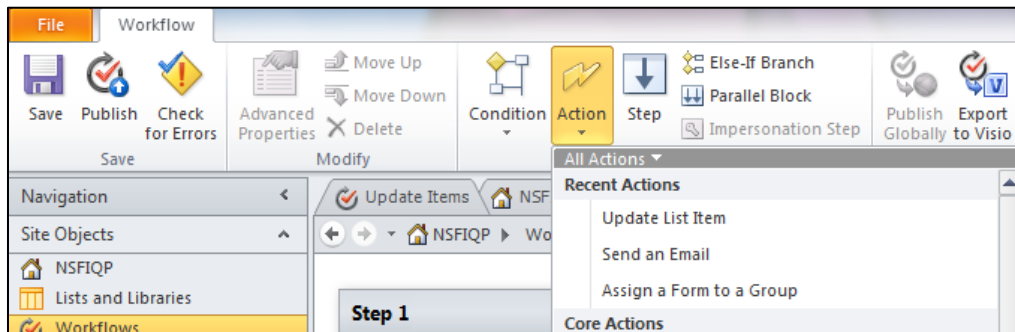
**Figure 2-3: The SharePoint 2010 ribbon UI (Microsoft SharePoint 2010, 2012)**

A specific enhancement of SharePoint 2010 is the ability to link an external database with a SharePoint site (Microsoft, 2012d). In other words, a database already used to manage NSF information relevant to the panel selection process could be viewed and used directly on a SharePoint site. Additionally, this same concept can be applied to store externally managed lists. Information maintained and updated off the SharePoint server can therefore be linked to the server and viewed from the site.



### 2.2.3 Other Software Used in Collaboration with SharePoint

Microsoft designed SharePoint with its other products in mind. As a result, SharePoint 2010 synchronizes well with other Microsoft software (Microsoft, 2012d). The principle collaborator with Microsoft Office SharePoint Server (MOSS) is SharePoint Designer, which authorized users can access from the web ribbon. SharePoint Designer has many capabilities ranging from customizing site appearance to creating new web applications. Most importantly, it offers the ability to customize workflows to automate tasks and create user friendly solutions, which do not require coding experience, to common business problems. Using triggering events such as receiving new data, developers can design workflows that send emails to users or update list items. This way, information libraries can update automatically – saving time and ensuring accuracy.



**Figure 2-4: SharePoint Designer UI  
(Microsoft Office SharePoint Designer 2010, 2012)**

Like Designer, Microsoft InfoPath can be accessed through the ribbon user interface (Microsoft, 2012d). This software allows users to create and modify any form the site uses. This helps when adding items to a list or collecting information about users. Custom forms can collect and centralize any desired information. InfoPath and SharePoint can transfer data to and from each other based on the developer's needs, and InfoPath provides more capabilities for utilizing

relationships between lists on the site. SharePoint creates default list templates that users may refine in InfoPath to query another list's data or other external input.

SharePoint's document repositories work with Microsoft Office programs (McKenna et al., 2010). Applications such as Word, Excel, and PowerPoint give users the option to save directly to SharePoint sites, and SharePoint has buttons to open any document in its respective Microsoft platform.

### **2.3 Workflow at the NSF's EEC**

The NSF (2012b) is a federal agency dedicated to promoting the advancement of science and education by awarding grants to research proposals through a peer-review panel process. This agency has seven directorates that have different divisions, which each manage different programs (National Science Foundation, 2012e). The EEC division under the Directorate for Engineering wants to improve their workflow system related to the panel selection process (Dávila, Davis, Rodríguez, & Ziavras, 2012). This section describes the workflow structure of the EEC, panel set-up process, and previous attempts at improving workflow.

#### *2.3.1 Workflow Structure of the EEC*

Of the twenty-one members of the EEC division, six employees are Program Directors, five employees make up the Program Support Staff, and one employee is a Program Support Manager (Engineering Education and Centers, 2012). Depending on the program within the EEC and its director, a panel process could be set up differently than other programs in the division. The Program Support Staff help the Program Directors with tasks, and the Program Support Manager makes sure the Program Support Staff have the abilities and resources to complete their tasks smoothly. This section describes each member's role in the panel selection process.

Program Directors across the division have similar tasks when setting up a panel for each program. Under the EEC there are ten programs. The main difference between the programs is how many times proposals are requested each year. For instance, the Engineering Education program solicits proposals twice a year (R. Cheville, personal communication, November 7, 2012), whereas the Nanoscale Science and Engineering program requests proposals once every twelve to eighteen months (C. Read, personal communication, November 1, 2012). The different number of proposal submission opportunities results in different numbers of panels for each program. When a panel is held, the Program Directors find volunteers willing to serve as panelists, assign roles to the panelists for each proposal, and run the panel. Most Program Directors resort to forming a matrix similar to the one shown in Figure 2-5, where the proposal numbers, authors, and titles are listed horizontally, and the panelist can locate his or her own name to find what specific task he/she has been assigned for each proposal. Panelists also fill in their conflicts of interest for the proposals, so the Program Director may need to make several revisions to the matrix. The Program Support Staff help the Program Director during this process.

Research in Engineering Education Panel Matrix				Panelist #1	Panelist #2	Panelist #3	Panelist #4	Panelist #5	Panelist #6	Panelist #7	Panelist #8
Proposal #	PI Name	University	Title								
1265642	Jon Smith	Worcester Polytechnic Institute	Actionable Representation of Engineering Student Motives	S	R	R	L				
1651596	Jake Brown	Mississippi State Univ	Framework to Study and Assess the Ethical Issues		S	R	R	L			
1265654	Matt Con	Arizona State University	Instructional Strategies in Engineering Education			S	R	R	L		
1266322	Eli Hummer	Northwestern University	Development and Validation of SharePoint	C			S	R	R	L	
NL:1265351	Ali White	Arizona State University	Development and Validation of SharePoint								
1265657	Lauren Siegler	U of Nebraska-Lincoln	Factors in the Development of Engineering Students	R*	C			S	R	C	L
<b>R</b>	<b>Reviewer- responsible for providing a review of the proposal on intellectual merit and broader impact.</b>										
<b>S</b>	<b>Scribe- same responsibilities as reviewer and takes notes then writes up a summary that captures the main points of panel discussion.</b>										
<b>L</b>	<b>Lead Reviewer- same responsibilities as reviewer, but starts off discussion with brief summary of proposal.</b>										
<b>C</b>	<b>Conflict of Interest. Panelist may not read proposal, and must leave room during discussion.</b>										
NA*	<b>Not Assigned- you were initially assigned this proposal, but due to other's who identified conflicts of interest, you no longer have to read this proposal.</b>										
*	<b>New Assignment- you were not initially assigned this proposal, but due to conflicts of interest that arose you now have a the role indicated (see above descriptions)</b>										
<b>You are responsible for reviewing the proposals listed in this matrix. The Fastlane system may list you as a "secondary reviewer" or other type of reviewer depending on how the system is set up by our program staff. This matrix will be used in the panel for both reviewer assignments and for the proposal discussion order.</b>											
<b>If a proposal number starts with "NL.", has grey text, and no reviewer assignments, it is part of a collaborative proposal (same proposal submitted by multiple institutions). This proposal is identical to the lead proposal on the collaborative effort (title and reviewer assignments listed), found immediately above the blank row. You only need review the lead proposal.</b>											

**Figure 2-5: Example Matrix that Program Directors make for each panel (adapted from R. Cheville, personal communication, November 5, 2012).  
\*Note: All Names, Universities, and Titles have been changed to maintain privacy.**

The Program Support Staff are responsible for communication with panelists before and after the panel meetings. Program Support Staff take over the panel organization process after the Program Director has finalized his/her list of panel members (L. Peak, personnel communication, November 13, 2012). Before the panel, the staff make sure that all the panelists fill out the necessary forms and are able to view the proposals in FastLane. FastLane is a government site that stores all of the proposals to be reviewed as well as the review summaries and submissions of the panelists. The Support Staff set up the panelists on FastLane so the panelists can review and complete their assignments for each proposal. The Program Support Staff send out forms and guidelines to all the panelists informing them of what a conflict of interest is. The panelists then indicate if they have a conflict of interest. The staff members also have to book a conference room to hold the panel (M. Horner, personnel communication, November 19, 2012). The room is either booked within the NSF or in a nearby hotel with a conference room. Whether the room is inside or outside the NSF, the program assistant makes arrangements with the Information Technology staff to have computers set up for each of the panelists. Finally, after the two-day panel has taken place, the staff confirm whether the panelists' travel expenses have been refunded. The Program Support Manager makes sure that the Program Support Staff are properly trained in the correct procedures so that they can effectively help the Program Directors.

### *2.3.2 Panel Process*

The selection of panel members for reviewing submitted research proposals is an intricate and time-consuming process. Since the NSF (2008) gives out many grants for cutting-edge research being performed in the science and engineering fields, the panelists, who help make the decision about which proposals are worthy to be funded, must be carefully chosen. To maintain a

“fair, competitive, transparent merit-review process” (paragraph 2), the selected panelists must be able to determine the intellectual merit of the proposed project as well as its broader impacts. Program Directors have guidelines for selecting panelists in order to ensure that the reviewers can provide useful information about the appropriate proposal. With these criteria, reviewers must have special knowledge of the science and engineering subfields in the proposed projects, a broad knowledge of subfields involved in the other proposals reviewed, and knowledge of the infrastructure of broader impacts that the proposal could bring. A panel must also have diversity in panelists’ career stage, review experience, and affiliated organization. Knowing what an ideal panelist would be, Program Directors choose panelists based on portfolios or by suggestions from other Program Directors (Program Director Anonymous, personnel communication, November 19, 2012).

Program Directors assign each of the proposals a primary reviewer, secondary reviewer, and scribe, so that every proposal is reviewed by a minimum number of three people as outlined above in Figure 2-5 (Dr. Cheville, personnel communication, November 13, 2012). During the two-day panel meeting, the primary reviewer gives a summary of the proposal and key points from his/her written, submitted review, and then the secondary reviewer comments on any additional points, and finally the conversation is opened to general discussion. The scribe writes any comments into a panel summary to be reviewed by the Program Director. The first day of the panel is spent reviewing every proposal and granting a preliminary ranking. The second day is spent ranking each proposal based on merit and funding priorities. The Program Officers reference the rankings when finalizing which proposals to award funding.

### 2.3.3 2011 Attempt at Workflow Revisions

In 2011 a project team from Worcester Polytechnic Institute worked with Dr. Alan Cheville, an EEC Program Director, at the NSF to try to improve the panel selection process. Ignacio Davila, Nicole Davis, Wilmann Gomez Rodriguez, and Evan Ziavras (2011) helped to automate workflows and to organize the panelists' information using SharePoint 2007. As part of their project, the team developed a virtual invitation using Microsoft InfoPath 2007 that could be sent out to potential panelists. In the invitation each panelist was prompted to fill out the form with his or her information, and the responses would automatically be filled into a spreadsheet in SharePoint. The first page of the InfoPath form is shown in Figure 2-6. Panelist availability determines if the panelist is allowed to continue in the panel selection process and fill out the other forms.

**National Science Foundation**  
**Review Panel Invitation Form**

November 08, 2012

**Personal Information**

First Name:  Last Name:  Phone Number:  E-mail:

Institution:  Expertise:

**Confirm Availability**

Please check "Yes" for the dates you would be available to serve as a reviewer for an NSF Proposal Review Panel.

	Start Date	End Date	Available
Panel #1	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #2	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #3	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No

Save and Close Submit

**Figure 2-6: First page of InfoPath form that panelist would view (Davila, Davis, Rodriguez, & Ziavras, 2011, p. 40)**

The form that the 2011 WPI project team developed had the potential to remove a lot of the paperwork and emails that Dr. Cheville and his staff have to sort through and organize. Unfortunately, the team did not have time to fully test the form so that it could be implemented.

## **2.4 Summary**

Since our project for the National Science Foundation – Engineering Education and Centers division involves developing a formal workflow system to improve the panel selection process, we had to define modern day workflow as well as the exact steps of the panel selection process. Furthermore, investigating the efforts of the 2011 WPI Project Team to formalize workflow provided information on what has been attempted in the past and the methods used, and implications of the transition from SharePoint 2007 to SharePoint 2010. The background information gathered helped us generate the research questions that shaped our project. The methodology we used to answer these research questions is described in the next chapter.



### **3 Methodology**

The goal of our project was to propose a workflow management system that simplifies the panel selection process for the National Science Foundation's (NSF) Engineering Education and Centers (EEC) division that could be adopted and consequently used to increase efficiency within the division. In order to achieve this goal, we developed the following objectives:

1. Identify the current workflow of the EEC division in terms of its different program structures.
2. Develop a semi-automated workflow system using SharePoint 2010 that meets the EEC employees' needs when forming a panel.
3. Promote sustainability of the SharePoint 2010 system for the EEC's panel selection process and create instruction to allow for future adaptations.

This chapter describes the methods we used to gather input from EEC employees and how we developed a SharePoint 2010 panel selection system.

#### **3.1 Objective 1: Determine the Current Workflow Patterns**

In order to determine how to develop a semi-automated panel selection system for the EEC division, we had to understand the internal workings of the division. We needed to distinguish between the different roles each member of the division has as well as his/her specific responsibilities for the panel selection process, and the lines of communication between Division Director, Program Directors, Program Assistants, and panelists.

In order to achieve our first objective, we first had to understand the specific functions of the different people within the EEC division. In order to begin communicating with the EEC staff, we were first formally introduced by our NSF liaison, Dr. Alan Cheville, an EEC Program

Director, at a staff meeting with the Division Director, Program Directors, and Program Assistants. This initial meeting introduced the team and our project to the employees, and as we observed the staff during the meeting, we were able to begin to determine the structure and interactions within the EEC. We also observed employee interactions during informal staff meetings in the office area. These informal meetings allowed us to observe the different responsibilities and tasks that each member of the EEC had to accomplish.

There are seven directorates at the NSF, each of which consists of separate divisions, and within each division there are a number of different programs. Our first objective was to identify the current workflow of the EEC division in terms of the different programs' structures, as each program has different protocols and methods for the panel selection process. Additionally, we investigated what resources were at the disposal of the EEC employees. To complete this objective we implemented two distinct research methods: interviews and observation.

We held interviews with Program Directors, Program Support Staff, and personnel from the Department of Information Systems. We performed these interviews to gather information about the current technologies at the NSF, to learn about the migration of SharePoint 2007 to 2010, and to understand the exact steps and processes involved in setting up a panel. Interviews can be either very effective or difficult to run depending on the interviewee and how the interviewer asks the questions. To avoid one worded answers, that do not provide much information, we tried to make our interview questions open ended to stimulate conversation. Protocols for each of our interviews can be found in Appendices A, B, C, and D.

In order to gain knowledge on the technologies used at the NSF, we interviewed personnel from the Department of Information Systems (DIS). By recommendation from Dr. Cheville, we chose to interview Constance Brown. Constance Brown is a computer specialist at the NSF who

functions as a SharePoint Developer and helped the 2011 WPI Project Team with their SharePoint 2007 system. As a DIS employee, Constance Brown had information about SharePoint 2010 as well as knowledge on how NSF databases relate to the panel selection process. The informal interview with her allowed us to build a foundation for a strong working relationship where we could email her questions and ask her to implement changes to our site with SharePoint Designer since only DIS employees can use this program to configure the EEC SharePoint sites. The interview protocol for the DIS staff member Constance Brown can be found in Appendix A.

We interviewed the Program Directors and Program Support Staff to learn about the panel selection process in greater detail. These interviews provided insight into the various methods each employee uses to set up a panel. The Program Directors gave opinions on what elements of their current personal panel selection process are working well and what could be improved, which was useful in developing our SharePoint 2010 system. The Program Support Staff interviews provided insight into the smaller steps that need to be accomplished to organize a panel. Once the Program Directors have organized who they want in each panel, the Program Support Staff take over the responsibility of making the panel into a reality by corresponding with all the individual panelists. Due to our limited time at the NSF, we interviewed only four of the six Program Directors and five of the eight Program Support Staff members within the EEC division. We chose the interviewees by their availability, as scheduling was difficult. The interview protocol as well as summaries of the interviews with Program Directors, Program Support Manager, and Program Support Staff can be found in Appendices B, C, and D.

Another method we implemented in order to assess the workflow of the EEC and the panel selection process was observation. There are three different types of observation that can be

implemented in research: participatory, indirect, and direct. Participatory observation is when the researcher inserts him/herself into the environment that he/she is studying (Wilson, 2010). This method of observation allows the researcher to learn hidden routines and to collect data in a natural setting; however, this method takes a very long time to collect unbiased data and is hard to develop quantitative data. Indirect observation is when a researcher must rely on an interpretation of what was left behind (DeWalt & DeWalt, 2002). This particular method is evidence-based and requires the researcher to draw his/her own conclusions. Direct observation is when the researcher is present during an activity but does not interact with participants until after the observing period is over (Rauterberg, 2012). Due to the nature of our project, we did not use participatory observation or indirect observation while at the EEC, but instead we used direct observation of the employees during a panel.

During our time at the NSF, we were able to observe an Engineering Education panel and learned about the resources necessary to run them. While attending the panel, we relied on direct observation to gather data about the exact role of the Program Director and the panel's flow. We were able to speak with seven of the eight panelists about the panel invitation process, specifically their likes and dislikes about the email communication and the final matrix that outlined roles each panelist had for each proposal (as seen previously in Figure 2-5). The summary of our observations, the informal conversations, and key topics we discussed can be found in Appendix E.

### **3.2 Objective 2: SharePoint 2010 System Development**

Meeting the EEC staff and identifying problems in the panel selection process helped us to refine the SharePoint 2010 panel set-up process we had been working on. The information gathered from our first objective provided the necessary information to complete our second

objective: to develop a semi-automated workflow system using SharePoint 2010 that meets the EEC employees' needs when forming a panel. We used the knowledge gained from our interviews and observations to determine key features our new panel selection workflow should have. After gaining permissions from DIS to work on the EEC external SharePoint site, we developed the new SharePoint 2010 workflow system, demonstrated it to the staff to show its full capabilities, and tested its effectiveness.

Since we wanted to teach the EEC employees the different capabilities of the SharePoint 2010 workflow system, we performed demonstrations. According to University of North Carolina professor Heather Coffey (2012), demonstrations show how to do a task using sequential instructions resulting in the learner being able to perform the task. There are two types of demonstrations: lecture-demonstration and demonstration-performance (Sola and Ojo, 2007). A lecture-demonstration is when the teacher goes through the steps of a technique while providing an oral explanation. A demonstration-performance is a method of teaching where the learner performs the task. Demonstrations can be effective in stimulating interest and presenting ideas and concepts more clearly, but demonstrators must be careful that the demonstration does not fail, that learner participation and input is not limited, and that the equipment is fully tested and prepared beforehand (Purdue University, 2001). While at the NSF, we performed a series of formal and informal lecture- and performance-demonstrations to EEC employees.

In order to ensure that the panel selection process would work with our SharePoint 2010 workflow, we ran formal performance-demonstrations for one Program Director and one Program Support Manager of the EEC division. The Program Director we chose was Dr. Alan Cheville, who has extensive knowledge of SharePoint and the ability to give focused feedback. The Program Support Manager chosen was Gwen Hardenbergh due to her inside knowledge of

the panel selection process and her willingness to work with us. We wanted both opinions so that the different needs of the director and manager were met. After we completed our SharePoint 2010 system, we gave a demonstration for both the Program Director and the Program Support Manager where we allowed them to go through the steps on their own and give us feedback. We gave another demonstration to the Program Director to show the final system we were presenting and updates we had made to it. Summaries of the formal demonstrations can be found in Appendix F. Multiple informal demonstrations were given to other staff members during interviews to help keep our project focused and allow us to make suggested changes throughout our time at the NSF. The demonstrations were accompanied with informal conversations about the new SharePoint system to receive feedback. These demonstrations helped prepare us to hold a successful system demonstration to the EEC staff and conduct a focus group.

To display the feasibility of using the SharePoint 2010 system to the division, we formed a focus group using a lecture-demonstration approach. We were allotted a half hour during the bi-weekly EEC staff meeting to hold our focus group. Seventeen of the twenty-one staff members were in attendance. After the demonstration of our SharePoint 2010 system, we had an open discussion to solicit feedback regarding the participants' thoughts about the system's usability, features, and design. Positive feedback was used to determine if our suggested changes would remain, while negative feedback indicated areas needing further change or improvement. We gave all the EEC employees a survey questionnaire to fill out at the end of the meeting with specific questions that could be analyzed quantitatively. We also included a section for free responses so that staff could provide us with additional comments that were not mentioned in the open discussion. This information allowed us to tailor our SharePoint site specifically to the EEC

employees' needs and desires. The post-demonstration survey questionnaire can be found in Appendix G.

### **3.3 Objective 3: Promoting Sustainability**

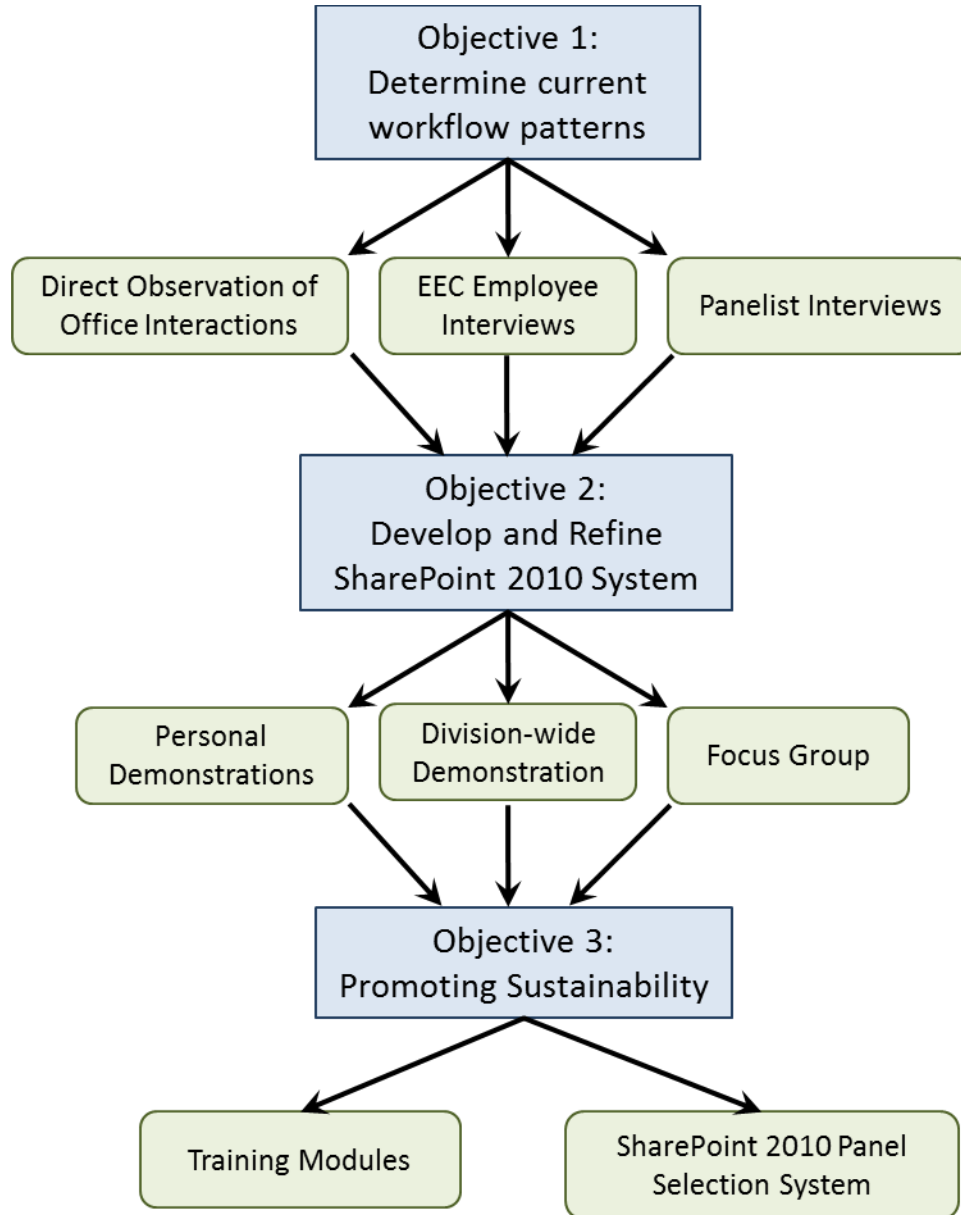
In order to enable others to use our SharePoint 2010 panel set-up process, we produced training modules that illustrate how SharePoint can be used to perform different actions. The previous interviews with EEC and DIS employees helped us to understand what parts were most important, and the results from the demonstrations showed us what features of our SharePoint 2010 system were the most confusing. These results yielded focus areas for our training modules.

To measure the effectiveness of the training modules, we held a training sessions with EEC Program Director Barbara Kenny and EEC Program Assistant LaTanya Sanders-Peak. We completed this step to verify that our modules were suitable. The participants were chosen by availability and willingness to work with us. We measured the effectiveness of the modules by discussing how useful each participant found the trainings. We had each participant read through the manuals and make comments on confusing parts or steps that were out of order. If the participant got stuck at any point, we made sure to clarify that particular section in the training module. We also asked for any additional comments or suggestions for improvement. The summaries of these trainings can be found in Appendix H.

### **3.4 Summary**

Our project focused on developing and testing a formal workflow management system to improve the panel selection process at the National Science Foundation – Engineering Education and Centers division. By working with the EEC division, we were able to complete our three research objectives by implementing a combination of different research methods as displayed in Figure 3-1. The methods we used helped us collect quantitative and qualitative data on how

much understanding the EEC employees have about SharePoint 2010, what reservations some employees may have about switching to the SharePoint 2010 system, and if our training modules on how to best use SharePoint were effective. The success of the SharePoint 2010 system to modernize the panel selection process at NSF's EEC is dependent on employee acceptance. In the next chapter we will present the results of our research and SharePoint site development.



**Figure 3- 1: Concept map of project objectives**



## 4 Results and Analysis

Our evaluation of the panelist selection process within the EEC revealed specific steps in the process that SharePoint 2010 could automate to improve workflow efficiency. Our results follow four main steps:

- Determine EEC employees' and panelists' workflow
- Develop a SharePoint 2010 system based on EEC suggestions
- Determine EEC employee reactions to the proposed SharePoint 2010 system
- Develop supplementary documents to ensure system sustainability

Based on our results, we were able to develop the SharePoint 2010 system to fit the needs of the EEC division.

### 4.1 Analysis of EEC employees' and panelists' workflow

Understanding the different roles of the employees and panelists in the panelist selection process was important for developing a system that fits the needs of everyone in the EEC division. EEC Program Directors and their assistants desired a way to better organize the panelists' information. Through interactions in the office area and semi-formal interviews with EEC staff, we determined the different responsibilities of employees and intra-division interactions.

By interviewing the EEC Program Directors, we gained insights into the differences between each EEC program and the preferences of each Program Director. While each Program Director has his/her own method for organizing a panel, each Program Director faces similar challenges. The range of topics covered in each proposal can be broad, but the focus of each proposal is very specific. From our interviews we determined that a Program Director's most

difficult step in organizing a panel is finding available panelists with the correct expertise to offer an educated analysis of the research proposals under review.

There are two methods common among Program Directors to reach panelists: emailing twenty people at once and sorting through the responses to make a list of panelists, a method Dr. Cheville told us that he implements, or emailing people one at a time and waiting for a response before emailing the next person, a method Dr. Kenny informed us that she uses. Collecting potential panelist's personal information has become an overwhelming task that is full of the possibility for mistakes. The Program Directors we interviewed all agreed that having a standard method for collecting and organizing panelist data would expedite the panel selection process and make it more efficient. A few Program Directors felt that having a web-interface to collect panelist information would ease the workload on the Program Support Staff.

Our interviews with Program Support Staff gave us insight into ways to improve the efficiency of the panel selection process based on their responsibilities. LaTanya Sanders-Peak, a Program Support Staff member, felt that the current method she uses to get information and set-up a panel is adequate; however, she suggested a strong improvement would be to make it a more "green" process. As one Program Specialist described, having a central location online for all the required documents would be easier than sending out emails with numerous attachments. When panelists need to fill out a form, they could download a copy, fill it out, and upload the updated copy to the site. The Program Support Staff are in charge of making sure each panelist has filled out these forms. If all the forms were in a central location on a SharePoint 2010 site, it would make it easier to check for completion and prepare for the panel.

During our time at the NSF, we observed first-hand how a panel is conducted and spoke with many of the participating panelists about their experiences. There was a broad range of

panelists, from first-timers to experienced reviewers, who offered a variety of opinions and suggestions on the panel set-up process. The most common issues we identified were problems with incorrect panel dates, understanding assignments, and recognizing conflicts of interest. Due to confusion caused by too many emails going back and forth, a few panelists found that they had received incorrect dates for the panel they were part of. This increased the email chains between the Program Support Staff and panelists for scheduling corrected travel and lodging arrangements.

Prior to the panel, the Program Director assigns proposals to panelists based on the panelists' areas of expertise. For the panel we observed, the Program Support Staff sent out a matrix of reading assignments and roles of lead, scribe, or secondary reviewer for every panelist. A few panelists found the matrix poorly presented or confusing when determining what proposals they had to read and what their role was for each proposal. If panelists have a conflict of interest (COI) with a proposal, they are not allowed to contribute or even be present for the discussion of that proposal. A few panelists were unsure if they had a COI because they did not know or were uncertain about the COI guidelines.

The interviews we conducted with the EEC employees allowed us to analyze the needs of the division for a system to improve their panelist selection process. To understand the entire process completely, we spoke to real panelists and heard their opinions and suggestions. From these interviews and conversations we found common themes and ideas for improvement: create a web-interface, make it a more "green" process, and organize the information sent to panelists in a manner that is easier to comprehend. We used these ideas to modify the SharePoint 2010 system we were developing.

## **4.2 Develop a SharePoint 2010 system based on EEC suggestions**

Our main objectives for development of the SharePoint 2010 system were to fix any problems that remained from the 2011 WPI project, to introduce a better SharePoint system to EEC, and to improve upon and update the system based on feedback from EEC employees and our knowledge of workflow systems. Specifically, we wanted to understand the current workflow of the panel selection process, looking for areas suitable for automation or improvement due to out of order steps or opportunities for parallelization.

### *4.2.1 Changes to the 2011 SharePoint 2007 System*

As our work was an extension of the 2011 WPI research project, we wanted to maintain what we could from their accomplishments. However, we experienced usability issues and inconsistencies between their system and the needs of the Program Directors that required correction. Additionally, with the migration from the 2007 to 2010 SharePoint server, all of their workflows, the automated processes they created in SharePoint Designer, did not function with the new server and needed re-implementation while other workflows required redesigns due to fundamental flaws.

The initial concern, according to Dr. Alan Cheville, was that nothing was easy with the system developed in 2011. The only improvements came from automated email reminders and an InfoPath form for collecting panelist data, which needed usability modifications to increase its effectiveness. Notably, its final screen merely showed a list of proposal numbers that would be meaningless to the average viewer and therefore not fulfill its purpose as a way to review assignments and check for and indicate any additional conflicts of interest based on those assignments. To fix this, we changed the display to show proposal number, title, principal investigator, and university affiliation for each proposal. This screen, pictured in Figure 4-1, also

provides a more personalized approach for each panelist, eliminating the problem of digging through a spreadsheet to find his or her specific assignment information.

**Assignments Review and Approval Section**

[Click Here to List Additional Conflicts of Interest](#)

<b>Panel Number</b>	<b>Panel Start Date:</b>	<b>Panel End Date:</b>
1	November 14, 2012	November 19, 2012

**Lead:**

- #1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute
- #1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute

**Scribe:**

- Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute
- #1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute

**Reviewer:**

- #1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute
- #1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute
- #1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute

[Close Form](#)

**Figure 4 - 1: Assignment review screen of panelist InfoPath form**

As an administrator, invitee and panelist information was still difficult to view and use to effectively make assignments or selections. We identified two tasks in need of improvement—assigning proposals and panelists to panels and assigning panelist roles for proposals. Data such as conflicts of interest and availability were collected by the site, but only viewable in lists of meaningless proposal numbers or isolated yes/no fields that could still be ignored when making assignments. In order to fix these issues, we began development of two administrative InfoPath forms that would use the data collected from the panelists and proposals lists, display it in an easily interpreted way, and then allow Program Directors to make decisions based on this information.

We made our first form to help Program Directors assign proposals and panelists to panels. The skills and knowledge of a panelist must correlate with the topics of proposals being reviewed in a panel. Therefore, we condensed this information into a single screen, shown in Figure 4-2, instead of having to constantly search through separate proposal and panelist lists. We also used panelists' availability information to sort them into separate boxes, further increasing the usefulness of the form as a knowledge management system while also ensuring that the Program Director could not assign panelists to panels that panelists had indicated they could not attend. This decision support feature helps prevent mistakes that cause more work and stymy workflow.

<b>Proposals:</b>	<b>Panel 1:</b>	<b>Panel 2:</b>	<b>Panel 3:</b>
1156372 Playground Equipment Classification 1187934 Improving Workflow at the National 1578954 Marketing Worcester Polytechnic 1645315 Environmental Compliance: Develop 1784632 Marcellus Shale: Cementing and W	1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of West Virginia University	1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute	1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute
<input type="button" value="Assign to Panel 1"/> <input type="button" value="Assign to Panel 2"/> <input type="button" value="Assign to Panel 3"/> <input type="button" value="Assign to Panel 4"/> <input type="button" value="Assign to Panel 5"/>			
<b>Panelists:</b>	<b>Available for Panel 1:</b>	<b>Available for Panel 2:</b>	<b>Available for Panel 3:</b>
<input type="button" value="Start Assigning Panelists to Panels"/> <p>*** NOTE: Only begin using this control after you have finished assigning proposals to panels. Panelists will receive emails informing them of their assigned panel.</p>	Lauren Black - Baltimore - Science  Justin Debenetto - RPI - Computers  Christopher McAndrews - WVU - Afterschool Education via Clubs  Emily Miner - Boston University - Elementary Education Research  Maurice Sinner - Georgetown - Space	Joanne Davis - Arizona State University - Marine Biology  Emily Miner - Boston University - Elementary Education Research	Lauren Black - Baltimore - Science  Joanne Davis - Arizona State University - Marine Biology  Casey McNeal - Rice - Math

**Figure 4 - 2: Administrative form for assigning proposals and panelists to panels**

We also implemented features on the form to certify that Program Directors assigned proposals to a panel before they assigned panelists to the panel. Otherwise, a panelist could start the next step of checking their conflicts of interest, and find that they had none, because there were no proposals assigned to that panel yet. Therefore, we designed the form so that the Program Director will receive a warning to finish assigning proposals in order to allow assignment of panelists.

The form for assigning panelists roles for proposals (lead, scribe, reviewer) was helpful for making use of the collected information. Before, the panelists' lists of conflicts and preferences were kept solely as proposal numbers separated by semicolons, and the only way to get any use out of this information was to have multiple screens open at once while scanning proposal numbers for matches. Directors also had to double-check that the panelists and proposals shared the same panel. Since our new InfoPath form automatically sorts by this information, Program Directors cannot assign panelists to a proposal for which they have indicated a conflict.

**Figure 4 - 3: Administrative form for assigning panelists to proposals**



In the form, seen in Figure 4-3, different boxes indicate preferences while buttons at the top navigate to different panels. On the right, next to each assigned panelist's name is a number, indicating how many times he/she would hold the specified position. This helps facilitate an even and correct distribution of panelist responsibilities.

During the creation of these forms, we encountered several limitations of InfoPath. The least impactful were design limitations due to the limited available controls. This caused us to use more buttons and a less intuitive design than desired. More importantly, the program was not made to update multiple list items, and therefore we implemented workflows to supplement the process. This too proved less than ideal, as the forms could not update in real time, so the display might not match the actual data. In practice, this should not affect the use of the system, as everything should correspond eventually, but our personal communications with a DIS employee indicated that it might stress the server.

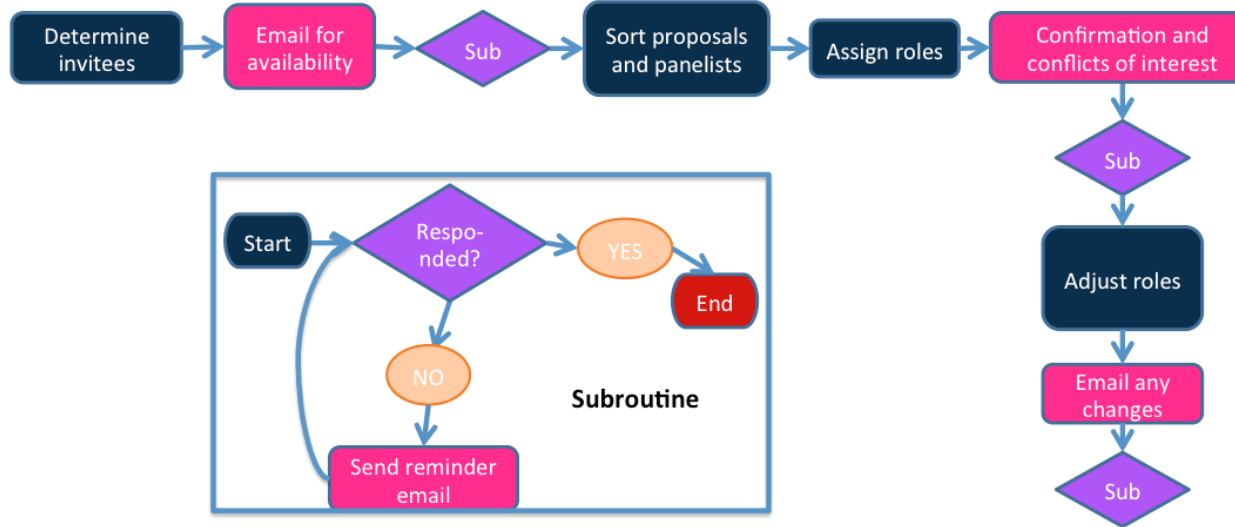
In addition to re-implementing the workflows left by the 2011 project team, we found and corrected two major flaws in their design. The first involved their interpretation of the FastLane Check sequence. This is for when the Program Assistant enters the panelists' login information for the FastLane program. The 2011 team believed that the Program Support Staff entered panelist information into the FastLane database before sending panelist invitations. Therefore, their system first sent requests to the Support Staff to do this and only sent panelist invitation emails after the panelist information had been entered into FastLane. However, Program Specialist Marshall Horner informed us that panelists can only be entered into FastLane after they have been assigned to a panel. Therefore, we changed these workflows to send invitations once SharePoint access was granted to the panelists, and the system sends FastLane check requests to the Program Support Staff after reviewers were assigned to panels. The other

problem we noticed was that there was no email indicator of when a panelist received his finalized assignments. This could lead to a breakdown in communication, so we corrected it by adding another list field and a workflow step. During the set-up of these and other workflows, we encountered problems with limited access to SharePoint Designer because only DIS employees have permission to use it. This became problematic when other work within DIS took precedence over our project. We determined that if we had access, we could have further refined the SharePoint 2010 system.

Based on comments from EEC employees about other communication issues, we also realized that storing documents for panelists to read and reference on a SharePoint site could reduce the amount of paper used for panels and also allow the Program Directors to tailor the site to their specific needs. The documents sent out to panelists via email, such as the conflict of interest form, the hotel form, the summary of required actions, and briefing slides describing what a panel is and the different roles of panelists could be uploaded and stored on a SharePoint 2010 site. This would also allow for easier reference and management compared to sifting through emails from many panelists.

#### *4.2.2 Improvements for Program Directors*

Despite discrepancies in how Program Directors operate, our interviews with them allowed us to create the following general process diagram in Figure 4-4 of their interactions with panelists.

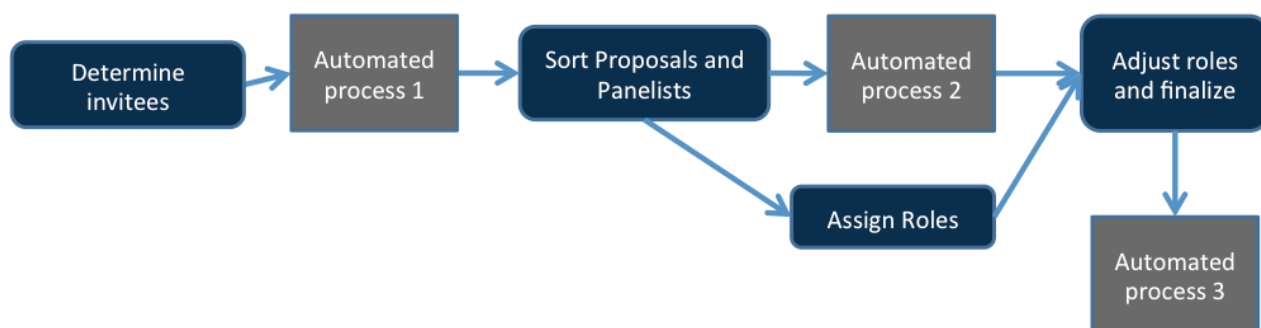


**Figure 4 - 4: Original workflow for the Program Directors**

Immediately, we identified tasks for automation shown in the magenta color. Specifically, we recognized that the subroutine of email reminders had the potential to waste a lot of the Program Director’s time. However, all the email correspondence had triggering events, such as deciding whom to invite or changing a panelist’s role, which SharePoint workflows could use to send emails on behalf of the Program Director. Having a computer complete these tasks for the Program Director eliminates steps from their process and ensures their completion, which helps to guarantee that the set up process remains on schedule. Of course, the chance for infinite loops of reminders remains as no system can force a human response, but with automation, it takes less time away from the Program Director.

Another issue with the panelist selection process is that some steps are performed out of order. Currently, Program Directors assign panelists roles before receiving their conflicts of interest. This causes an extra step in which they must change roles if a conflict of interest arises. This triggers more emails and more confirmations and reminders to panelists. By checking for conflicts of interest before finalizing roles, Program Directors could eliminate many unnecessary

steps. At this point in the process, panelists have limited information to establish their conflicts, but enough that their feedback can still be relevant to reduce the number of last minute changes, if not eliminate them. Furthermore, this process would be done using InfoPath forms and workflows, automating the process for the Program Director. While the panelists are indicating their conflicts, the Program Director could be assigning initial roles in parallel. By implementing these changes, we created an abbreviated process flow diagram for the Program Director as shown in Figure 4-5.



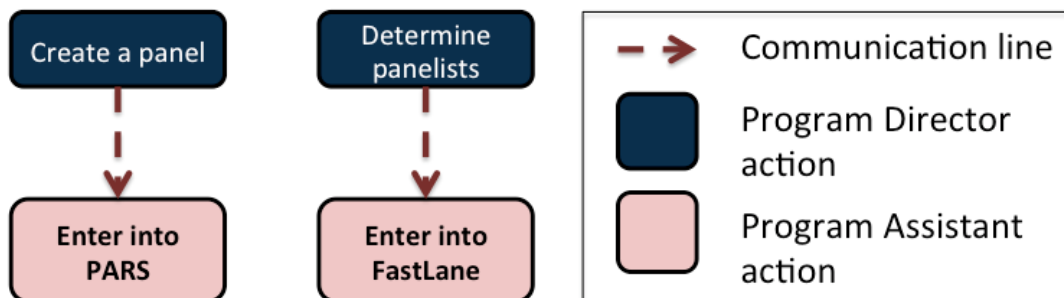
**Figure 4 - 5: New process diagram for the Program Director**

The main improvements are fewer steps, more efficient flow, and greater automation. The first automated process takes care of emailing the panelist invitees and sending them reminders to answer the invitation. The second informs them that the Program Director selected them for a panel and asks them to fill out their conflicts of interest. During this process, the Program Director can give them initial assignments, and once the panelists fill out their conflicts, the Program Director finalizes these assignments, prompting the third automated process that informs panelists of their assignments and asks them to accept them, sending reminders until they do. Further notifications will be sent if the Program Director makes additional changes.

#### 4.2.3 Improvements for Program Support Staff

The main concern our interviews with the Program Support Staff raised was communication with the Program Director. According to some Support Staff, some Program Directors do not provide the necessary information when creating a panel, may present it in an unintuitive fashion (such as a poorly formatted Excel spreadsheet), or the information they provide may not be correct. The SharePoint 2010 system inherently fixes the first two issues by uniformly displaying data and imposing requirements on certain data entry fields when creating new panels. By requiring fields such as “Expected Panelists” or “Start Date” and “End Date” to the list Program Directors use to create panels, the new system would ensure that the necessary information is present.

To even further ensure that this information is transferred correctly, we automated the panel creation communication lines shown in Figure 4-6.



**Figure 4 - 6: Program Director and Assistant communication**

After a Program Director finishes creating a panel in the SharePoint list, a workflow sends an email to the Program Support Staff with the necessary information to enter into PARS. It also automatically sends reminders to book a conference room for the panel meeting until either the Program Support staff or Program Director marks the task as complete. The other automated

task involves telling the Program Support staff which panelists to enter into the FastLane system. Certain fields such as personal address and panel ID are difficult to sort through manually, but by storing this information on the SharePoint site and then generating an email to the Program Support staff after the Program Director has assigned panelists to panels, the new system can condense all the relevant FastLane information into a single message per panelist. The system sends reminder emails with this information until the Program Support staff indicates the tasks completion. This way, employees finish their tasks more easily, and management can better check their progress.

To help correct misinformation that often occurs when relaying panelist information, the new system has panelists enter their own contact data wherever possible. Program Directors are still responsible for providing the initial contact information to open communication, but from there, the panelists can manage their own data and review tasks using InfoPath forms. The possibility for inaccuracies remains, but at a much lower level due to the personalized reporting.

### **4.3 Results from SharePoint 2010 Demonstrations**

In order to continue refining our system, we gathered feedback from EEC employees. By demonstrating the SharePoint 2010 system and its capabilities to different members of the division, we were able to see their reactions and obtain specific feedback. This feedback was the basis for additional changes and modifications we made to the SharePoint 2010 system.

#### *4.3.1 Demonstration with Dr. Cheville*

Our first demonstration was to our liaison and EEC Program Director, Dr. Alan Cheville. He raised three major concerns: information was still scattered, the entire system had to be more flexible, and the sidebar navigation menu was not intuitive. One thing he thought would be useful was a site feature showing the progress of each step of the panel set-up process and an

overview of all the panels. He wanted one central location where he could monitor tasks and analyze data. We agreed, as we were also having problems monitoring the site. This led to development of the Dashboard form in InfoPath shown in Figure 4-7 below. This form acts as a command center for information on every panel. It has a tasks overview page with separate task lists for the Program Support staff and the Program Director. Tasks are color-coded for completion, and beside each is a link to where the task can be completed or marked completed for easier navigation. Below these lists are panel overviews with information on its panelists and proposals.

Tasks/Overview	Panelist Status	Proposal Status	Admin Settings	<small>(Click to Navigate)</small>				Close						
<b>Program Assistant Tasks</b>														
Task	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Percentage								
Book Panel Room <a href="#">(Update // Mark Complete)</a>														
FastLane Check <a href="#">(Complete)</a>						80.000	%							
<b>Program Director Tasks</b>														
Task	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Percentage								
Invite Panelists <a href="#">(Invite // Mark Complete)</a>														
Assign Proposals to Panels <a href="#">(Assign to Panels)</a>						100.000	%							
Assign Panelists to Panels <a href="#">(Assign to Panels // Mark Complete)</a>														
Assign Roles on Proposals <a href="#">(Assign Roles // Mark Complete)</a>						43.750	%							
<b>Panel 1 Overview 11/14/2012</b>			<b>Panel 2 Overview 11/21/2012</b>				<b>Panel 3 Overview 11/21/2012</b>							
	Assignments Complete	Conflicts Marked	Conflicts Pending		Assignments Complete	Conflicts Marked	Conflicts Pending		Assignments Complete	Conflicts Marked	Conflicts Pending			
Panelists - 1	0	1	0	Panelists - 1	0	0	1	Panelists - 1	0	0	1			
	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized		Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized		Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized
Proposals - 1	1	0	8	0	Proposals - 2	1	1	2	1	Proposals - 1	0	0	0	1

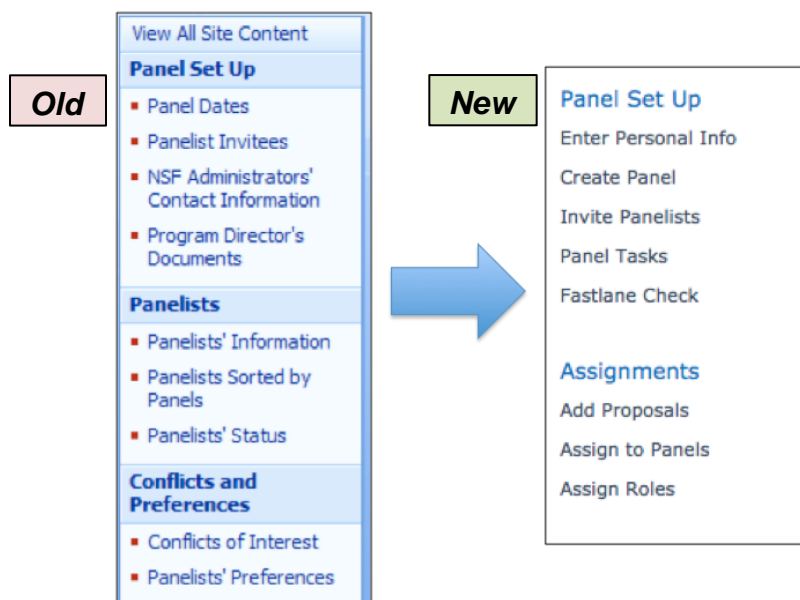
**Figure 4 - 7: Tasks/Overview section of the Dashboard form**

More in-depth information on panelists and proposals can be found in the Dashboard’s other pages, easily navigable by buttons on the top of the form.

The Dashboard also gives the user more flexibility. We added an “Administrator Options” tab that allows the user to make changes to reminder email settings and additional

customizations including allowing for ad hoc reviewers and disabling the “Prefer Not to Review” option for panelists when filling out the conflicts of interest form. Dr. Cheville also encouraged “stopping points” in the system, places where a Program Director could stop using the system while still taking advantage of its earlier steps. This did not require major changes, as each task was already fairly isolated. However, we made note to explain how to utilize these stopping points in our instructional documentation.

Dr. Cheville’s third concern was the site’s sidebar. Upon his suggestion and more consideration, we focused the sidebar redesign to follow the sequence and tasks displayed in Figure 4-8. The overall goal with this redesign was to follow Colborne’s (2008) design philosophy: simple but powerful. Sorting by information like the old system could be helpful, but after condensing and centralizing data in the Dashboard, it no longer made sense. Instead, we changed the wording on the sidebar to describe actions. For example, where an old navigation used to add proposals would say “Proposals,” we would change it to “Add Proposals.” This helped demonstrate each section’s purpose.

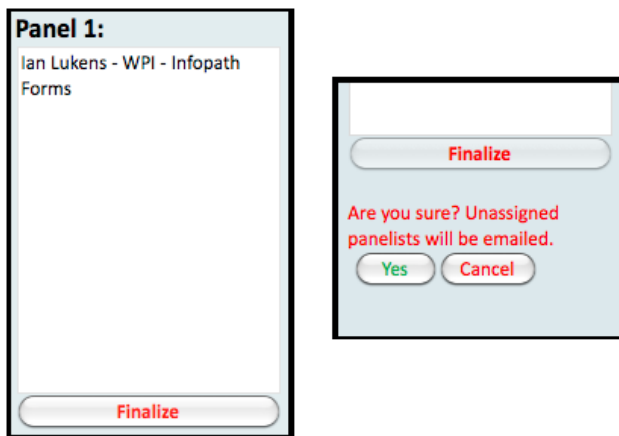


**Figure 4 - 8: Old and new navigation sidebars**



We also changed the subcategories to reflect tasks with separate steps. Similarly, we eliminated some of the navigation’s redundancy, as most of the information is now included in a link to the Dashboard in the top navigation bar.

Furthermore, Dr. Cheville informed us of another task not yet mentioned by the Program Directors. Upon finalizing all panelists to panel assignments, Program Directors have to email all the volunteers not selected. Previously done by hand, we decided we could automate these emails. We achieved this by adding a finalize button under each panel in the Panel Assign InfoPath form shown in Figure 4-9. Pressing these buttons prompted a workflow to change a new field in the Panel Dates list called “Panelists Finalized.” The same workflow that updates panelists when they are assigned to a panel would then check these fields on their available panels and send them the “Thank you, but all panels are full” email if they were not selected.



**Figure 4 - 9: Assign Panel InfoPath “finalize assignments” check**

#### 4.3.2 *Demonstration with Gwen Hardenbergh*

Our demonstration with the Program Support Manager Gwen Hardenbergh was structured similarly to the demonstration with Dr. Cheville but focused on the managerial side of the system. Specifically, she was concerned with auditing its data. Her primary suggestion was

that certain panel data ought to be archived. Information on number of proposals reviewed and panelists used should be collected for an end of the year report. We decided to create separate lists to fulfill this purpose, as the main panelist and proposal information would be erased to start new panels.

She mentioned that some Program Directors hold five panels at a time while our system could only handle three. This meant reworking all of our forms and editing our lists. InfoPath was not created for dynamic data such as changing numbers of panels and proposals, so editing forms to have an option of five panels took longer than we had expected. Inherently, the system has no scalability, or ability to automatically expand to include more panels, in this regard; the number of panels must be built in manually. As a result, the system can accommodate up to five panels controlled by one Program Director, but no higher.

She expressed further sidebar navigation suggestions but overall seemed satisfied with the site. We made note of many minor improvements she desired, but outside of the two previously mentioned additions, nothing major changed.

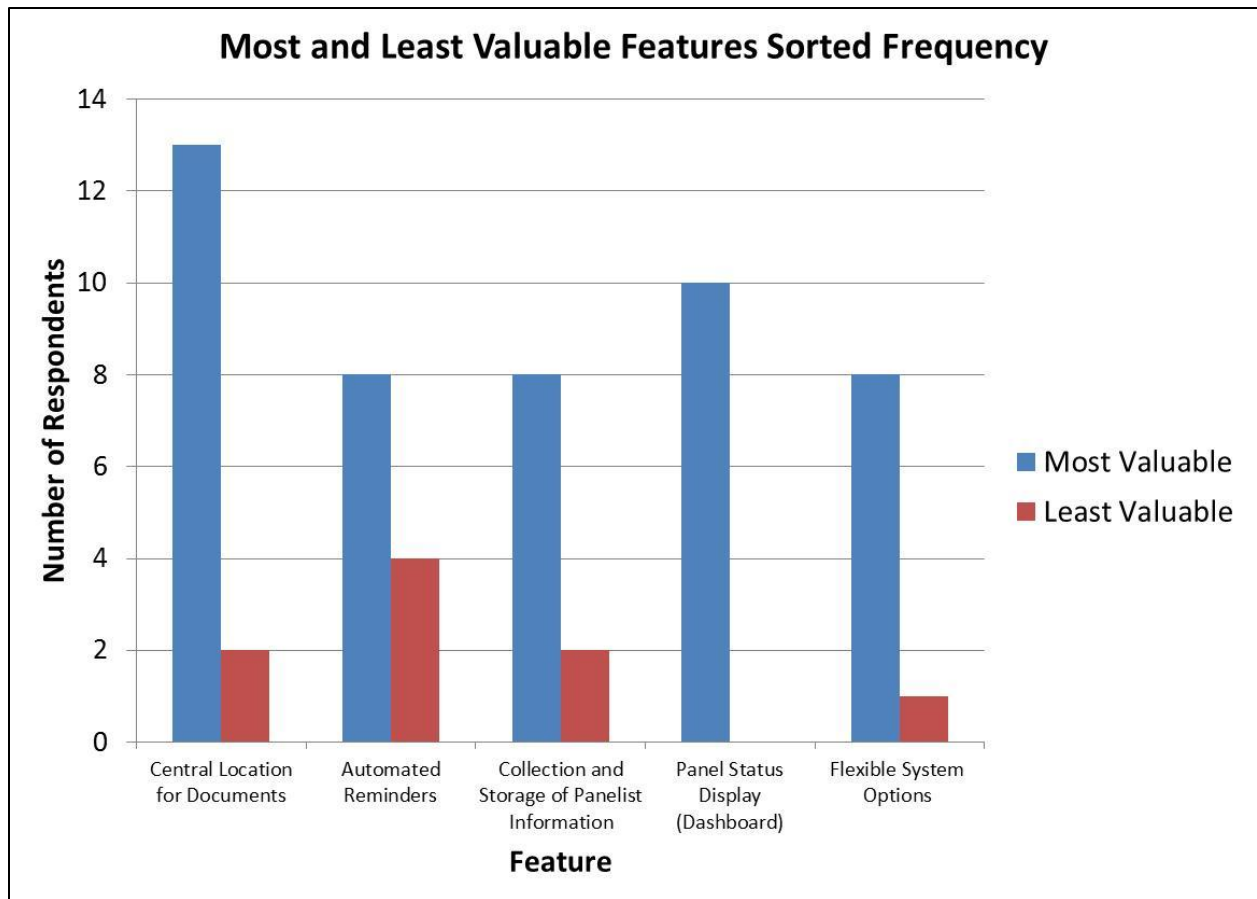
#### *4.3.3 Results of Staff Meeting Focus Group*

In order to display the full capabilities of our SharePoint 2010 panel selection process, we gave a demonstration to the EEC employees during one of their bi-weekly staff meetings. During the demonstration, we encouraged the seventeen employees present to ask questions about the steps that we were going through or about the system in general. For the most part, employees asked about how the panelists' privacy would be protected. We informed them that only the Program Directors and Program Assistants could see the full list of panelists. Panelists themselves would only be able to see their own information. The employees really seemed to like the dashboard that displayed the panel progress to date. The other comment that one

Program Director made was to make sure that each panelist was only assigned to one role per proposal. One additional feature that was mentioned during the open discussion was a need for a variable number of reviewers per proposal. At the time, our system had a set number of reviewers as four per proposal, but the Engineering Research Center division sometimes needs up to ten reviewers per proposal. Finally, the employees were very interested in having SharePoint communicate with other databases at the NSF. We understood that this could be very helpful but is outside of the scope of our project, and suggested that they work with DIS to figure out if communicating between databases with SharePoint were possible. Overall, the demonstration and focus group went very well. The demonstration worked well without technical problems, and the features and capabilities of the SharePoint system were easily understood by the employees. In addition to the focus group, we distributed surveys (compiled in Appendix G) to the demonstration attendees. The open discussion and surveys provided detailed feedback from the prospective EEC users of the SharePoint 2010 system.

The survey results that we gathered provided feedback about the most and least valued features of our SharePoint 2010 system, the likelihood that employees would use our system, the preferred training methods for learning new software, and general comments on what else SharePoint could be used for in the EEC.

According to the fifteen surveys we collected, the most valued features of the SharePoint system we developed are the central location for documents and the panel status displayed by the Dashboard (Figure 4-10). The least valued feature was automated reminders, as shown in Figure 4-10.

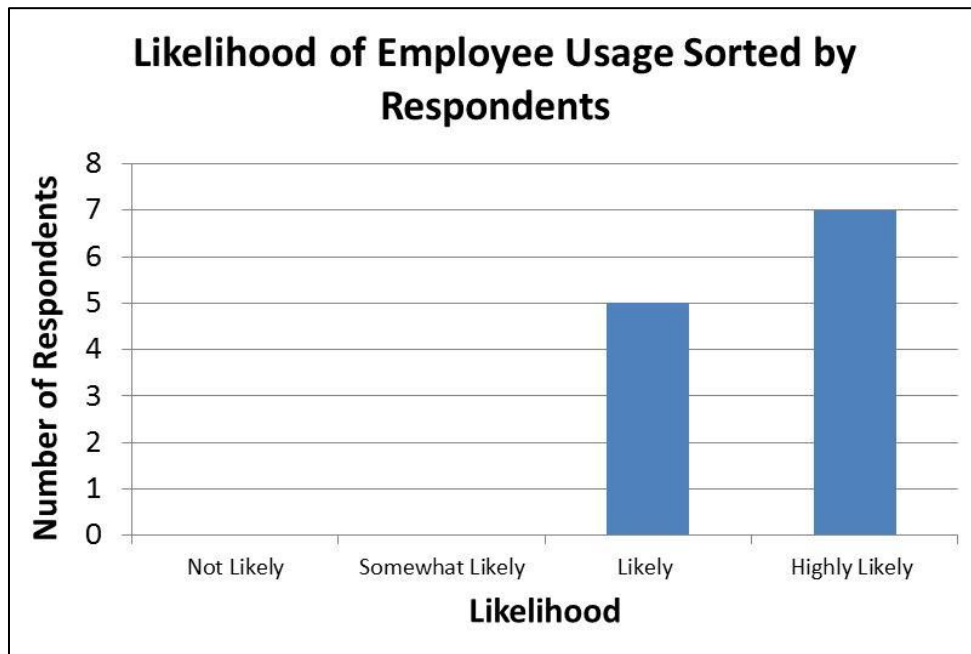


**Figure 4 - 10: Chart of the Most and Least Valuable Features of the SharePoint 2010 System**

The results of the survey heavily favored central location of documents, but some surveys circled this particular feature for both the most and least valued feature. Therefore, the central location for documents was counted for both on some surveys. Also, there were a number of surveys that listed what the most valued feature of the system was but not the least valued. Overall, a majority of the participants marked more positive features than negative. Most of the participants liked the improvements to the SharePoint 2010 panel selection process that we had made.

The next subject that we analyzed was the employees' willingness to use the system. We based their willingness on their answers to the question of how confident they are that they would be able to use this system. The possible answers ranged from 1 to 4: 1 being not likely, 2

being somewhat likely, 3 being likely, and 4 being highly likely. These results were compiled into the chart shown in Figure 4-11.



**Figure 4 - 11: Chart of Likelihood of Employee’s ability to use the SharePoint 2010 System**

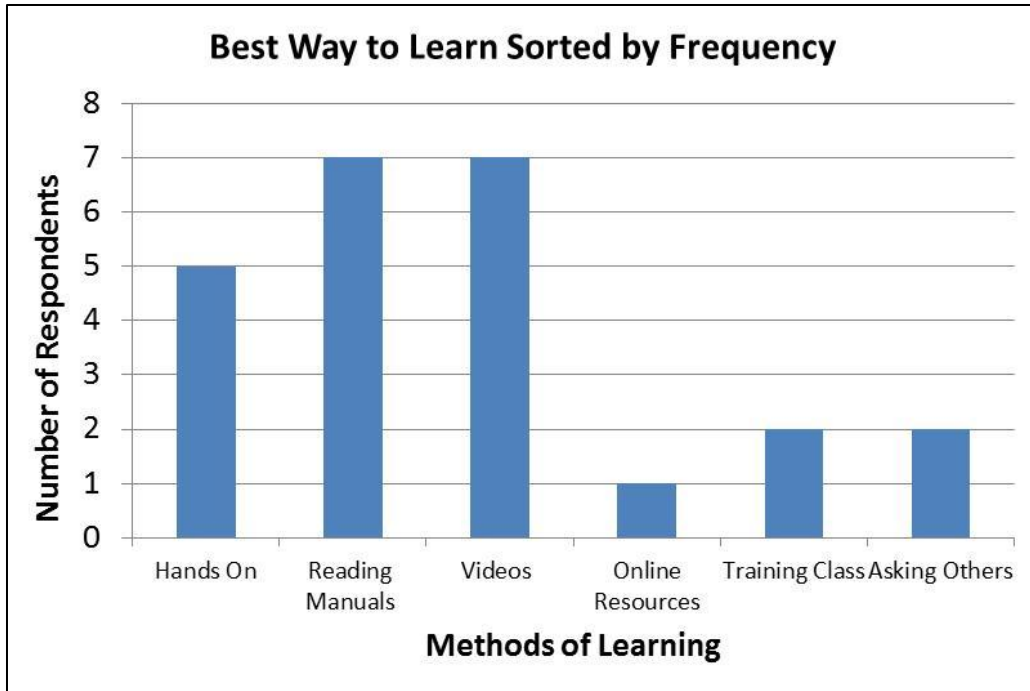
From the answers we received, one hundred percent of employees were likely or highly likely to use the system. These results mean that our SharePoint 2010 system was explained well and the capabilities of the system are easy to understand. The easier the features are to understand, the higher the likelihood that the system will be implemented in the division.

In conclusion, the demonstration went very well and we received a lot of information and feedback. The features associated with our system were well received; in particular many employees believed that the SharePoint site appeared easy to use. General comments about the demonstration and how SharePoint could be used for other tasks included having a reviewer information storage database to include reviewer expertise, contact information, having a master spreadsheet with all the panelist information (the type of panel they served, the number of times

they served on panels) compiled for the annual report, using SharePoint for ERC site visit report writing, and using SharePoint for employee travel documentation. We were able to use the responses from the surveys to gather information about the system and employee learning preferences. We used the results about the preferred learning methods to create and refine training manuals to accompany the system.

#### **4.4 Creation and Refinement of Training Modules**

During our development of the SharePoint 2010 panel selection system, we recognized the need for training modules. The system is complex, and including training material would increase the likelihood that the employees will use the system. The first factor that we wanted to determine was what kind of training modules we should produce. To answer this question, we analyzed the feedback we received from our focus group and discovered a tie for first place between reading manuals and viewing videos as shown in Figure 4-12. To cater to the largest amount of employees, we settled on deploying a combination of both manuals and videos, which were uploaded onto the external SharePoint site.



**Figure 4 - 12: Chart of the Most Common Methods Employee’s Use to Learn**

There were several factors that influenced the style of training modules developed. The primary factor was time; according to Dr. Kenny, many employees in the EEC division felt they could not set aside more than an hour to learn material. The second factor was knowledge of SharePoint; EEC employees have varying degrees of familiarity with SharePoint. The final factor was that the training manuals from the 2011 project went into far too much detail; this made the training material tedious to read. Keeping the above points in mind, we opted to create both training manuals and short training videos (Appendix H).

The goal of the training modules was to have each step of the written explanations represent a specific, expected action while using the SharePoint panel selection process. Each module was created in this manner so that employees could skim the table of contents and quickly search for only sections that they needed at the time. We deemed this important because the panel selection process spans six months with only a step or two occurring at one time,

followed by a significant gap. The steps in the training modules were arranged in chronological order mimicking the current panel selection process to make the adoption of the new process easier. The training modules were created with the assumption that the audience had minimal familiarity with SharePoint; however, to offset the tediousness that more experienced users complained about, several of the overly detailed steps in the 2011 manuals were skipped or reworked. The training materials were further divided up into roles of Program Director, Program Assistant, and panelist. This separation helped us to focus on the unique tasks of each role. It also made managing updates to each manual easier. We created the videos similarly by making a video for each task instead of one video for the entire process. During a training sessions, a Program Director and Program Assistant responded well to the training materials developed. Overall, they liked the training material and found it straightforward with only a few comments on confusing wording.

#### **4.5 System Documentation**

In addition to the training modules we created, we also made supplementary documents to describe the proper creation and use of the system. As Vilkomir and Parnas (2007) state, software is difficult to test and trust but good documentation can bridge these gaps. One document we created was a testing protocol. It was structured to ensure all major elements of the system were tested. The second piece of documentation we produced was a developer's manual. We based our developer's manual off of the one created for the 2011 WPI project as we found its information very helpful although incomplete. The manual we created this year included all of the information from last year's manual: lists, workflows associated with lists, and groups. It was expanded to include workflow pseudo-code, permissions on each list, and a detailed write up on each field that the forms included. Due to its technical nature, it has been omitted from the



report. All of the additional system documentation was created to ease the process of transitioning to the new SharePoint panel selection process and help maintain the system sustainability in future use. These documents will provide assistance to anyone looking to use or recreate the SharePoint system we have provided.

#### **4.6 Summary**

Using our knowledge of the EEC division, workflow systems, and the capabilities of SharePoint 2010, InfoPath, and SharePoint Designer, we created a workflow system for the EEC division that should increase their efficiency during the panel selection process. We concentrated on finding areas for automation and information management that could be handled through technology. By automating processes such as emails, we eliminated steps for the Program Director, which ensured their completion and improved communication. By creating centralized information management, we facilitated easy communication between the Program Director and his/her Assistant and lowered the possibility for misinformation. This also allowed us to create knowledge-management and decision support systems that provided Program Directors, Assistants, and panelists with necessary or helpful information when making decisions and completing tasks. With these developments, we established a system that would streamline the workflow of Program Directors and their assistants, improve the ease of their decisions, and prevent miscommunication between Program Directors, Program Assistants, and panelists. We presented the system to the employees and received overall positive responses. Additionally, we left appropriately detailed documentation on all aspects of the system for the NSF DIS and training material for the EEC employees to enable its continued use within the organization.

## **5 Conclusions and Recommendations**

After developing a SharePoint 2010 system for the panel selection process, we developed recommendations for the EEC division on how they can improve upon the work we have done. Our main conclusions were drawn from the data gathered from our interviews with the staff members, the information and suggestions received after the staff demonstration, and the remarks made in the mock panel. From these conclusions, we were able to develop recommendations for the EEC division that could further increase the efficiency of the panel selection process. This chapter discusses our major conclusions drawn from Chapter 4 and our recommendations.

### **5.1 Conclusions**

Based on the results of our research, we have concluded that the EEC staff would highly value a semi-automated workflow management system such as our proposed SharePoint 2010 system. Following feedback from our staff demonstration, we concluded that the staff would highly value most of the features that our system offers, in particular the dashboard displaying the panel summary and the central location for documents. Also, the optimism of the staff during the focus group helped us conclude that there is a strong possibility of our proposed SharePoint site being implemented within the division for individual program's needs. If the division does decide to adopt the system, we have completed training materials (manual's and videos) as well as supplementary documents that would make the transition easier and make the system sustainable. In addition, working closer with the DIS division could help EEC employees incorporate more of their daily responsibilities and panel processes into the SharePoint 2010 system. Also, better integration with other databases could enable SharePoint to automate more

tasks. Finally, if the EEC division chooses to implement the SharePoint 2010 panel selection process that we have created, we expect the decision will save time and resources. Aside from these conclusions, we have provided recommendations to the division that we believe will further increase efficiency.

## 5.2 Recommendations

After reviewing the data we gathered, analyzing the trends and common topics that arose in the different interviews and demonstrations, and discussing our observations, we developed the following recommendations for the NSF-EEC division:

- Use SharePoint 2010 system for panel selection process
- Hold training sessions to learn the system
- Consider future research

We have elaborated on each of these suggestions in the following sections.

### 5.2.1 *Use SharePoint 2010 for the panel selection process*

- **We recommend that the EEC division adopt the SharePoint 2010 system we developed to manage the panel selection process.** The interviews we conducted indicated this would result in a decreased number of emails, better organization, and decreased time on tasks.
- **We recommend that the EEC continually collects feedback on the system to refine it so it fits the changing needs of the division.** By doing this, the EEC division may be able to expand upon the current features of the system.
- **We recommend the Administrative InfoPath forms be redeveloped in a more suitable platform for easier scalability and updating.**

### 5.2.2 *Hold Training Sessions to learn system*

- **We recommend that the EEC division use our training manuals and develop further training material as the system improves.** Our materials only cover the current features of the system. If processes change or features are added, employees will require additional training.
- **We suggest that the EEC division work with the Instructional Technology Office of the NSF to hold training sessions where employees can go through basic tasks to learn how to effectively use the SharePoint 2010 system.** Employees indicated that they learn best “by-doing” or “hands on.” Due to time limitations we were unable to teach the employees how to use the system ourselves through a mock panel, but a training session would be very valuable.

### 5.2.3 *Future Research*

- **We recommend that the EEC investigate the panelist archive option.** Due to time limitations, we were unable to fully investigate the legal restrictions regarding the amount of information that can be stored on each panelist. However, storing the number of times a panelist has been a reviewer and the topics the panelist has been a reviewer for can help with the managerial annual reports.
- **We recommend that the EEC further automate panelist’s travel plans using SharePoint 2010.** These automations would involve complicated workflow but would make communication and planning between Program Assistant and panelist easier.
- **We recommend gathering more feedback from the Program Directors who actually use the system.** The feedback that we gathered was just from interviews prior to the

implementation of the system. The hands-on training along with actual use of the system would generate better feedback since we may have overlooked problems.

### **5.3 Summary**

We propose the implementation of the SharePoint 2010 system in the EEC division. Our reevaluation and improvements to the 2011 WPI SharePoint system significantly increases compatibility with the EEC division's workflow needs. The EEC employees can benefit from having many of their responsibilities automated with built-in reminders to ensure that panels are scheduled on time and with fewer mistakes. Using the SharePoint 2010 system could help Program Directors and Program Assistants to get more accurate information from panelists and keep the panel selection process more organized. Many Program Directors plan multiple panels at one time, and using the dashboard on the SharePoint 2010 site will let Program Directors track the status of each panel. The system also allows for different levels of usage; the system is designed so that a Program Director can stop using it at different points, so they can take the information the system has helped them to collect and apply it to the method they currently use. If our proposed SharePoint 2010 panel selection process is adopted, the NSF-EEC division could save valuable time and resources when setting up panels.

## References

- Aalst, W. v. d., & Hee, K. v. (2004). *Workflow management: Models, methods, and systems*. Boston: MIT Press. Retrieved from [http://books.google.com.ezproxy.wpi.edu/books?hl=en&lr=&id=O1xW1\\_Za-I0C&oi=fnd&pg=PR16&dq=workflow&ots=I8bv65AIVN&sig=6u4BUxZGmnWKcpGvGGkncy5zxWM](http://books.google.com.ezproxy.wpi.edu/books?hl=en&lr=&id=O1xW1_Za-I0C&oi=fnd&pg=PR16&dq=workflow&ots=I8bv65AIVN&sig=6u4BUxZGmnWKcpGvGGkncy5zxWM)
- American Psychological Association. (2012). Foundation grants. In *What We Fund*. Retrieved from <http://www.apa.org/apf/funding/grants/index.aspx>
- Bluffton University. (2012). *Methods of Empirical Research*. [Presentation slides]. Retrieved from [www.bluffton.edu/courses/tlc/nathp/.../methodsofempiricalresearch.ppt](http://www.bluffton.edu/courses/tlc/nathp/.../methodsofempiricalresearch.ppt)
- Callahan, A. (2008). Site collections and web applications. Retrieved from [http://msdn.microsoft.com/en-us/library/dd576268\(v=office.12\).aspx](http://msdn.microsoft.com/en-us/library/dd576268(v=office.12).aspx)
- Centre for Learning & Performance Technologies. (2011). Top 100 tools for learning. Retrieved from <http://c4lpt.co.uk/top-100-tools-for-learning-2011/>
- Chaffey, D. (1998). *Groupware, workflow, and intranets : Reengineering the enterprise with collaborative software*. Newton: Digital Press. Retrieved from <http://au4sb9ax7m.search.serialssolutions.com/log?L=AU4SB9AX7M&D=WZT&P=Link&U=http%3A%2F%2Fpzproxy.wpi.edu%2Flogin%3Furl%3Dhttp%3A%2F%2Flibrary.books24x7.com%2F>
- Coffey, H. (2009). Demonstrations in the Classroom. In *Demonstration*. Retrieved from <http://www.learnnc.org/lp/pages/5181>
- Colborne, G. (2010). *Simple and usable web, mobile, and interaction design*. New Riders Publishing. Retrieved from <http://proquest.safaribooksonline.com.ezproxy.wpi.edu/book/web-design-and-development/9780321714138>
- Davidson, J., Moore, B., & Ruck, S. (2010). *Management Through Digital Collaboration -- An Exploration of Microsoft SharePoint Usage at the USPTO*. (Undergraduate Interactive Qualifying Project No. E-project -121610-011757). Retrieved from Worcester Polytechnic Institute Electronic Projects Collection: <http://www.wpi.edu/Pubs/E-project/Available/E-project-121610-011757/>
- Dávila, I., Davis, N., Rodríguez, W., & Zivras, E. (2012). *Workflow at NSF*. (Undergraduate Interactive Qualifying Project No. E-project-011212-184714). Retrieved from Worcester Polytechnic Institute Electronic Projects Collection: <http://www.wpi.edu/Pubs/E-project/Available/E-project-011212-184714/>

- DeWalt, B. & DeWalt, K. (2002). *Participant Observation: A Guide for Fieldworkers*. Retrieved from <http://books.google.co.uk/books?id=p1wcO3UNXQ4C&printsec=frontcover#v=onepage&q&f=false>
- eWeek.com. (2009). Enterprise Applications: 10 Collaboration Platforms to Consider for Your Business. In *Enterprise Applications News & Reviews*. Retrieved from <http://www.eweek.com/c/a/Enterprise-Applications/10-Collaboration-Platforms-To-Consider-For-Your-Business-884210/>
- Georgakopoulos, D., Hornick, M., & Sheth, A. (1995). *An overview of workflow management: From process modeling to workflow automation infrastructure*. Dordrecht: Springer Netherlands. doi: 10.1007/BF01277643
- Gorman, M. E. (2011). Doing science, technology and society in the National Science Foundation. Commentary on: "engaged, embedded, enjoined: Science and technology studies in the National Science Foundation". *Science and Engineering Ethics*, 17(4), 839-849. doi: 10.1007/s11948-011-9308-9
- Harbridge, R. (2012). *SharePoint 2007 vs SharePoint 2010 comparison*. Retrieved from [http://www.rharbridge.com/?page\\_id=103](http://www.rharbridge.com/?page_id=103)
- L&T Infotech. (2012). IT services firm increases business agility and employee productivity with enterprise. Retrieved from <http://www.microsoft.com/casestudies/ServeFileResource.aspx?4000028141>
- Lapointe, Liette, & Rivard, Suzanne. (2005). A Multilevel Model of Resistance to Information Technology Implementation. *MIS Quarterly*, 21(3), 461-491.
- Lavenda, D. (2011, November). 7 facts about social business and collaboration platforms. *Fast Company*. Retrieved from <http://www.fastcompany.com/1792684/7-facts-about-social-business-and-collaboration-platforms>
- McKenna, E., Laahs, K., & Veli-Matti V. (2010). *SharePoint 2010 All-in-One for Dummies*. Retrieved from library.books24x7.com.wpi.edu/toc.aspx?bookid=40807
- Microsoft. (2012a). *Microsoft case study: Microsoft SharePoint server 2010 - United States Department of Agriculture*. Retrieved from [http://www.microsoft.com/casestudies/Case\\_Study\\_Detail.aspx?CaseStudyID=4000009950](http://www.microsoft.com/casestudies/Case_Study_Detail.aspx?CaseStudyID=4000009950)
- Microsoft. (2012b). *Microsoft InfoPath 2010*. Retrieved from [http://www.microsoftstore.com/store/msstore/pd/productID.216500500?WT.mc\\_id=pointitem\\_US\\_Google\\_5-InfoPath\\_generic&wt.term=infopath%202007&wt.campaign=\\*5+-InfoPath&wt.content=Ju8fo8bT&wt.source=google&wt.medium=cpc&WT.srch=1](http://www.microsoftstore.com/store/msstore/pd/productID.216500500?WT.mc_id=pointitem_US_Google_5-InfoPath_generic&wt.term=infopath%202007&wt.campaign=*5+-InfoPath&wt.content=Ju8fo8bT&wt.source=google&wt.medium=cpc&WT.srch=1)

- Microsoft. (2012c). *Microsoft SharePoint Designer 2010*. Retrieved from <http://sharepoint.microsoft.com/en-us/product/related-technologies/pages/sharepoint-designer.aspx>
- Microsoft. (2012d). *Microsoft SharePoint 2010 IT Professional Evaluation Guide*. Retrieved from <http://www.microsoft.com/en-us/download/details.aspx?id=23405>
- Microsoft Office. (2012a). *Managing SharePoint Designer 2010*. Retrieved from <http://office.microsoft.com/en-us/sharepoint-designer-help/managing-sharepoint-designer-2010-HA101838275.aspx>
- Microsoft Office. (2012b). Support. In *Synchronize SharePoint 2010 content with Outlook 2010*. Retrieved from [http://office.microsoft.com/en-us/sharepoint-foundation-help/synchronize-sharepoint-2010-content-with-outlook-2010-HA101881295.aspx#\\_Toc262734693](http://office.microsoft.com/en-us/sharepoint-foundation-help/synchronize-sharepoint-2010-content-with-outlook-2010-HA101881295.aspx#_Toc262734693)
- Microsoft Office SharePoint Designer 2010. (2012). *Toolbar Screen Shot*. Retrieved from SharePoint Designer running on Windows 7
- Microsoft SharePoint 2010. (2012). *Ribbon Screen Shot*. Retrieved from <https://sharepoint.wpi.edu/iqp/nsfiqp/layouts/settings.aspx>
- National Institutes of Health. (2012). Peer review process. In *Grants*. Retrieved from [http://grants.nih.gov/grants/peer\\_review\\_process.htm#Initial](http://grants.nih.gov/grants/peer_review_process.htm#Initial)
- National Science Foundation. (2011a). About NSF. In *NSF Congressional Highlight: FY 2012 appropriations signed into law--NSF to receive \$7.033 billion*. Retrieved from [http://nsf.gov/about/congress/112/highlights/cu11\\_1118.jsp](http://nsf.gov/about/congress/112/highlights/cu11_1118.jsp)
- National Science Foundation. (2011b). *Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years(FY) 2011-2016*. Retrieved from National Science Foundation, Arlington, Virginia website: [http://www.nsf.gov/news/strategicplan/nsfstrategicplan\\_2011\\_2016.pdf](http://www.nsf.gov/news/strategicplan/nsfstrategicplan_2011_2016.pdf)
- National Science Foundation. (2011c). Grant Proposal Guide. In *Chapter III – NSF Proposal Processing and Review*. Retrieved from [http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg\\_3.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_3.jsp)
- National Science Foundation. (2012a). About NSF. In *How We Work*. Retrieved from <http://www.nsf.gov/about/how.jsp>
- National Science Foundation. (2012b). About NSF. In *NSF at a glance* .Retrieved from <http://www.nsf.gov/about/glance.jsp>



- National Science Foundation. (2012c). About NSF. In *Staff Directory: R. Alan Cheville*. Retrieved from [http://www.nsf.gov/staff/staff\\_bio.jsp?lan=rchevill&org=NSF&from\\_org=NSF](http://www.nsf.gov/staff/staff_bio.jsp?lan=rchevill&org=NSF&from_org=NSF)
- National Science Foundation. (2012d). About NSF. In *What we do*. Retrieved from <http://www.nsf.gov/about/what.jsp>
- National Science Foundation. (2012e). About NSF. In *Who we are*. Retrieved from <http://www.nsf.gov/about/who.jsp>
- National Science Foundation. (2012f). Biological Sciences. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization.jsp?org=BIO](http://www.nsf.gov/awards/award_visualization.jsp?org=BIO)
- National Science Foundation. (2012g). Computer and Information Science and Engineering. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization\\_noscript.jsp?org=CISE](http://www.nsf.gov/awards/award_visualization_noscript.jsp?org=CISE)
- National Science Foundation. (2012h). Education and Human Resources. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization\\_noscript.jsp?org=EHR](http://www.nsf.gov/awards/award_visualization_noscript.jsp?org=EHR)
- National Science Foundation. (2012i). Engineering. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization.jsp?org=ENG#](http://www.nsf.gov/awards/award_visualization.jsp?org=ENG#)
- National Science Foundation. (2012j). GeoSciences. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization\\_noscript.jsp?org=GEO](http://www.nsf.gov/awards/award_visualization_noscript.jsp?org=GEO)
- National Science Foundation. (2012k). History. In *Publications: National Science Foundation Act of 1950*. Retrieved from <http://nsf.gov/about/history/legislation.pdf>
- National Science Foundation. (2012l). Mathematical and Physical Sciences. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization.jsp?org=MPS](http://www.nsf.gov/awards/award_visualization.jsp?org=MPS)
- National Science Foundation. (2012m). Social, Behavioral, and Economic Sciences. In *Awards*. Retrieved from [http://www.nsf.gov/awards/award\\_visualization\\_noscript.jsp?org=SBE](http://www.nsf.gov/awards/award_visualization_noscript.jsp?org=SBE)
- National Science Foundation. (2012n). Staff Directory by Organization. In *Division of Engineering Education & Centers*. Retrieved from <https://inside.nsf.gov/aboutnsf/staffdirectory/Pages/StaffSearch.aspx?BySpOrg=1&OrgId=27&OrgType=DIVISION&Expand=Y>
- National Science Foundation. (2012o). Web Policies and Important Links. In *Use of NSF Logos*. Retrieved from [http://www.nsf.gov/policies/logo\\_use.jsp](http://www.nsf.gov/policies/logo_use.jsp)
- Purdue University Cooperative Extension. (2001). Giving a Demonstration. In *Training Curriculum*. Retrieved from <http://www.nal.usda.gov/foodstamp/pdf/givedemo.PDF>

- Rauterberg, G. (2012). Direct Observation. In *User Fit Tools and Techniques*. Retrieved from <http://www.idemployee.id.tue.nl/g.w.m.rauterberg/lecturenotes/UFTdirectobservation.pdf>
- Rockefeller Foundation. (2012a). About Us. In *Careers*. Retrieved from <http://www.rockefellerfoundation.org/about-us/careers/open-position-assistant>
- Rockefeller Foundation. (2012b). About Us. In *Our Team*. Retrieved from <http://www.rockefellerfoundation.org/about-us/our-team>
- Rockefeller Foundation. (2012c). About Us. In *Pamela O. Foster*. Retrieved from <http://www.rockefellerfoundation.org/about-us/our-team/pamela-o-foster>
- Rockefeller Foundation. (2012d). Grants & Grantees. In *What We Fund*. Retrieved from <http://www.rockefellerfoundation.org/grants/what-we-fund>
- Rockefeller Foundation. (2012e). Who We Are. In *Our Strategy*. Retrieved from <http://www.rockefellerfoundation.org/who-we-are/our-strategy>
- Sharp, A., & McDermott, P. (2008). *Workflow modeling : Tools for process improvement and applications development (2nd edition)*. Norwood, MA: Artech House.
- Turner Foundation. (2012). Our Grants. Retrieved from <http://www.turnerfoundation.org/>
- Vilokmir, S., & Parnas, D. (2007). Precise documentation of critical software. *IEEE Computer Society*, Retrieved from <http://ulir.ul.ie/handle/10344/357>
- Wellcome Trust. (2012). Grant decision-making process. In *Funding*. Retrieved from <http://www.wellcome.ac.uk/Funding/Biomedical-science/Application-information/WTD004051.htm>
- Wilson, Tom. (2012). *Structure in Research Methods*. [Presentation slides]. Retrieved from <http://informationr.net/tdw/publ/ppt/ResMethods/sld001.htm>

# Appendices

## Appendix A: Interview with DIS Employee

### Interview Protocol

Good Afternoon (or Morning). We are the Worcester Polytechnic Institute project team, Ian Lukens, Chris McAndrews, Emily Miner, and Victoria Stratton, working for Dr. Cheville. Our project is to improve the efficiency of the panel selection process in the EEC division using SharePoint 2010. We would be very appreciative if you could spare time to answer our questions.

1. How many different systems for storing data are used at the NSF? How many of these systems could benefit from integration with SharePoint 2010?
2. Is our SharePoint site able to access databases that contain either proposal information, panel information, or invitee information?
3. What are your information data and security policies?
  - a. Process for adding people to the site-is a fast turnaround?
4. What are the best ways to update multiple items in a SharePoint list via form?
  - a. We thought about using CAML queries. What are your thoughts?
5. Please describe limitations in software that we can use? (i.e. SharePoint designer, scripts)
6. Is InfoPath the best program to use for updating list items in SharePoint?
  - a. If not, any suggestions for better programs?

## Summary of Interview with DIS Employee

*Thursday, November 1, 2012*

We met with an employee from the Division of Information Systems. Last year, they worked with the WPI project team to help create the first version of the SharePoint workflow system that helped to set up panels within the EEC division. Following the departure of last year's WPI team, they continued to work on the forms to include more information. The forms from last year were all in working order when they were finished for SharePoint 2007, however due to the migration to SharePoint 2010 there were several breakages in the links. We explained that the workflows in place on the SharePoint 2010 version were ending in errors. The DIS employee said that they would look into getting our group access to SharePoint Designer so that we could correct these ourselves. Another method of updating multiple items in a SharePoint list via form is to promote columns, but this method only works one at a time. At a later date, we learned that we would not be granted permission to SharePoint Designer as it was against DIS policy.

The DIS employee suggested not using CAML queries because we want to stay away from writing code outside of JavaScript. Anything done in code requires getting the code approved which is more of a hassle. After hearing about workflows we asked how many systems the NFS uses relating to the panel selection process and if we could automate data collection from any of them using SharePoint 2010. The DIS employee mentioned that they were unsure of how many different systems there are, but it was irrelevant as not all systems have been migrated which prevents them from being queried.

We asked about updating multiple list items and if InfoPath was the correct program to use. The DIS employee suggested that we use workflows to update all of the list items as it was the most straightforward method that did not require code. They mentioned that this should be done in bulk loads if possible, because the servers that host the SharePoint websites are rather weak so many small requests could overwhelm it and delay service. One suggestion the DIS employee had to improve the usability of the SharePoint website was to tear down all of the old pages and set up new ones in their place.

## **Appendix B: Program Director Interviews**

### Interview Protocol

Good Afternoon (or Morning). We are the Worcester Polytechnic Institute project team, Ian Lukens, Chris McAndrews, Emily Miner, and Victoria Stratton, working for Dr. Cheville. Our project is to improve the efficiency of the panel selection process in the EEC division using SharePoint 2010. We would be very appreciative if you could spare time to answer our questions.

1. Please give a brief overview of your method for the panel selection process.
2. Which steps of the process are the most time-consuming? Why?
  - a. What is the time range for each step?
3. What works well in the current process?
4. Ideally, how would you improve the process?
5. How are panelist data collected and stored?
6. How comfortable/experienced are you with SharePoint 2007 and/or 2010.

How would you feel about learning a new way to complete your job, such as using SharePoint 2010?

## Summary of Program Director Interview with Carole Read

*Thursday, November 1, 2012*

Carole Read is a Program Director for the Engineering Research Center (ERC) program within the EEC. We interviewed her to learn about how she sets up panels to help refine our SharePoint 2010 system. Read holds panels every 1-1.5 years, but it depends on appropriations. Her last panel was in July 2012 and she had one week to set up the panel. She got recommendations for reviewers to invite from other Program Directors within the EEC. She then phoned and emailed the potential reviewers to see if they would participate in the panel she was planning. She compiled a list of replies and would plan the panel from there.

Read mentioned that she preferred the telephone and email as a better way of contacting panelists because there is human contact. She is not in favor of SharePoint as it does not fit her personal system for staying organized.

The ERC uses SharePoint for:

- holding resumes of potential employees (replacements for Dr. Cheville)
- document storage

*Read's suggestions for improvement of panel selection system:*

Read suggested that we create a database of panelists that have served as reviewers for EEC panels with all their information (expertise, institution, keywords, past panels, etc.) for easier searching in the future. We mentioned the Proposal and Reviewer system or PARs, which has those functions, but she did not exhibit an awareness or knowledge of the program. She also encouraged checking the firewalls in place to avoid problems with privacy within the internal NSF site. We mentioned that the site we are creating is an external site and she was unaware that there are both internal and external sites.

## Summary of Program Director Interview with Dr. Barbara Kenny

*Thursday, November 1, 2012*

### *Summary:*

Dr. Kenny works in the Engineering Research Center program and only holds panels occasionally because they are more expensive despite being shorter in length. They receive about 100 proposals each accepting period and group them into 8-9 categories by topic areas and start to plan a panel for each topic. Each Program Director in the ERC program is assigned 1-2 panels to set up. Once assigned, Dr. Kenny starts to find panelists with the right expertise to review for those specific panels. She uses her personal contacts list first and using the conflicts of interest (COI) manual, decides whether a person is a good fit to review on that panel. She won't invite a person to a panel unless they clear the COI test first.

She will send out an email to the reviewers she wants and waits to hear back before inviting the next. When she hears back from a person she documents it in an Excel spreadsheet and gives that filled spreadsheet with all the future panelist names to her Program Support staff member, Marshall Horner. The Program Director makes a matrix and assigns the panelists to proposals based on their expertise and the topic of the proposals. The Program Support staff organizes the 2-day panel using information from the Proposals and Reviewer system (PARs). PARs is a panelist database (not well known in the division) that stores all information on previous panelists. The Program Support staff handle all the logistics of the panel.

For the ERC program, the process takes about 1-2 weeks as the process is very short. They try to get a diverse panel but sometimes they just cannot meet the guidelines for diversity. There is a "50-70% hit rate of how many people say yes on the first try". Finding enough reviewers for a panel is the most time-consuming process.

### *Dr. Kenny's suggestions for improvement of panel selection system:*

- Increased privacy for the reviewers
- Equaling out the number of lead proposals/scribe proposals for each reviewer
- Equaling out the number of proposals per reviewer

## Summary of Program Director Interview with Deborah Jackson

*Tuesday, November 6, 2012*

### *Summary:*

Deborah Jackson is a Program Director for EEC - Engineering Research Centers (ERC). Specifically she leads the multidisciplinary cluster of Microelectronics, Sensors, and Information Technologies cluster within the ERC.

When Jackson receives proposals she separates them into groups based on main topics. She then looks for panelists by asking other Program Directors for names of past reviewers. If she needs someone with specific knowledge (because the proposals can have very specific topics) she will use the search engine Zotero to complete a “background” check on the reviewer to see what papers they have written or to find a website about them. She records the names so that she can call on them later for another panel.

The step that is the most time consuming is finding people to be panelists. She has to search for people to invite to the panel and this can be especially difficult if a topic is very narrow. If a person says they cannot attend a panel, she will email them back and ask if they could be an ad-hoc panelist and still evaluate proposals.

Once she finds her panelists she gives the list of names to her Administrative staff member, Marshall Horner, who emails them the instructions for the panel, travel set-up, and access to FastLane. Jackson assigns proposals to the panelists randomly by expertise and sets a deadline of the Friday before a panel for when the panelist summaries are due in FastLane. That weekend, Jackson makes sure she is reachable in case any panelists have questions for her.

### *Jackson's suggestions for improvement of panel selection system:*

An improvement Jackson would like to see is a web interface for responses from panelists because she may miss emails in her busy inbox. One requirement is that it must save her time. Jackson was open to using SharePoint if it saves her time. She is not very confident in her knowledge of SharePoint but is interested in learning more. She does not have a lot of time for trainings and would prefer a bank of step-by-step procedures for completing tasks in SharePoint.

Jackson made a couple of suggestions for improvements of the forms we have further developed. Adding a place for a potential panelist to decline attending a panel but mark that they are willing to be an ad-hoc panelist would be beneficial to Program Directors. Jackson also suggested getting rid of the “No preference” option on our forms because as a Program Director she does not want to give them the option to refuse to review a proposal unless it is a conflict of interest.



## Summary of Program Director Interview with Dr. Alan Cheville

*Tuesday, November 13, 2012*

### *Summary:*

Dr. Alan Cheville is the Program Director in the Engineering Education and Centers division for the Engineering Education Research program. He is the lead of this particular program and manages all the panels for the program. His program accepts proposals twice a year and sets up panels for the proposals that meet all the criteria of the program to be reviewed. Each panel has between eight to fifteen panelists who review multiple proposals in a two day period.

When Dr. Cheville organizes a panel the first thing he has to do is book a room six months in advance to guarantee an adequate space that will fit all the panelists. Within three months of the panel he starts to search for panelists who will review proposals. Dr. Cheville sends out mass emails to panelists that he believes would best fit the proposals to be reviewed in the panel. He pulls panelist's names from panels that he has previously held as well as looks to have at least one new panelist. Once he has enough people to fill a panel, he emails anyone who did not make it into the panel, thanking them for their willingness to volunteer, and assuring them that they will be considered for future panels. When he has finalized all the panelist's names, he gives the list to his Program Assistant to gather further necessary information about each panelist, enter them into the PARs system and FastLane, and finalize details of the panel.

Once Dr. Cheville has panelists, he starts new email chains asking for dates the panelists will be available to go to the NSF for the panel. This information confirms the panel dates he was considering and the number of panelists he will have. Next, the panelists must identify their own conflicts of interest for each proposal that will be reviewed located in FastLane. From the information he has gathered from the panelists, Dr. Cheville makes a matrix (as seen in Figure 2-5) outlining each panelist's individual assignments and conflicts of interest.

Dr. Cheville is our liaison for this project. He came up with the idea for using SharePoint 2010 to improve the panel selection process. With each demonstration we gave him, he gave us specific feedback on improvements that could be made and changes he would like to see.

### *Dr. Cheville's suggestions for improvement of panel selection system:*

Dr. Cheville would like to automate the storage of the panelist information and data so less time is spent shuffling through emails and sending out mass email chains. His specific improvement suggestions are described in Appendix G.

## Summary of Program Director Interview Anonymous

*Monday November 19, 2012*

### *Summary*

We interviewed a Program Director with the EEC-ERC program. They are a relatively new Program Director who has only been working in the position for three months but has been working with the panel set-up process for five to six years.

They said the steps for the site visits and an inside NSF panel are different, and for the sake of time, we discussed the inside NSF panel process. First, they look over the proposals and come up with a range of expertise that is needed to review all the proposals. Next, they invite the panelists. After the panelists have accepted and Marshall, their Program Assistant, has started setting up the room and travel arrangements, the Program Director starts making their own spreadsheet that lists the proposals to be reviewed as well as each individual panelist and his/her assignments for each proposal. Occasionally, this Program Director holds a webinar to describe the panel preparation to the panelists and all the required actions the panelists must take. Since panelists can be anyone from a CEO to a professor, this Program Director starts this whole process six months before the panel date to accommodate each panelist's busy schedule.

According to the Program Director, the most time consuming part of the panel is when the panel date has arrived. Actually running the panel and organizing all of the panelists takes the most amount of their time. The ERC program that they work with tends to receive proposals about the same topic, so they normally only have to run one panel at a time. At each panel the panelists review twenty to twenty-five proposals.

The strongest part of this process is their Program Assistant, Marshall Horner. The Program Director said that Marshall Horner is very organized and helps a lot with the set-up of the panels. The Program Assistant essentially takes on the responsibility to set-up the entire panel as soon as this Program Director generates his list of panelists. As far as the weakest part of the process, the Program Director said that over the years bugs have been worked out with the system. The most common source of error is human error via miscommunication.

This Program Director has not used SharePoint for anything yet. They worry about the firewalls and the added security that SharePoint would need to be used for the entire panel set-up process. Thus far, this Program Director has done everything on FastLane, which had worked well for them for the past year to year and a half. Although FastLane has been working, the Program Director declared that the system is cumbersome and the structure of a person writing a review and pasting the text into FastLane can create complication such as information getting lost or if the panelist is new to FastLane, people not know how to correctly save the changes they make to the reviews.

### *Suggestions for improvement of panel selection system*

This Program Director said the biggest problem with FastLane is that only one person can edit a document at a time, which makes the compiling of the review cumbersome. They said it would be best if a system like SharePoint, with higher security, could be used so that multiple people could edit a document at the same time.

## **Appendix C: Interview Protocol for Gwen Hardenbergh, Program Support Manager**

### Interview Protocol

Good Afternoon (or Morning). We are the Worcester Polytechnic Institute project team, Ian Lukens, Chris McAndrews, Emily Miner, and Victoria Stratton, working for Dr. Cheville. Our project is to improve the efficiency of the panel selection process in the EEC division using SharePoint 2010. We would be very appreciative if you could spare time to answer our questions.

1. How long have you worked at the National Science Foundation?
  - a. Have you always been a part of the Engineering Education and Centers division?
    - i. If not where else have you worked?
2. As a Program Support Manager for the EEC, what are your specific responsibilities, specifically with the panelist selection process?
3. Please describe the current panelist selection process as well as how the invitations are sent out.
4. Please describe some challenges that you have faced when organizing panelists.
5. Based on the questions that we have asked could you recommend any other staff members who could give us more insight or a different perspective on the panelist selection process?

## Summary of Interview with Gwen Hardenbergh

*Thursday, November 1, 2012*

### *Summary:*

Gwen Hardenbergh is the Program Support Manager in the EEC division. She has worked in the EEC division for three years and a total of twenty-nine years at the NSF. Previously, she has worked in the Astronomy, Biology, Math & Science, and Education & Human Resources directorates. In the EEC her responsibilities are to look after workflow and performance issues. She coordinates the training for the EEC Program Support Staff so that they are able to complete their tasks properly and on time. We interviewed her because she seemed to know exactly what was going on in the division and was our go-to person for any questions about the norms within the division. Hardenbergh gave us an overview of how the panel selection process operates, although Program Directors do things differently within different programs.

### *Panel Selection Process Overview:*

Once a Program Director has secured a list of panelists for a panel, the Program Support Staff take the list and sends the emails out to organize the logistics of the panel. Many Program Directors use a NSF database called Proposal and Reviewer system (PARs) to find panelists for the panel. The PARs database stores all the information of a panelist that has reviewed on a panel before and Program Directors can search using keywords to find an expert in a certain field. The system keeps track of the average grades a reviewer gives and how many times they have served on a panel. As with every software program, it has disadvantages. For example, name mix-ups are common if the user is not paying attention. The database will sometimes have a person recorded more than once if the user did not check for the panelist record before adding them.

Hardenbergh has noticed that within the division the biggest problems with the panel selection process relate to conflicts of interest (COI). She suggested having a matrix of the COI rules which can help a Program Director or panelist decide whether they can review a proposal or not.

Hardenbergh was also able to clarify that AAAS fellows are not official NSF (government) employees so they do not fall into our group of interviews. The information we got from Hardenbergh was very helpful to understanding the overall process for the panel selection process.

## **Appendix D: Program Support Staff Interviews**

### Interview Protocol

Good Afternoon (or Morning). We are the Worcester Polytechnic Institute project team, Ian Lukens, Chris McAndrews, Emily Miner, and Victoria Stratton, working for Dr. Cheville. Our project is to improve the efficiency of the panel selection process in the EEC division using SharePoint 2010. We would be very appreciative if you could spare time to answer our questions.

1. Please give an overview of your role in the panel selection process.
2. Which steps of the process are the most time-consuming? Why?
  - a. What is the time range for each step?
3. What works well in the current process?
4. Ideally, how would you improve the process?
5. How are panelist data collected and stored?
6. How comfortable/experienced are you with SharePoint 2007 and/or 2010.
  - a. How would you feel about learning a new way to complete your job, such as using SharePoint 2010?
7. Show demonstration if applicable.

## Summary of Interview with LaTanya Sanders-Peak

*Tuesday, November 13, 2012*

### *Summary:*

LaTanya Sanders-Peak is a Program Assistant for EEC – Engineering Education. Ms. Peak works specifically with Program Director Dr. Cheville in helping set up his panels. She also takes on more responsibilities when the Division Secretary or Program Specialists are not in the office.

For the panel set-up process, Ms. Peak works directly with the Program Director to make sure all the logistics are completed. First, Peak gets information about a panel, such as the running dates, from Dr. Cheville and enters the panel into the PARs system, the panel administrations system. Next, the Program Director gives Peak a list of people he is thinking about inviting to the panel, and Peak makes sure that she has gathered each person's information such as expertise, institution or organization, email, and phone number and then makes sure the potential panelist is entered into PARs. Peak said that this particular step of locating the individual's information is the most time consuming part of the entire process. Then, Peak goes into eJacket to set up a template for the letter that each panelist will receive with his/her username and password for logging into FastLane. After the Program Director has a list of panelists that are willing to come, Peak sends out a letter containing the conflict of interest form, the hotel form, the summary of required actions, and briefing slides describing what a panel is and the different roles of panelists.

The day before the panel, Peak has to go into the conference room going to be used and prepare the room. The preparation includes arranging all the name tags, labeling the different proposals, printing out the proposals and matrix, and setting up each of the computers that the panelists will be using. The day of the panel, Peak has a sign in sheet that ensures that every panelist has filled out the required forms including the conflict of interest form.

Peak does not use SharePoint for much of this process. Instead, she said that using the P-drive, the internal driver, is quicker for the administrative staff to use. The only interaction she has with SharePoint is that when retrieving information from Dr. Cheville, who uses SharePoint to store documents containing the information she will need.

### *Peak's suggestions for improvement of panel selection system:*

The major suggestion Peak made was to find a way to make it a more "green" process by reducing the amount of paper she has to print out. Between the printing of individual forms and the proposals, LaTanya has to use a lot of paper in the set-up of a panel, most of which is just shredded after the panel. She suggested somehow generating the proposals on SharePoint in the future so paper could be saved. Unfortunately, the permissions of the FastLane and eJacket site prevent this from becoming a possibility at the present time.

## Summary of Interview with Marshall Horner

*Monday, November 19, 2012*

### *Summary:*

Marshall Horner is a Program Assistant to Program Directors in the EEC. We interviewed him to get another perspective on the panel set-up process and the steps he goes through to set up a panel.

Horner's first step is to check if there are rooms available for the dates of the panels that the Program Director wants to hold. That starts when the Program Director gives him a list of the panelists for each panel. Once Horner has the list of panelists, he sets up a caterer, reserves the equipment, and gets the IT team all set up for panelists and puts the panelist information in the PARs system (panel #, full name, PARs #, address, company or institution). If a reviewer is going to call in, he requests a call-in number to be available to them. He drafts up a letter with all the directions for the panel to send to all the panelists in an email. He sends the email to all the panelists and he is in charge of all the correspondence with panelists from this step onward unless a specific case needs the Program Director's attention.

Once the Program Director has assigned the roles to the panelists, Horner checks if each panelist is in the PARs system and if not, he adds them. He also assigns each panelist their roles in the PARs system. Some Program Assistants do not check if there is already a profile for a panelist in the PARs system so they create a new one. Some panelists are in the system up to three times. Horner notices these things and works to fix this problem. Some people within the division are not good with Excel so Horner will make changes and clean up the matrix used by Program Directors to assign roles and proposals.

The next step is to help any panelists with travel and lodging arrangements. The first-time panelists need extra help when it comes to the travel forms. The day before the panel Horner will set up the room reserved for the panel. He will have prepared nametags, room signs, and folders with all the documents needed for the panelists. He says that it takes approximately forty hours to set up an entire panel.

The most time consuming part of the process is the day of the panel. Depending on the location, Horner must come in very early to set up and some Program Directors require Horner to be present throughout the entire two day panel. Panelists get access to FastLane about six weeks before a panel if the Program Director is on top of their tasks, and three weeks before a panel if he receives the list of panelists later. A "good" list has Panelist Name, and PARs number. A "bad" list has missing or incorrect information. Horner, the main communicator via email with panelists, saves every email and stays organized using folders for each Program Director, panel, and panelist in his Outlook mailbox.

Sometimes there are no appropriate rooms available in the NSF for a panel, so the panel must be held off-site in a nearby hotel. This adds steps to the panel set-up, but it is generally the same process. Horner has to negotiate a contract with the hotel and get it passed by the NSF Contracting Office. He has to rent equipment (projector, computers, etc) from IT and get a team to help set that up. He has to make sure that the logistics of the hotel location is known to the panelists so they can find lodging nearby the hotel and not near the NSF. On the day of the panel he must go to the off-site location around 5:30 AM and set up all the equipment since he cannot set up the day before.

*Suggestions for Improvement:*

Horner said he would like to improve how quickly and accurately a Program Director gets the list of panelists to the Program Assistant. The sooner a Program Assistant has the list, the sooner they can work out the details of the panel. He also feels that it would be better to use SharePoint to store documents that panelists need during the panel instead of printing them out.

*Suggestion for Demonstration:*

Get WebEx on computers for screen sharing. Call HelpDesk (xHELP).



## Summary of Interview with Avis Taylor-Ikeji

*Monday, November 26, 2012*

### *Summary:*

Avis Taylor-Ikeji has worked as an Assistant at the National Science Foundation for eight years. Taylor-Ikeji started working in the Biology Directorate and received her most helpful training there as it is the test studies division. She has also worked in the Undergrad division and now the Engineering Education and Centers (EEC) division as Division Secretary mainly for the Division Director, Theresa Maldonado. Taylor-Ikeji handles the scheduling of events, staff meetings, and career meetings within the division. She takes the information that is sent to her by Program Directors and puts it all in the SharePoint calendar. Program Directors are supposed to update the calendar with their events, but they run out of time or forget and their assistants or Taylor-Ikeji end up doing it for them. She also uploads any brochures, power points, papers and training materials to the SharePoint site for reference by EEC employees.

Taylor-Ikeji has some experience as a Program Assistant and dealing with the panel selection process and using the PARs system. She says that if we were to implement anything new, she would need a manual that she could refer to with detailed steps outlining how to do common actions. She said the best would be to have someone sit down with her and be patient and show her the steps. But since this is uncommon, manuals would work also. She is a visual learner and likes to have things broken down for her. She receives a lot of training and help from the Program Support Manager Gwen Hardenbergh on tasks she is unsure how to do.

### *Suggestions for Improvement:*

While Taylor-Ikeji does not work on the panel selection process, she does handle the travel and Guest Travel system within the division. When Program Directors travel to site visits or institutions, they have to submit their expense report and receipts to her. Taylor-Ikeji suggested having forms where the traveler could directly submit their travel information and expenses. Ideally, the forms would track progress, send reminders to submit information, and upload receipts and travel information. Sometimes Taylor-Ikeji has to hunt down the travel forms from people to get what she needs. She manages the Guest Travel system also which reimburses the guests who travel to the NSF. They are given a flat rate for travel and make their own travel arrangements.

## **Appendix E: Summary of Conversations with Panelists**

Tuesday, November 6, 2012

### *Panelist 1-First-time panelist*

This panelist had never done a panel before, and noted that they had extra difficulties as they were coming from overseas. This made travel hard to arrange. They volunteered for the panel through a list serve, and after a week of emails asking for extra permission for trans-continental travel, they were successfully made a panelist.

They said that they found the review matrix confusing and would like a process with less “digging” for information. This panelist also noted that they enjoyed the panel a lot.

### *Panelist 2- Experienced Panelist*

This panelist has been to panels 6-7 times (5<x<10). They contacted Dr. Cheville to tell him they were interested in being on a panel. They were very direct in their petition. This panelist felt that the travel arrangements were straight forward to navigate. They preferred the matrix that Dr. Cheville uses to organize panelists and proposals compared to using the FastLane navigation and said that they dislike going back and forth between screens. They noted that Dr. Cheville was the only PD that split lead reviewer and scribe into two different positions. They had questions about any conflicts of interest because they were unsure of the guidelines for professional vs. personal relationship with a Proposal Investigator.

This panelist offered their opinion about the potential misuse of the preferences option on our forms. They said that some reviewers might misuse that option to review a proposal they do not like and grade it poorly. It could contribute to biases within the panel and they felt it would have negative effects on the reviewing of the proposals.

### *Panelist 3-Experienced Panelist*

This panelist received an email asking to sit on a panel sometime in November. The email was sent about six weeks before the date of the panel. They responded yes and then received a follow up email with more specifics and dates. They were sent incorrect dates for the panels. This was human error and is caused some frustration for the panelist. They had already reserved a hotel room but things got mixed up. They received their proposal assignments in FastLane about three weeks prior to the panel. This panelist felt that the whole process was “pretty straightforward”.

### *Panelist 4-Experienced Panelist*

This panelist was emailed directly by Dr. Cheville who asked if they were available to sit on the panel. After they emailed him back he assigned them to a panel and proposals. They responded to him if they had any conflicts of interest and he changed their assignments. They went through this iteration twice. The whole process from the first email to the panel was about six weeks long. Dr. Cheville cut and pasted the wrong date for one panel so that created problems with scheduling which were repaired when they brought it to his attention.

#### *Panelist 5-Experienced Panelist*

This was a seasoned panelist and did not have any problems with the panelist invitation process. They liked the process and had no qualms with it. It is possible that any difficulties they might have had they probably had experienced before so they did not get acknowledged.

However, this panelist sent their date preferences to Dr. Cheville and was incorrectly assigned to a different panel that they were unable to attend. They emailed Dr. Cheville back who fixed the mistake.

#### *Panelist 6-Experienced Panelist*

This panelist had been in many panels before and with multiple divisions. They said the invitation process was straightforward. It involved a few emails back and forth and was generally painless although they noted that they were first sent the wrong date for the panel. They also found the review matrix difficult to read, and this actually caused them to review the incorrect proposal – missing one of their assignments.

This panelist also noted that they had difficulty giving any proposal preference since they could not access proposal summaries. They had trouble identifying if they had the necessary expertise to accurately review when only given the proposal title.

#### *Panelist 7- First-time panelist*

This panelist was very excited about the opportunity to serve on a panel; however, they were very nervous and unsure about the panel protocol. They received an email from Dr. Cheville via a list serve looking for a panelist and they volunteered. The email was sent out about six weeks before the panel took place. They received another email from Dr. Cheville asking which panel they would be available to attend and responded with their preferences. Dr. Cheville then replied to them with the date of the panel and the proposal assignments. The rest of the arrangements were made through a program assistant.

This panelist had trouble with the travel arrangements because they had a special case and were unsure of the window of travel. They also were unsure if they actually had a conflict of interest so they emailed Dr. Cheville who was able to confirm that it was. Felt that “expertise” on the form would be a daunting question so they suggested changing it to “interests”.

## Appendix F: Demonstrations

### First Demonstration with Dr. Cheville

Tuesday, November 13, 2012

#### Forms

Below are screenshots of our first forms with their corresponding names for ease of reference when reading the summary of the demonstration.

**National Science Foundation**  
**Assign Panelists to Proposals**

Change Currently Selected Panel

Panel 1 Panel 2 Panel 3

*Prefers to Review*

Ian Lukens

Lead Scribe Reviewer1 Reviewer2

*No Preference*

Christopher McAndrews

Lead Scribe Reviewer1 Reviewer2

*Prefers Not to Review*

Lead Scribe Reviewer1 Reviewer2

Assignments for Panel 1

Proposal Information:  
1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute

Role	Name	# of times
Lead for Proposal	Christopher McAndrews	4
Scribe for Proposal	Christopher McAndrews	1
Reviewer for Proposal	Emily Miner	3
Reviewer for Proposal	Christopher McAndrews	2

Previous Submit Changes and Close Next

1 of 1

Finalize and Email Panel

Note: Clicking this button will email all panelists their assignments. Any changes from this point on will trigger additional emails.

Figure F - 1: Assign Panelist to Proposals form

Lists

Panel Dates

Libraries

Assign Panelist to Proposal

Assign to Panels

Review Panel

Panel Set Up

Panel Dates

Panelist Invitees

Admin Form Options

NSF Administrators' Contact Information

Help Documents

Panelists

Panelists

My Info

Proposals

Proposals

Assign Roles

Tasks

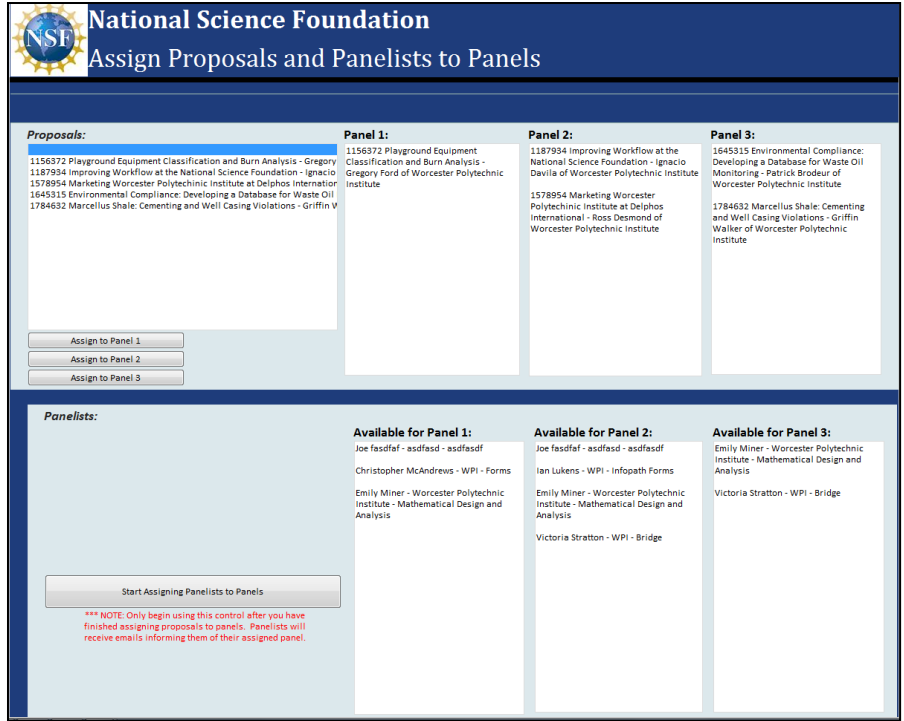
All Tasks

My Tasks

Panelist Survey

People and Groups

Figure F - 2: Navigation Bar



**Proposals:**

1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute  
 1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute  
 1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute  
 1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute  
 1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute

**Panel 1:**

1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute

**Panel 2:**

1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute  
 1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute

**Panel 3:**

1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute  
 1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute

Assign to Panel 1  
 Assign to Panel 2  
 Assign to Panel 3

**Panelists:**

**Available for Panel 1:**  
 Joe fasdfaf - asdfasd - asdfasfd  
 Christopher McAndrews - WPI - Forms  
 Emily Miner - Worcester Polytechnic Institute - Mathematical Design and Analysis

**Available for Panel 2:**  
 Joe fasdfaf - asdfasd - asdfasfd  
 Ian Lukens - WPI - Infopath Forms  
 Emily Miner - Worcester Polytechnic Institute - Mathematical Design and Analysis  
 Victoria Stratton - WPI - Bridge

**Available for Panel 3:**  
 Emily Miner - Worcester Polytechnic Institute - Mathematical Design and Analysis  
 Victoria Stratton - WPI - Bridge

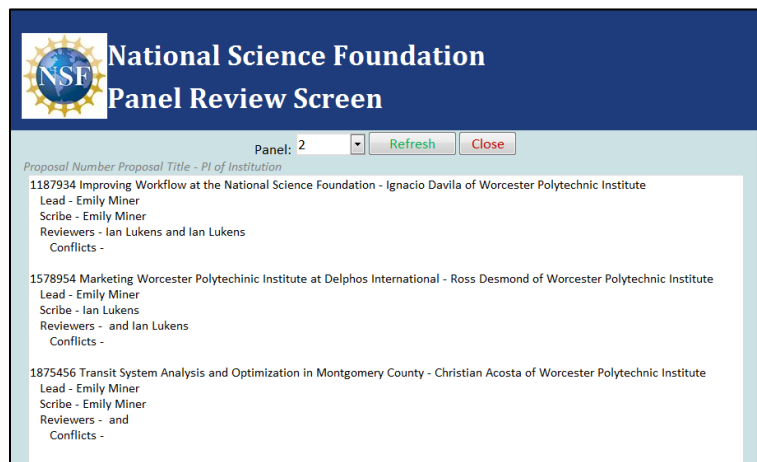
Start Assigning Panelists to Panels

\*\*\* NOTE: Only begin using this control after you have finished assigning proposals to panels. Panelists will receive emails informing them of their assigned panel.

Figure F - 3: Assign Proposals and Panelists to Panels form

Proposal Number	Panel Assignment	PI Last Name	PI First Name	Institution	Title	Lead	Reviewer 1	Reviewer 2	Scribe	Assignments Finalized
1245932	1	Amador	Francisco	Worcester Polytechnic Institute	Advanced Patent Application Analysis	Christopher McAndrews			Christopher McAndrews	<input checked="" type="checkbox"/>
1875456	2	Acosta	Christian	Worcester Polytechnic Institute	Transit System Analysis and Optimization in Montgomery County	Emily Miner			Emily Miner	<input type="checkbox"/>
1784632	3	Walker	Griffin	Worcester Polytechnic Institute	Marcellus Shale: Cementing and Well Casing Violations	Christopher McAndrews	Emily Miner			<input checked="" type="checkbox"/>
1645315	3	Brodeur	Patrick	Worcester Polytechnic Institute	Environmental Compliance: Developing a Database for Waste Oil Monitoring	Christopher McAndrews	Christopher McAndrews	Emily Miner		<input checked="" type="checkbox"/>
1154886	3	Freyermuth	Jeffrey	Worcester Polytechnic Institute	Cataloging Emergency Response Vessels	Emily Miner		Christopher McAndrews		<input checked="" type="checkbox"/>
1187934	2	Davila	Ignacio	Worcester Polytechnic Institute	Improving Workflow at the National Science Foundation				Emily Miner	<input type="checkbox"/>
1156372	1	Ford	Gregory	Worcester Polytechnic Institute	Playground Equipment Classification and Burn Analysis	Christopher McAndrews	Emily Miner			<input type="checkbox"/>
1578954	2	Desmond	Ross	Worcester Polytechnic Institute	Marketing Worcester Polytechnic Institute at Delphos International	Emily Miner	Ian Lukens	Ian Lukens	Ian Lukens	<input type="checkbox"/>
*										<input type="checkbox"/>

Figure F - 4: Assign roles manually view.



**National Science Foundation Panel Review Screen**

Panel: 2 Refresh Close

Proposal Number Proposal Title - PI of Institution

1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute  
 Lead - Emily Miner  
 Scribe - Emily Miner  
 Reviewers - Ian Lukens and Ian Lukens  
 Conflicts -

1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute  
 Lead - Emily Miner  
 Scribe - Ian Lukens  
 Reviewers - and Ian Lukens  
 Conflicts -

1875456 Transit System Analysis and Optimization in Montgomery County - Christian Acosta of Worcester Polytechnic Institute  
 Lead - Emily Miner  
 Scribe - Emily Miner  
 Reviewers - and  
 Conflicts -

Figure F - 5: Panel Review Screen

## *Summary*

In order to start receiving formal feedback on our system, we preformed our first demonstration with Dr. Cheville. We set up the demonstration on computer for Dr. Cheville and allowed him to navigate through all the steps of setting up a panel while we all watched and described different parts when he had questions or comments. Dr. Cheville filled out all the panelist forms, gave out panel assignments (Figures F-1 and F-3), and reviewed all the assignments (Figure F-5). We tried not to push him through the process but rather let him figure it out on his own, so we could get a feel for how user friendly our SharePoint 2010 site is. We went through each of the five screens shown above and wrote down the comments, suggestions and questions Dr. Cheville had on each one. We also discussed how the different screens and capabilities of our SharePoint 2010 system could help not only the Program Director but also the Program Assistant and the DIS employees. For instance, the Access table in Figure F-4 can be used by DIS as a list of people who will need usernames and passwords to get access to the site and can be used by Program Assistants as a checklist to make sure everyone is in the FastLane system. Unfortunately, the firewalls at the NSF prevent us from being able to put direct links to FastLane onto the site, so the proposal cover sheets and summaries that the panelists have to read need to be downloaded off eJacket and manually uploaded onto the SharePoint site for the panelists to access them outside of FastLane. The last thing we discussed during the demonstration was the different options that the Program Directors have depending on which stopping point they chose while using our SharePoint 2010 panel selection process system. For example, if the Program Director choses to stop using our system after all the panelist data has been gathered and the panel assignments our made, the Program Director can use the summary screen shown in Figure F-5 to make final assignment and generate their own matrix. Listed below are specific comments and improvements that Dr. Cheville made about the SharePoint system we have developed.

### *Suggestions for Improvements:*

- A button on the assignment form (Figure F-1) that asks the Program Director if he/she is sure that everyone panelist has been assigned a panel before submitting would be useful
- Reminders that should be put in place:
  - o A six month and one week reminder for Program Director and Program Assistant to book a room for the panel
  - o Want a reminder three months before the panel and every two weeks after to email the Program Director to invite panelists to their panel with a way to turn off this reminder once its accomplished
- The tabs on the Navigation bar should display the workflow, or order of sequential order of processes, that the Program Director and Program Assistant go through → panel set up and break down between PA and PD, step by step layout even if redundant
- Need to figure out the function of SharePoint tab
- Whenever a panelist accepts a panel date, system should email the Program Director and Program Assistant to update Program Director and to check if Program Assistant added the new name to FastLane

- Send out an email to the panelists who were not chosen for a panel saying thank you for volunteering but all the panels have been filled after the form in Figure F-1 is filled out
- Panel assignment column should be shaded a different color so people know not to do anything in that column
- Send panelists an email reminding them of a deadline
- Wants a dashboard containing the following items:
  - o Count how many days until panel
  - o Count how many invites sent and responses received with links to page
  - o 1 page panel summary to date (overall status)
  - o Flag what did not happen yet but needs to get done
  - o Check points
- Instructions for use on assigned page (Figure F-3)
- Talk to Gwen or DIS to see if there is a way to get the information from the panel review imported into PARs
- Need a way to get raw data into excel
  - o Only need proposal number not name
  - o Each proposal should have a list of reviewers, wants to export to a CSV file than put it into excel to make his matrix
- Link for FastLane and Panel instructions
- More colors would make it more powerful and easier to visualize

## First Demonstration with Gwen Hardenbergh

*Friday November 16, 2012*

### *Summary*

After receiving feedback from the Program Director's point of view, we did a demonstration in front of Program Support Manager Gwen Hardenbergh to get the administrative view point on our proposed system. We had Hardenbergh go through all the steps of setting up the panel and remark on whether each step would result in more work for an assistant or in a reduction of work. From observing her go through all the steps, we learned that in our training modules we should include a key explaining each icon as well as instructions on where to click for certain steps. We also learned more details of the specific steps that are taken when setting up a panel. She had questions for us such as who received each of the reminder emails and how does the assistant distinguish between which reminder email is for which panel. From these questions, we decided to make the reminder more descriptive and add in the name of the panel into each email. Hardenbergh gave us insight into what parts of the system are confusing as well. For example, we have to clearly define who does each step such as checking off the Fast Lane check box in one of the lists. Also, we had one tab on the Navigation Bar (Figure F-2) labeled proposals as well as a tab on the dashboard, so when Hardenbergh clicked the wrong tab, we realized we should rename one of them. Hardenbergh also informed us about the EIS report that pulls information from FastLane about the various proposals and shows the lead and coauthors of each proposal, information we did not think we could get. Also, this report is in an Excel-friendly format and may be able to be copy and pasted into a SharePoint list. Hardenbergh particularly liked the new dashboard we had created for our SharePoint site.

### *Suggestions for Improvement*

- Need to know anticipated number of panelists to book room
- Add to panel task list where room is reserved
- Add column for university and state of each panelist (location on panelist form)
- Need the panelists to register by a certain date
- Rename the two Proposal tabs
- Need to explain where to fill out lead, scribe, and reviewers
- Need a list with all the conflict of interests that each panelist has so the Program Assistant can enter it into PARs
- Need to clarify how panelists do not get access
- Each Program Director will need their own external SharePoint site
- Make sure all the information about panels (ie number of panelists and proposals per year) is easily collected in SharePoint for the end of the year report
- Site might need to be able to handle 4-5 panels at once
- Figure out how long the site will hold the records from a panel



## Second Demonstration with Dr. Cheville

*Tuesday, December 11, 2012*

In order to go over the changes since the staff demonstration, we held another demonstration with Dr. Cheville. We told him of the set reviewer and collaborative roles features that have been changed with the system as well as the workflows that have and have not been implemented.

We went through each of the steps of setting up a panel. In the “Invite Panelists” tab, Dr. Cheville was worried that the “mail to” email addresses would not work. We informed him that mailing to our NSF emails work but sending outside of the NSF databases has not yet been accomplished. Unfortunately, we could not look further into this problem since only DIS or the IT department has the permissions to change anything. The next topic discussed was changing what the automated emails say. Currently, the developer’s manual describes what the outgoing emails say, but in order to change the message, an employee would have to go through DIS since we do not have access to SharePoint Designer. Next, the dashboard was looked over. Dr. Cheville likes the features of the Dashboard, but said it would be nice if a link to the pdf version of the manual could be displayed for easy reference. We then talked about how “Panel Tasks” is a reoccurring tab that is opened at different point of the process. Dr. Cheville said it would be best to move this tab under the Manual Update heading. Finally, we went over how to reset all the forms and fields on the site after the panel had been completed.

We made sure to inform Dr. Cheville that all the testing that we were able to perform is in the testing protocol, and all the workflows that we were unable to implement are described in the developer’s manual. We also discussed that in order to make changes, one has to be an owner on the site and not just a Program Director, which is something that only DIS can grant permissions. We informed him that we believe that all the forms should work once the workflows are up. Overall, the demonstration went well and Dr. Cheville liked the work that we had developed and that everything looked relatively straightforward and easy.

### *Suggestions for Improvement:*

- Add link to see the email that is formatted
- Put link to developer’s manual in “Admin Settings” tab of the Dashboard
- Move the “Panel Tasks” under the Manual Update Heading
- Make sure the manual describes how and why each task is performed in the system
- Make Form Update more descriptive
  - o Rename to: Add reviewers and proposal to panel or Invite reviewers/add proposals
- Might be easier to have DIS make a new external site inside of deleting all the fields
- Put a less than and greater than signs on the buttons of the “Assign Roles” form
- Make the center button on the “Assign Roles” form smaller and make it read Save and Exit

## **Appendix G: Focus Groups on Use of SharePoint**

### Summary of Focus Group

*Thursday November 29, 2012*

As part of our project, we held a demonstration at one of the bi-weekly EEC staff meetings. We were allotted a half-hour to give our presentation and demonstration. Seventeen of the twenty-one staff members were present during the meeting.

Prior to the demonstration, we held a ten minute presentation outlining the five major features of the SharePoint 2010 system we had been working on: visual workflows using the sidebar on the site, a central location for all the documents panelists need to fill out, a dashboard that displays the status of the panel on a day to day basis, automated reminders, and the flexibility of the system. The presentation went well with very few interruptions. Half-way through the demonstration, two of our team members left the room to return to our office and act as panelists during the demonstration.

For the demonstration, we used a free web-based program call VSee. This program, recommended to us by Dr. Cheville, allows users to call each other and share each other's screen at the same time. So when the demonstration started, we were able to see Emily and Chris's respective screens, since they were both out of the room acting as panelists. This allowed the staff members to see the panelists filling out the forms with their information. Once the "panelists" filled out the forms, Ian and Victoria, who were still in the room acting as administrators, filled out the forms that the Program Directors would use to assign panelists and proposals into panels. By showing the interactions between the administrator steps and the panelist steps, we were able to display a large portion of the system. During the demonstration, staff members were able to ask questions about the different processes and forms.

After the demonstration, we held an open discussion and this allowed staff members to ask any remaining questions. Once all the questions were answered, we handed out surveys to each of the staff members to receive feedback on using SharePoint 2010 for the panel selection process. We also asked for any recommendations that the staff members may have for our system or for the use of SharePoint 2010. Overall, the demonstration was very successful, and the staff members seemed very open to the idea of using part or all of our SharePoint 2010 panel selection system.

#### *Suggestions made during discussion:*

- Make sure that one panelist cannot be assigned two roles on one proposal
- Certain programs require a set number of reviewers, so there should be a variable that has the Program Director chose how many reviewers are on each proposal
- May want a list of all the panelists that have been used and how many times they have been used for panels
- Try to get a DIS contact to see if PARs or FastLane could take information from the site
  - o May be hard to do because of all the Firewalls

Post Focus Group Survey Questions

We would be very appreciative if you could take some time to complete our survey.

1. What is your position title? \_\_\_\_\_
2. On a scale of 1 to 4 how confident are you that you would be able to use this system as presented? (1-Not likely, 4-Highly likely)  

1                      2                      3                      4
3. How do you best learn about how to use a new system? For example, reading or videos.
  - a. Reading Manuals
  - b. Videos
  - c. Other: \_\_\_\_\_
4. Of all features presented today, which seem(s) to have the most value to you. Circle all that apply:
  - a. Central Location for Documents
  - b. Automated Reminders
  - c. Collection, storage, and utilization of useful panelist information
  - d. Panel Status Display (Dashboard)
  - e. Flexible System Options
  - f. Other: Please Specify \_\_\_\_\_
5. Of all the features shown today which one(s) will have the least value to you. Circle all that apply:
  - a. Central Location for Documents
  - b. Automated Reminders
  - c. Collection, storage, and utilization of useful panelist information
  - d. Panel Status Display (Dashboard)
  - e. Flexible System Options
  - f. Other: Please Specify \_\_\_\_\_
6. Now that you have seen some of the capabilities of SharePoint for automating processes like the panel process, can you think of other things SharePoint could be developed for?

## Summary of Survey Question Results

From the results of the surveys, we were able to generate a full summary of the individual surveys, found in the Figure G-1 table. For the sake of results and to fully judge the success of our demonstration, we included the responses of the different Fellows within the division even though they do not help set up panels.

### Summary of Survey Results

Title	Confidence	Learning	Best features	Worst features	Comments
Program Director	3	By doing	Central Location for Documents	Automated Reminders	reviewer expertise/contact/type of panel they served/ all on the database
			Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
			Flexible System Options		
Program Specialist	---	Reading Manuals	Central Location for Documents	Automated Reminders	---
		Videos	Automated Reminders		
			Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
Program Assistant	3	Videos	Panel Status Display (Dashboard)	Central Location for Documents	no comments: just use the system
AAAS Fellow	4	Reading Manuals	Central Location for Documents	Automated Reminders	automated reminders not applicable to role, use SharePoint to manage group tasks better, integrate system with Outlook
		Videos	Collection and Storage of Panelist Information		
		Online Resources	Panel Status Display (Dashboard)		
AAAS Fellow	4	Reading Manuals	Central Location for Documents	---	---
		Videos	Automated Reminders		
			Flexible System Options		
Program Manager	4	Reading Manuals	Automated Reminders	Central Location for Documents	---
		Hands On	Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
			Flexible System Options		

Program Director	4	Videos	Central Location for Documents	---	use SharePoint for site visit report writing
			Automated Reminders		
			Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
N/A	---	One-on-one Training	Central Location for Documents	---	have the system be sure each panelist in a panel and each proposal in a panelist's queue are unique
			Flexible System Options		
N/A	---	Reading Manuals online	Central Location for Documents	---	summary on spreadsheet results of each panel
			Panel Status Display (Dashboard)	ie) final award recommendations and declines, serves as a report for the panel	
			Flexible System Options		
AAAS fellow	3	Videos	Central Location for Documents	Flexible System Options	SharePoint could be used to extract diversity specific material and text data from annual reports.
			Automated Reminders		A place to collect ERC specific documents without having to use FastLane, specifically for PDFs
Program Director	4	Reading Manuals	Central Location for Documents	---	Having a master spreadsheet with all the information is really useful
		Videos	Automated Reminders		
		Asking others	Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
			Flexible System Options		
Program Director	3	Playing with it	Central Location for Documents	---	ERC site visits
		Asking others	Panel Status Display (Dashboard)	System seems promising and a lot of the details/problems have been considered	
		Reading the manual	Flexible System Options		

AAAS fellow	4	Training class	Central Location for Documents	---	Perhaps have a number system for the SharePoint saying what each step is
			Automated Reminders		
			Collection and Storage of Panelist Information		
			Panel Status Display (Dashboard)		
			Flexible System Options		
Division Secretary	4	Hands On	Central Location for Documents	Collection and Storage of Panelist Information	Employee travel
			Automated Reminders		
			Collection and Storage of Panelist Information		
Program Specialist	3	Hands On	Central Location for Documents	Automated Reminders	PD's are responsible to insert their panelist information
				Collection and Storage of Panelist Information	At times there are problems with the incorrect panelist information

**Figure G - 1: Table Summary of Survey Results**

## Appendix H: Focus Groups about Training Modules

### Program Director Training Manual

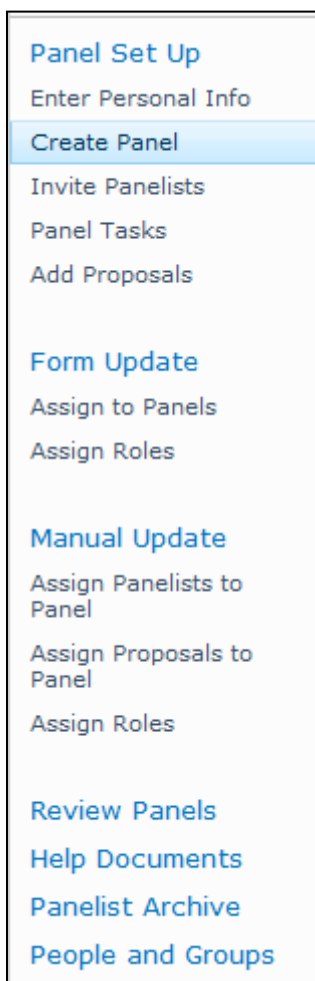
This manual contains a walkthrough of common tasks that a Program Director may be expected to complete during the setup of a panel using SharePoint 2010.

#### *Before Panelists are invited*

Before the panelists are invited the Program Director should follow the following steps.

##### *Setting up a Panel*

1. To set up a panel, go to the external SharePoint site and login in. Click on the link in the sidebar called “Create Panel”



2. Clicking this link will bring you to the “Panel Dates” page. If you want to edit an existing item double click on the picture of a pencil on paper next to that item. If you want to create a new panel click ‘Add new item’; this will open up the Panel Dates window shown in step 3.



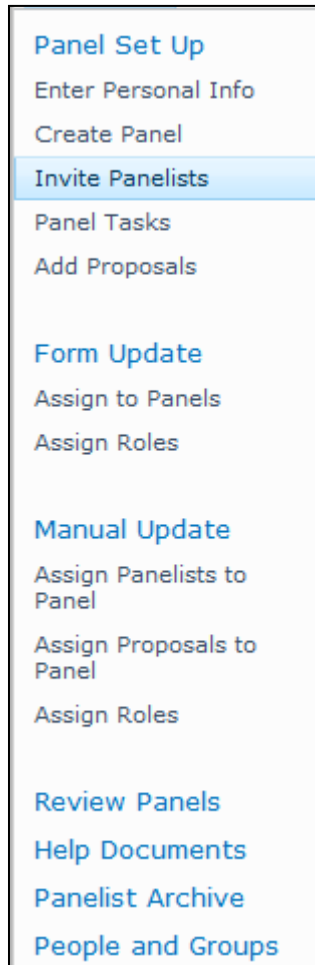
3. Fill out as much of the information about the panel as possible in the Panel Dates window, shown below. When done, click Save. This will store the entered information into the SharePoint list and will start a reminder countdown:
  - a. 6 months before the panel it will email the Program Assistant group to book a room for the panel.
  - b. 3 months before the panel it will email the Program Director group to invite panelists.

The screenshot shows a window titled "Panel Dates - New Item" with a dark blue header. Below the header is a toolbar with an "Edit" button and icons for Save, Close, Paste, Copy, and Cut. The main area contains a form with the following fields:

Title	<input type="text" value="This is a Panel"/>
Panel Number	<input type="text" value="Panel 1"/>
Location	<input type="text" value="640.07"/>
Start Date	<input type="text" value="11/28/2012"/> <input type="text" value="12:00:00 AM"/>
End Date	<input type="text" value="11/30/2012"/> <input type="text" value="12:00:00 AM"/>
Panel ID	<input type="text"/>
Number of Anticipated Panelists	<input type="text" value="12"/>

### Invite Panelists to the Panel

1. To invite panelists to serve on a panel, click the “Invite Panelist” link on the sidebar.



2. Fill out the First Name, Last Name, Email, and Phone Number for each panelist you would like to invite.

First Name	Last Name	Email	Phone Numt	SharePoint Access	Username	Password
Lauren	Siegler	<a href="mailto:kridnix@okstate.edu">kridnix@okstate.edu</a>	703-292-7107			
Josh	Block	<a href="mailto:jblock@asu.edu">jblock@asu.edu</a>	703-292-7107			
Ian	Lukens	<a href="mailto:ilukens@nsf.gov">ilukens@nsf.gov</a>	304-820-2991			

3. When finished entering the panelist information, email the link of this page to the EEC’s DIS contact and ask them to create accounts for the panelists. Have DIS add all the panelists to the “EEC Panels Pre Selection Panelists” group under the “People and Groups” tab in the sidebar. After that ask DIS to fill out the Username and Password sections of the list. Doing this will trigger an invitation email asking panelists to mark the panel dates that they are available to attend.

4. Three months before the panel, if the Program Director has not marked that the panelists are invited, the Program Director will receive an email every week reminding them to do so. To stop these emails navigate to the “Panel Tasks” link on the side bar. On the page, check off the “Panelists Invited” box for the Panels that have panelists invited.

Add Proposal Information to the site

1. Go to the InsideNSF webpage. Scroll your mouse over the “Tools” tab at the top. From the list that appears, click “Applications”. From the list of applications, click on Inside FastLane and login.
2. Click FastLane Submitted Proposals and sort by the Division Code and date range. This will filter the proposals to only include ones relevant to the panel being set up.

To search for proposals, please enter search criteria in the form below, then press the "Search" button. You can use "%" sign as wildcard in search criteria. [click this link for instructions.](#)

**Division Code** (Optional):

**Program Element Code** (Optional - as identified by PI):   Primary  All

**Program Announcement Number** (Optional - as identified by PI):

**Submission Date Range:** FROM (mm/dd/yyyy)  TO (mm/dd/yyyy)

**Proposal Type:**  Supplementals  Proposals  Both

**Sort Proposals By:**  Proposal Number  Last Name  Submit Date

**Select how the search result should be presented:**

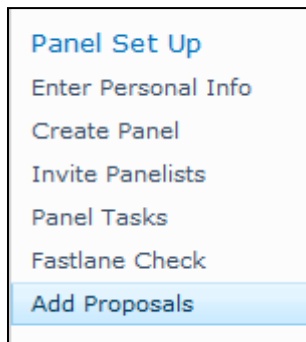
Display Selection List in Web Page With  Rows a Page

Download List to Spread Sheet

Show & Print List

Press the "Search" button to start search

3. Click Download to Spreadsheet. Then open the spreadsheet and highlight what you want to copy. Use the key combination CTRL + C to copy the highlighted sections to your clipboard.
4. Back on the SharePoint website go to the sidebar under Panel Set Up click “Add Proposals”



- Click the box next to the \* in the bottom left corner of the table and paste the contents copied from the spreadsheet with the keyboard combination CTRL + V. This action will add all the proposal information to the SharePoint spreadsheet.

EEC Panels							
Dashboard Panelists Proposals All Site Content							
<b>Panel Set Up</b> Enter Personal Info Create Panel Invite Panelists Panel Tasks Fastlane Check <b>Add Proposals</b>  <b>Panel Info</b> NSF Administrators' Contact Information Panel Dates  <b>Panelists</b>	<b>A</b>	Proposal Number	PI Last Name	PI First Name	Institution	Title	Program Announcement
	1245932	Amador	Francisco	Worcester Polytechnic Institute	Advanced Patent Application Analysis	PD 10-1340	
	1875456	Acosta	Christian	Worcester Polytechnic Institute	Transit System Analysis and Optimization in Montgomery County	PD 10-1340	
	1784632	Walker	Griffin	Worcester Polytechnic Institute	Marcellus Shale: Cementing and Well Casing Violations	PD 10-1340	
	1645315	Brodeur	Patrick	Worcester Polytechnic Institute	Environmental Compliance: Developing a Database for Waste Oil Monitoring	PD 10-1340	
	1154886	Freyermuth	Jeffrey	Worcester Polytechnic Institute	Cataloging Emergency Response Vessels	PD 10-1340	
	1187934	Davila	Ignacio	Worcester Polytechnic Institute	Improving Workflow at the National Science Foundation	PD 10-1340	
	1156372	Ford	Gregory	West Virginia University	Playground Equipment Classification and Burn Analysis	PD 10-1340	
	1578954	Desmond	Ross	Worcester Polytechnic Institute	Marketing Worcester Polytechnic Institute at Delphos International	PD 10-1340	
	*						

*Specify number of reviewers and Collaborative roles on a Proposal*

1. Navigate to the “Set Number of Reviewers and Collaborative Roles” under the “Add Proposals” tab in the sidebar.
2. Your screen should be similar to the figure below. Fill out the information as you see fit. “Number of Reviewers” is the amount of reviewers (including the Lead and Scribe) you want to have for each proposal. The default number of reviewers is four.

**\*\*IMPORTANT** All values in the Collaborative Secondary column must be separated with a “;” as seen in the second picture below.

Proposal Number	PI Last Name	PI First Name	Institution	Title
1245932	Amador	Francisco	Worcester Polytechnic Institute	Advanced Patent Application Analysis
1875456	Acosta	Christian	Worcester Polytechnic Institute	Transit System Analysis and Optimization in Montgomery County
1784632	Walker	Griffin	Worcester Polytechnic Institute	Marcellus Shale: Cementing and Well Casing Violations
1645315	Brodeur	Patrick	Worcester Polytechnic Institute	Environmental Compliance: Developing a Database for Waste Oil Monitoring
1154886	Freyermuth	Jeffrey	Worcester Polytechnic Institute	Cataloging Emergency Response Vessels
1187934	Davila	Ignacio	Worcester Polytechnic Institute	Improving Workflow at the National Science Foundation
1156372	Ford	Gregory	West Virginia University	Playground Equipment Classification and Burn Analysis
1578954	Desmond	Ross	Worcester Polytechnic Institute	Marketing Worcester Polytechnic Institute at Delphos International
1153684	Sato	Rob	Worcester Polytechnic Institute	Improving Efficiency of Panel Selections
*				

(scrolling to the right will show this below)

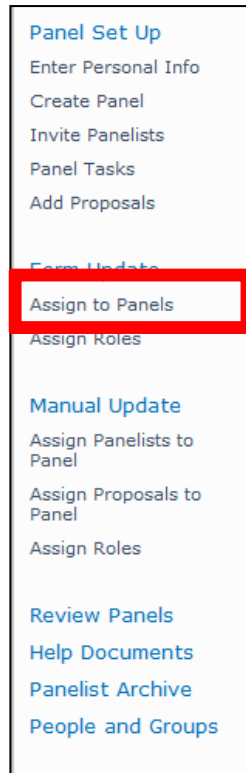
Requested Amount	Number of Reviewers	Collaborative Role	Collaborative Secondary	Collaborative Lead
\$22,300.00	4	Secondary		1315498
\$22,250.00	4	Secondary		1315498
\$20,000.00	10	Not		
\$22,000.00	7	Lead	1154886;1187934	
\$25,000.00	8	Secondary		1645315
\$30,000.00	4	Not		
\$21,000.00	9	Not		
\$42,000.00	5	Not		
\$50,000.00	4	Not		

***After Panelists are invited***

After receiving information from the panelists about when they can attend a panel, the Program Director should proceed with the next steps.

***Assign Proposals and Panelists to Panels***

1. To set proposal and panel assignments navigate to the “Assign to Panels” link in the sidebar.



2. You can assign proposals to panels in the resulting form shown below by clicking on a proposal name and then clicking the button representing which panel you want the proposal in. Once the panel button is pressed, the proposal should be listed under the assigned panel.

**National Science Foundation**  
Assign Proposals and Panelists to Panels

Proposals:	Panel 1:	Panel 2:	Panel 3:
1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute	1156372 Playground Equipment Classification and Burn Analysis - Gregory Ford of Worcester Polytechnic Institute	1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute	1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute
1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute		1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute	
1578954 Marketing Worcester Polytechnic Institute at Delphos International - Ross Desmond of Worcester Polytechnic Institute			
1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute			
1784632 Marcellus Shale: Cementing and V...			

Buttons: Assign to Panel 1, Assign to Panel 2, Assign to Panel 3, Assign to Panel 4, **Assign to Panel 5**

3. After proposals have been assigned to panels, you may start assigning panelists to panels in a similar manner. Only the panelists that have marked off they are available for a specific panel will be displayed in the correlating “Available for Panel” boxes to the left. So if a panelist is available for panel 1 and 3 but not 2, that panelist’s name will only appear in “Available for Panel 1” and “Available for Panel 3.” From the list of panelists, you can click a panelists name and the assign button that represents which panel you want to assign them to. You can only assign a panelist to one panel. Check to make sure all panel boxes contain the correct proposals as well as the correct panelists.



<b>Panelists:</b>			
<b>Available for Panel 1:</b>	<b>Panel 1:</b>	<b>Panel 2:</b>	<b>Panel 3:</b>
Lauren Black - Baltimore - Science Justin Debenetto - RPI - Computers Christopher McAndrews - WVU - Aftersc Emily Miner - Boston University - Eleme Maurice Sinner - Georgetown - Space <input type="button" value="Assign to Panel 1"/>	Christopher McAndrews - WVU - Afterschool Education via Clubs Maurice Sinner - Georgetown - Space	Joanne Davis - Arizona State University - Marine Biology	Lauren Black - Baltimore - Science
<b>Available for Panel 2:</b> Joanne Davis - Arizona State University Emily Miner - Boston University - Eleme <input type="button" value="Assign to Panel 2"/>			
<b>Available for Panel 3:</b> Lauren Black - Baltimore - Science Joanne Davis - Arizona State University Casey McNeal - Rice - Math <input type="button" value="Finalize"/>	<input type="button" value="Finalize"/>	<input type="button" value="Finalize"/>	<input type="button" value="Finalize"/>

- Once both panelists and proposals have been assigned, click the red “Finalize” button. Clicking finalize will generate an automated email to each of the panelists that informs them that they are now assigned to a panel and that they should fill out their conflict of interest forms for each proposal. SharePoint will automate a different email to the panelists that were not assigned to a panel saying that they were not selected to be a reviewer.

*Manual Option:*

If a Program Director does not want to use the forms, manual options for the previously described steps are available.

Manual Method: Adding Proposals to Panels Manually

1. Navigate to 'Assign Proposals to Panel' under the 'Manual Update' section of the sidebar
2. This section includes a list of all proposals entered on the site that should be uploaded already by the Program Assistant. To assign the proposals to a panel, click within the 'Panel Assignment' dropdown and enter your selection.

Ⓜ	▼	Proposal Number	▼	Panel Assignment	▼	PI Last Name	▼	PI First Name	▼	Institution	▼	Title	▼
		1245932		1		Amador		Francisco		Worcester Polytechnic Institute		Advanced Patent Application Analysis	
		1875456		2		Acosta		Christian		Worcester Polytechnic Institute		Transit System Analysis and Optimization in Montgomery County	
		1784632		3		Walker		Griffin		Worcester Polytechnic Institute		Marcellus Shale: Cementing and Well Casing Violations	
		1645315		3		Brodeur		Patrick		Worcester Polytechnic Institute		Environmental Compliance: Developing a Database for Waste Oil Monitoring	
		1154886		3		Freyermuth		Jeffrey		Worcester Polytechnic Institute		Cataloging Emergency Response Vessels	
		1187934		2		Davila		Ignacio		Worcester Polytechnic Institute		Improving Workflow at the National Science Foundation	
		1156372		1		Ford		Gregory		Worcester Polytechnic Institute		Playground Equipment Classification and Burn Analysis	
Ⓜ		1578954		2		Desmond		Ross		Worcester Polytechnic Institute		Marketing Worcester Polytechnic Institute at Delphos International	

Manual Method: Adding Panelists to Panels Manually

1. Navigate to ‘Assign Panelists to Panel’ under the ‘Manual Update’ section of the sidebar.
2. This section includes a list of all panelists that have filled out forms. To assign the panelist to a panel click within the “Panel Assignment” dropdown and enter your selection based on the panelist’s marked availability shown to the right of expertise. Picking an Assignment will notify the panelist, and the panelist can proceed to fill out their conflict of interest form.
3. After assigning all panelists click on Panel Tasks in the sidebar and check off “Panelists Finalized” for the appropriate panels.

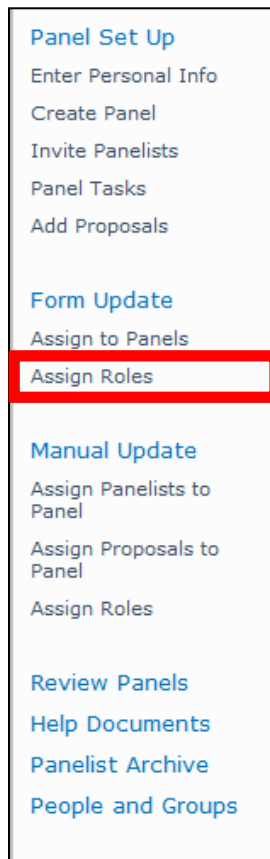
A	Full Name	Panel Assignment	University	E-Mail	Expertise
	Joanne Davis	2	Arizona State University	<a href="mailto:jdavis@au.edu">jdavis@au.edu</a>	Marine Biology
	Maurice Sinner	1	Georgetown	<a href="mailto:spacecowboy@mail.com">spacecowboy@mail.com</a>	Space
	Christopher McAndrews	1	WVU	<a href="mailto:cmcandre@nsf.gov">cmcandre@nsf.gov</a>	Afterschool Education via Clubs
	Lauren Black	3	Baltimore	<a href="mailto:lblack@mail.com">lblack@mail.com</a>	Science
	Casey McNeal	4	Rice	<a href="mailto:cmcneal@mail.com">cmcneal@mail.com</a>	Math
	Justin Debenetto	5	RPI	<a href="mailto:jdebenetto@nashoba.edu">jdebenetto@nashoba.edu</a>	Computers
	Emily Miner	5	Boston University	<a href="mailto:erminer@wpi.edu">erminer@wpi.edu</a>	Elementary Education Research

***After Panelists fill out their conflict of interest***

After receiving information from the panelists about their Conflicts of Interests, the Program Director can proceed with the following steps.

***Assign Panelists to Roles***

1. After receiving the Conflict of Interest forms, you should proceed to the “Assign Roles” link in the sidebar.



2. This opens the following form :

**National Science Foundation**  
**Assign Panelists to Proposals**

**Change Currently Selected Panel**

Panel 1 Panel 2 Panel 3

*Prefers to Review*

Lead Scribe Reviewer1 Reviewer2

*No Preference*

Ian Lukens  
Emily Miner  
Christopher McAndrews

Lead Scribe Reviewer1 Reviewer2

*Prefers Not to Review*

Lead Scribe Reviewer1 Reviewer2

Assignments for Panel 2

Proposal Information:  
1187934 Improving Workflow at the National Science Foundation - Ignacio Davila of Worcester Polytechnic Institute

Lead for Proposal:	# of times Lead
Ian Lukens	3

Scribe for Proposal	# of times Scribe
Emily Miner	3

Reviewer for Proposal	# of times Reviewer
Christopher McAndrews	0

Reviewer for Proposal	# of times Reviewer
	0

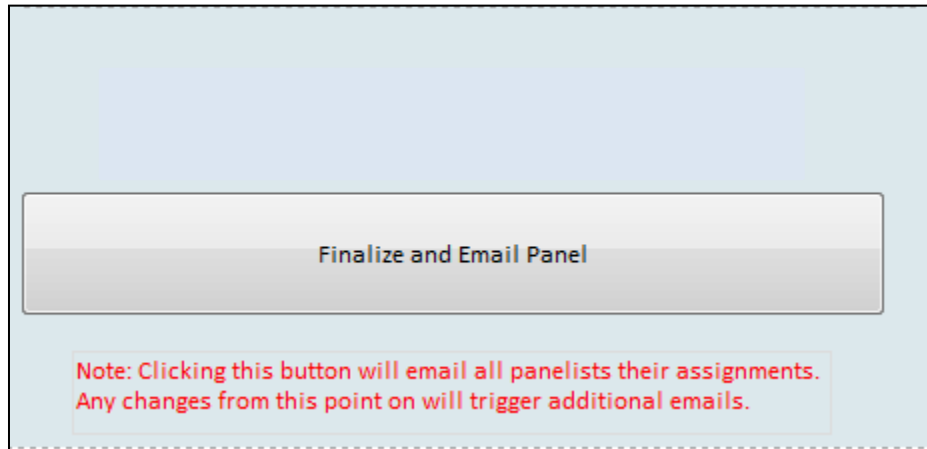
Previous Submit Changes and Close Next

1 of 2

Finalize and Email Panel

This form allows you to assign panelists to different roles by clicking the buttons that are underneath the different lists. Doing so will put the selected panelist into the appropriate field on the right side of the screen and display how many times they were already assigned that role. This count does not include the roles they are assigned to in this screen since until you hit next, the panelist is not officially assigned to the role in the system. If a panelist has a conflict of interest with the proposal being assigned roles, the panelist's name will not appear in any of the lists for this proposal.

3. After all of the proposals have a Lead, a Scribe, and specified number of Reviewers, the following will appear in the bottom right section of the form:



- By clicking 'Finalize and Email Panel,' SharePoint will automate a message to all panelists assigned to the current panel that their role is finalized. The email will also contain a link to the forms, so the panelists may review their roles on each proposal.
4. Sometimes you may need to change a panelist's role. To make the changes, just edit the proper forms, and the SharePoint system will email the panelists affected telling them to review their assignments as a change has occurred.

*Manual Option:*

If a program Director does not want to use the forms, manual options are available.

Manual Method: Assigning Roles

1. Navigate to 'Assign Roles' under the 'Manual Update' section of the sidebar.
2. This section includes a list of all proposals entered on the site. To assign the panelists to the proposals, go to the right side of the page. Each column contains dropdown boxes of every panelist on the site. Select whoever you would like to assign.
3. To email the panelists that their assignment is done, click 'Panel Tasks' in the sidebar and check 'Panelists Finalized' for all panels you would like to notify. Any changes after doing this will send panelists more emails with updates.


Title	Lead	Scribe	Reviewer 1	Reviewer 2
Advanced Patent Application Analysis				
Improving Workflow at the National Science Foundation	Victoria Stratton	Emily Miner		
Transit System Analysis and Optimization in Montgomery County	Ian Lukens	Emily Miner	<input type="text"/>	
Cataloging Emergency Response Vessels	Ian Lukens		Christopher McAndrews Emily Miner	
Playground Equipment Classification and Burn Analysis			Ian Lukens System Account	
Marcellus Shale: Cementing and Well Casing Violations	Emily Miner	Ian Lukens	Victoria Stratton Emily Miner	
Marketing Worcester Polytechnic Institute at Delphos International	Christopher McAndrews	Emily Miner	Ian Lukens	Christopher McAndrews
Environmental Compliance: Developing a Database for Waste Oil Monitoring	Ian Lukens	Emily Miner		

## Useful Features

Below are some useful features of the SharePoint Website.

### Dashboard Section

1. To get to the Administrator Dashboard, click the link titled 'Dashboard' in the top navigation bar.
2. This will open the screen shown below. It has 4 different sub-screens showing a variety of important information. The default screen gives an overview of many aspects of the panel process. The top half includes tasks that must be completed while the bottom part is a breakdown of different elements of the panels with counts of how many panelists are in each stage. Cyan means complete and Red means incomplete.



# National Science Foundation

## Panel Master Dashboard - 11-27-2012

Tasks/Overview
Panelist Status
Proposal Status
Admin Settings
Close

Program Assistant Tasks						
Task	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Percentage
Book Panel Room <a href="#">(Update // Mark Complete)</a>						
FastLane Check <a href="#">(complete)</a>						28.571 %

Program Director Tasks						
Task	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Percentage
Invite Panelists <a href="#">(Invite // Mark Complete)</a>						
Assign Proposals to Panels <a href="#">(Assign to Panels)</a>						100.000 %
Assign Panelists to Panels <a href="#">(Assign to Panels//Mark Complete)</a>						
Assign Roles on Proposals <a href="#">(Assign Roles//Mark Complete)</a>						46.875 %


Panel 1 Overview 11/14/2012					Panel 2 Overview 11/21/2012					Panel 3 Overview 11/21/2012				
	Assignments Complete	Conflicts Marked	Conflicts Pending		Assignments Complete	Conflicts Marked	Conflicts Pending		Assignments Complete	Conflicts Marked	Conflicts Pending			
Panelists - 1	0	1	0	Panelists - 3	1	0	2	Panelists - 1	0	1	0			
	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized		
Proposals - 1	1	1	6	0	Proposals - 2	1	0	3	1	Proposals - 2	0	0	3	0

Panel 4 Overview 11/29/2012					Panel 5 Overview 12/19/2012				
	Assignments Complete	Conflicts Marked	Conflicts Pending		Assignments Complete	Conflicts Marked	Conflicts Pending		
Panelists - 0	0	0	0	Panelists - 0	0	0	0		
	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized	Unassigned Lead	Unassigned Scribe	Unassigned Reviewer	Roles Finalized	
Proposals - 0	0	0	6	0	Proposals - 0	0	0	0	



3. The second screen is the Panelist Status. This screen gives an overview about where each panelist is within the process. It also details the location of each panel. If this is out of date, a Program Director can click the update link and fill in the correct information.


National Science Foundation  
Panel Master Dashboard - 12-04-2012

Tasks/Overview
Panelist Status
Proposal Status
Admin Settings
(Click to Navigate)
Close

Invitation Returns ( 12 invited)

INVITATIONS ACCEPTED: 7	DECLINED 0	ADHOC REVIEW 0	RESPONSE PENDING 9
<div style="background-color: #003366; color: white; padding: 2px; font-size: 0.8em; font-weight: bold;">Panel 1: 5</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Lauren Black</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Maurice Sinner</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Justin Debenetto</div>	<div style="background-color: #003366; color: white; padding: 2px; font-size: 0.8em; font-weight: bold;">Panel 2: 2</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Joanne Davis</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Emily Miner</div>	<div style="background-color: #003366; color: white; padding: 2px; font-size: 0.8em; font-weight: bold;">Panel 3: 3</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Lauren Black</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Casey McNeal</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Joanne Davis</div>	<div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Benjamin Jones</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Jonathan Mustard</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Elizabeth Scarlett</div>

INVITATIONS ACCEPTED

<div style="background-color: #003366; color: white; padding: 2px; font-size: 0.8em; font-weight: bold;">Panel 4: 6</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Lauren Black</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Casey McNeal</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Maurice Sinner</div>	<div style="background-color: #003366; color: white; padding: 2px; font-size: 0.8em; font-weight: bold;">Panel 5: 4</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Casey McNeal</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Joanne Davis</div> <div style="background-color: #e6f2ff; padding: 2px; font-size: 0.8em;">Emily Miner</div>
--	---

[Assign to Panels](#) // [Check Panelist List](#)

Panel 1 on 11/14/2012 to 11/19/2012 with 2 of 9 Expected Panelists in Stafford I, 546 <span style="float: right; font-size: 0.8em; color: #ff0000;">Update</span>		
ASSIGNMENTS COMPLETE 0	CONFLICTS MARKED 1	CONFLICTS PENDING 1
<div style="background-color: #e6f2ff; height: 40px;"></div>	<div style="background-color: #e6f2ff; padding: 2px;">Christopher McAndrews - WVU - Afterschool Education via Clubs</div>	<div style="background-color: #e6f2ff; padding: 2px;">Maurice Sinner - Georgetown - Space</div>

Panel 2 on 11/21/2012 to 11/22/2012 with 1 of 11 Expected Panelists in Stafford II <span style="float: right; font-size: 0.8em; color: #ff0000;">Update</span>		
ASSIGNMENTS COMPLETE 0	CONFLICTS MARKED 0	CONFLICTS PENDING 1
<div style="background-color: #e6f2ff; height: 40px;"></div>	<div style="background-color: #e6f2ff; height: 40px;"></div>	<div style="background-color: #e6f2ff; padding: 2px;">Joanne Davis - Arizona State University - Marine Biology</div>

4. The next screen is the proposal status screen. It details who is assigned to what role within a panel. The top box displays proposals that have not been assigned to a panel. The second box displays the proposals that have panelists assigned to some roles, but other roles are not assigned a panelist yet. The third box displays completed proposals, or those with four reviewers, or the total number of reviewers, assigned. In order to change the panel that is displayed use the dropdown box highlighted below.

The screenshot displays the National Science Foundation Panel Master Dashboard as of 12-07-2012. The dashboard features a navigation bar with tabs for 'Tasks/Overview', 'Panelist Status', 'Proposal Status', and 'Admin Settings', along with a 'Close' button. The main content area is divided into three sections:

- Top Section:** A blue header indicates 'There is/are 1 proposal(s) not assigned to a panel'. Below this, a white box contains the proposal ID '1153684' and title 'Improving Efficiency of Panel Selections - Rob Sato of Worcester Polytechnic Institute'. A link 'Assign to Panels // Check Proposal List' is located below the box.
- Middle Section:** A blue header shows 'Panel: [dropdown] has 1 proposal(s)'. The dropdown menu is highlighted with a red box. Below the header, a summary states: '1 incomplete Proposal(s) with 1 unassigned lead(s), 1 unassigned scribe(s), and 2 unassigned reviewer(s)'. A link 'Assign Panelists to Proposals // Assign in List View' is located below the box.
- Bottom Section:** A blue header indicates '0 Complete Proposal(s)'. Below this is a white box for details, with a link 'Assign Panelists to Proposals // Assign in List View' located below the box.

- The final screen of the Master Dashboard is the Admin Settings screen. This screen has many settings that a user with Administrator access can change. They control when reminder emails get sent out, if ad hoc reviewing is allowed, and if users should be allowed to select 'prefers not to review'.

**\*\*Important:** Changes to these settings will only remain if the "Submit Changes" button is pressed.

**National Science Foundation**  
Panel Master Dashboard - 2012-11-19

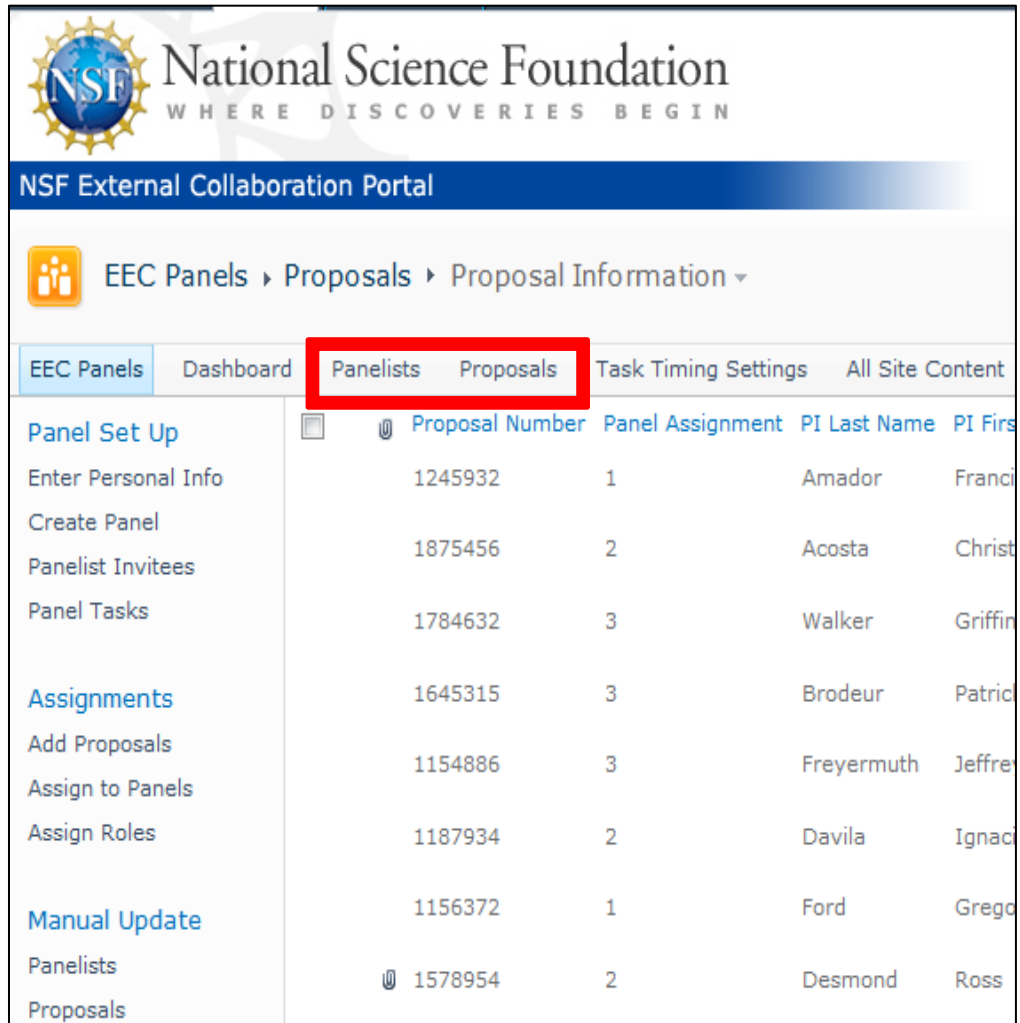
Tasks/Overview | Panelist Status | Proposal Status | **Admin Settings** (Click to Navigate) | Close

Action	Days	Features
Time between reminders to book room for panels	2	Allow adhoc Reviewers <input checked="" type="checkbox"/>
Time between reminders for a panelist to mark availability	2	Allow "prefers not to review" on COI and preferences form <input checked="" type="checkbox"/>
Time between reminders for a panelist to mark conflicts	2	
Time between reminders to invite panelist	7	
Time before panel starts and invite panelist reminder is sent.	93	

Submit Changes

*Alternate View of Panelist or Proposals*

1. To view Panelist or Proposals in list form click on the top bar that indicates the item you want. This will open the view in a list; a sample screen with the top bar highlighted is included below.



The screenshot displays the NSF External Collaboration Portal interface. At the top, the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN" are visible. Below this is a blue header bar with "NSF External Collaboration Portal". A navigation breadcrumb shows "EEC Panels > Proposals > Proposal Information". A secondary navigation bar contains "EEC Panels", "Dashboard", "Panelists", "Proposals", "Task Timing Settings", and "All Site Content". The "Proposals" tab is highlighted with a red box. Below the navigation is a table with columns: "Panel Set Up", "Proposal Number", "Panel Assignment", "PI Last Name", and "PI First Name". The table lists various panel set-up actions and their corresponding proposal numbers and panel assignments.

Panel Set Up	Proposal Number	Panel Assignment	PI Last Name	PI First Name
Enter Personal Info	1245932	1	Amador	Franci
Create Panel	1875456	2	Acosta	Christ
Panelist Invitees	1784632	3	Walker	Griffin
Panel Tasks	1645315	3	Brodeur	Patric
Assignments	1154886	3	Freyermuth	Jeffre
Add Proposals	1187934	2	Davila	Ignaci
Assign to Panels	1156372	1	Ford	Grego
Assign Roles	1156372	1	Ford	Grego
Manual Update	1156372	1	Ford	Grego
Panelists	1578954	2	Desmond	Ross
Proposals				

## Program Assistant Training Manual

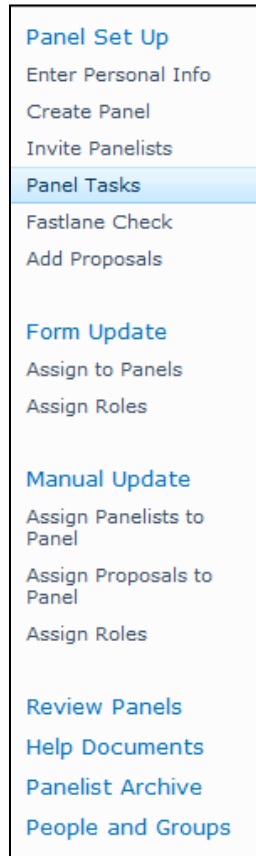
This manual contains a walkthrough of common tasks that a Program Assistant may be expected to complete during the setup of a panel using SharePoint.

### ***Before Panelists are Invited***

Before the panelists are invited the Program Assistant should follow the steps outlined below.

#### *Book the Room*

1. To mark that the room is booked, navigate to the Panel Tasks link in the side bar



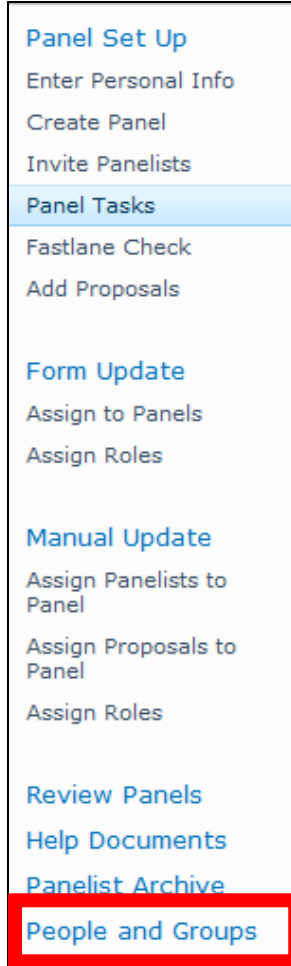
2. Clicking this link will bring you to Panel Tasks page. There are several columns on this page. After booking the panel room, you should check off the “Booked” column for the panel that has been booked for. This will stop the reminder emails that start 6 months before the panel.
3. At this time, you should also fill out the room location and Panel ID in the corresponding columns. The system uses these columns to display information to the panelists.

Panel Number	Start Date	Location	Panel ID	Booked	Panelists Invited	Panelists Finalized	Roles Finalized
Panel 1	11/14/2012 08:30 A		P131454	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Panel 2	11/21/2012 08:30 A	Stafford II		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Panel 3	11/21/2012 08:00 A			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Panel 4	11/29/2012 08:00 A			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Panel 5	12/19/2012 12:00 A			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

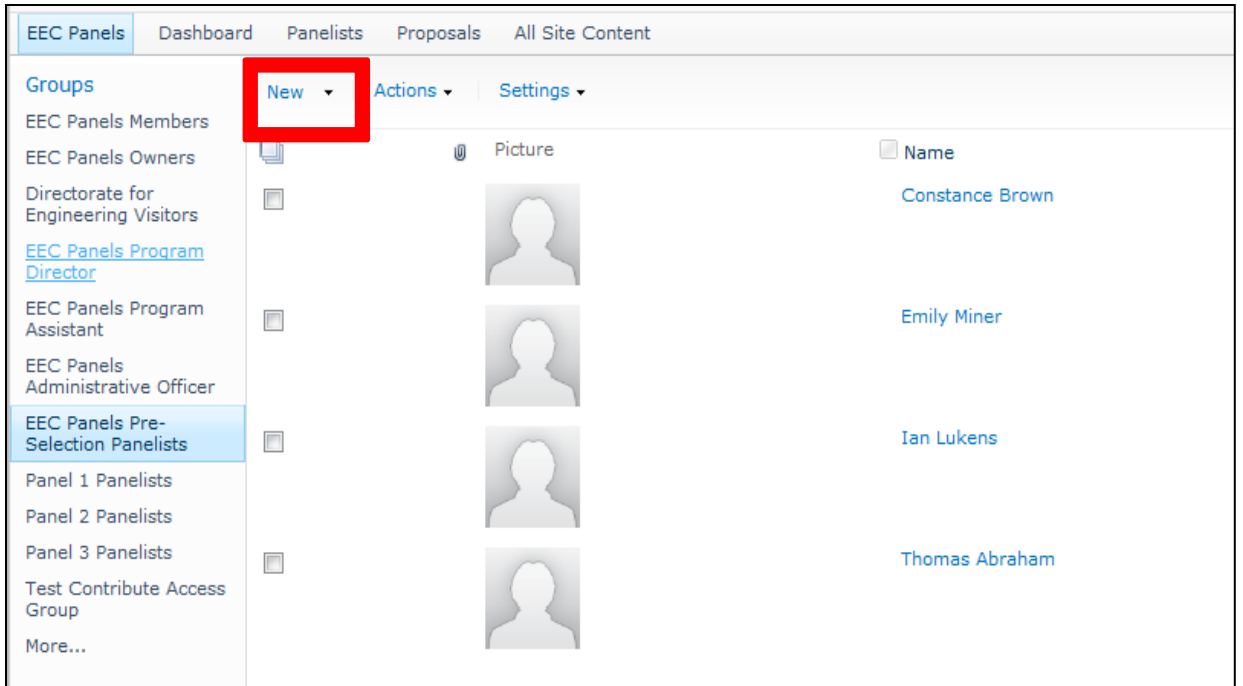
*After Panelists are invited*

*Add Panelists to the Pre-Selection Group*

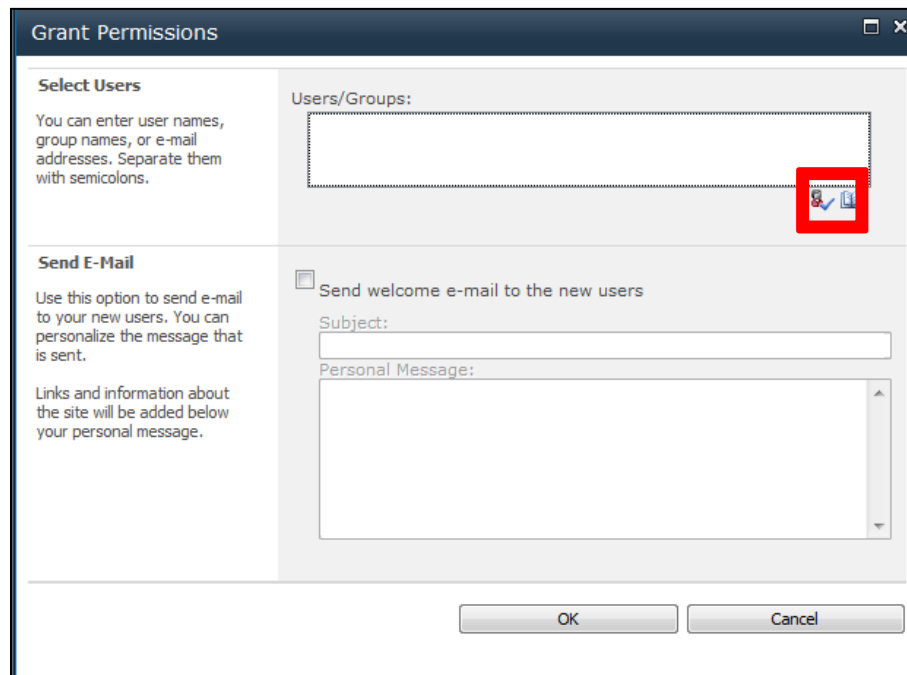
1. To add panelists to the pre selection group, click the People and Groups link in the bottom of the sidebar.



2. This will bring you to the screen below. You can add more people to this list by navigating to the group you want to add to in the sidebar and then by clicking the New button which is highlighted below.



3. Clicking this will open up the following screen. This allows you to add new users by entering in their SharePoint username and then clicking the Check person icon, which is highlighted in red. If you do not know what the username of a panelist is, step 4 has more details. Otherwise, this concludes adding panelists to the group.



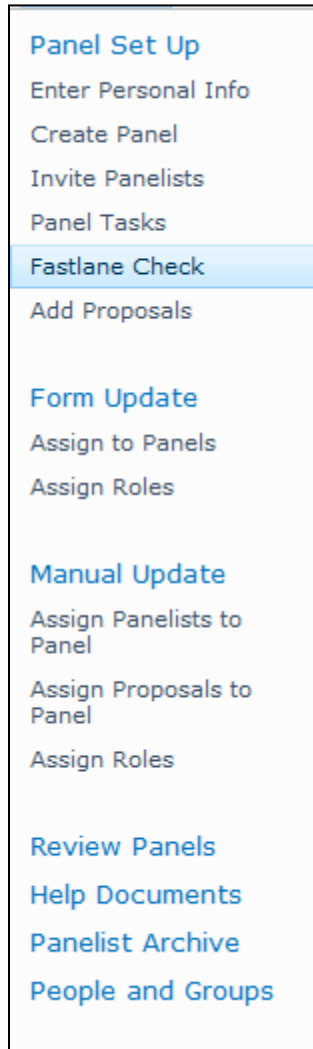
- To find the username of panelists, click on “Invite Panelist” in the sidebar. The screen below will display. The username of all the panelists will be filled in by DIS in the spreadsheet below, highlighted in red.

A	First Name	Last Name	Email	Phone Num	SharePoint Access	Username	Password
	Benjamin	Jones	<a href="mailto:bjones@gmail.com">mailto:bjones@gmail.com</a>	703-292-7107		bjones	Password
	Jonathan	Mustard	<a href="mailto:jmustar@gmail.com">mailto:jmustar@gmail.com</a>	703-292-7107		jmustar	Password1
	Elizabeth	Scarlett	<a href="mailto:Escarlett@gmail.com">mailto:Escarlett@gmail.com</a>	304-820-2991		Escarlett	Pass
	George	Green	<a href="mailto:gg@gmail.com">mailto:gg@gmail.com</a>	8885559999		GreenGreen	P@\$\$w0rd
	Toby	Blue	<a href="mailto:tblue@gmail.com">mailto:tblue@gmail.com</a>	5656564584		tblue	Password
	Joshua	Smith	<a href="mailto:jsmith@gmail.com">mailto:jsmith@gmail.com</a>	1123581321		jsmith	5e
	Marco	Gold	<a href="mailto:Marcogold@gmail.com">mailto:Marcogold@gmail.com</a>	3048869129		jwhite	55
	Jerry	White	<a href="mailto:jerrywhite@gmail.com">mailto:jerrywhite@gmail.com</a>	314152946		igold	word
	Melissa	Indigo	<a href="mailto:mindago@gmail.com">mailto:mindago@gmail.com</a>	8675309205		mind	pass
	chris	McChris	<a href="mailto:cgmccandrews@wpi.edu">cgmccandrews@wpi.edu</a>			CGMANDRE	shoes
	ian	lukens	<a href="mailto:iplukens@wpi.edu">iplukens@wpi.edu</a>			iplukens	shoes
*							



*Check the panelist information matches FastLane*

1. After panelists have been placed in the pre-selection group, navigate to FastLane Check by clicking on the link in the side bar.



2. You will need to check that the information that is entered in SharePoint matches the information for the panelist that is listed in FastLane. After confirming this, check off the box labeled FastLane check.
3. You should also fill out the FastLane Panel Passwords in the column titled Panel Password, for each Panelist at this time.

University	E-Mail	Panel Password	FastLane Check
Howard	<a href="mailto:eric@mail.com">eric@mail.com</a>		<input type="checkbox"/>
Greg	<a href="mailto:Greg@Greg.Greg">Greg@Greg.Greg</a>		<input type="checkbox"/>
www	<a href="mailto:cm@a.com">cm@a.com</a>		<input type="checkbox"/>
WPI	<a href="mailto:ystratto@nsf.gov">ystratto@nsf.gov</a>		<input type="checkbox"/>
WPI	<a href="mailto:ian@botch.com">ian@botch.com</a>	shoes	<input checked="" type="checkbox"/>
Worcester Polytechnic Institute	<a href="mailto:eminer@nsf.gov">eminer@nsf.gov</a>		<input checked="" type="checkbox"/>

**Reset the site after the panels are complete**

1. After the panel is complete many sections of the website need to be deleted to ensure that data confidentiality remains. To delete the sections, just click the box next to the pencil and paper icon and then press the delete button on the keyboard. Delete the contents of the following lists:

<https://extsharepoint.nsf.gov/eng/eec/panels/Lists/Panel%20Dates/Create%20Panels.aspx>

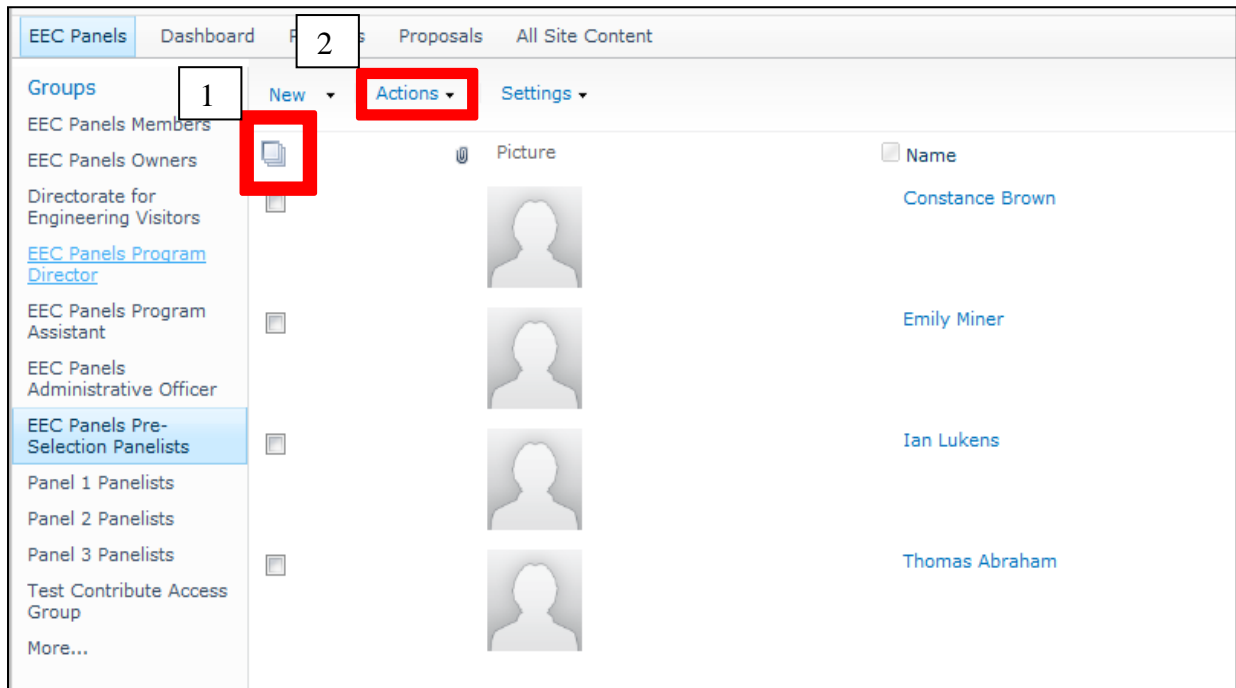
<https://extsharepoint.nsf.gov/eng/eec/panels/Lists/Contact%20Information/Invitee%20List.aspx>

<https://extsharepoint.nsf.gov/eng/eec/panels/EEC%20Panels%20Forms/Forms/AllItems.aspx>

<https://extsharepoint.nsf.gov/eng/eec/panels/Lists/Proposals/Proposal%20Information.aspx>

[https://extsharepoint.nsf.gov/eng/eec/panels/\\_layouts/people.aspx?MembershipGroupId=97](https://extsharepoint.nsf.gov/eng/eec/panels/_layouts/people.aspx?MembershipGroupId=97)

2. To delete all the panelists, first click people and groups in the sidebar. Then click on the box marked “1” and go to the box marked “2” and the dropdown menu should allow for the removal of all items.



3. After deleting the lists a few forms must be reset, they can be found at the following links:

<https://extsharepoint.nsf.gov/eng/eec/panels/Assign%20Panelist%20to%20Proposal/Forms/AllItems.aspx>

<https://extsharepoint.nsf.gov/eng/eec/panels/Assign%20to%20Panels/Forms/AllItems.aspx>

4. After deleting the lists in step 3 click “Add document” in each of the two pages. The Assign to Panels and Assign to Roles forms will then be reset. To make the new forms show up on the site, follow the steps below.
  - a. For the form titled “Assign Panelists to Proposals” simply click on the button titled “Submit Changes and Close” located at the bottom of the form.

**National Science Foundation**  
**Assign Panelists to Proposals**

**Change Currently Selected Panel**

Panel 1 Panel 2 Panel 3

*Prefers to Review*

Lead Scribe Reviewer1 Reviewer2

*No Preference*

Lead Scribe Reviewer1 Reviewer2

Assignments for Panel 1

Proposal Information:

Lead for Proposal:	# of times Lead
<input type="text"/>	0
Scribe for Proposal	# of times Scribe
<input type="text"/>	0
Reviewer for Proposal	# of times Reviewer
<input type="text"/>	0
Reviewer for Proposal	# of times Reviewer
<input type="text"/>	0

Previous **Submit Changes and Close** Next

1 of

- b. For the form titled “Assign Proposals and Panelist to Panels” click the button titled “Submit Changes and Close Form” located at the bottom of the form.

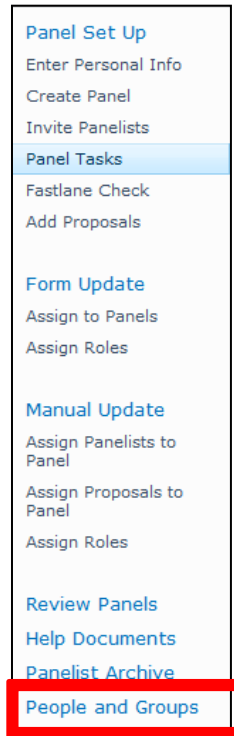
The screenshot shows a web form interface with a dark blue header and footer. The main content area is light blue and contains the following elements:

- Panelists:** A section on the left side.
- Start Assigning Panelists to Panels:** A button located in the left section.
- \*\*\* NOTE:** A red text note below the button: "Only begin using this control after you have finished assigning proposals to panels. Panelists will receive emails informing them of their assigned panel."
- Available for Panel 1:** A large empty white box.
- Available for Panel 2:** A large empty white box.
- Available for Panel 3:** A large empty white box.
- Submit Changes and Close Form:** A button at the bottom center, highlighted with a red rectangular border.

## Miscellaneous

### *Emailing groups*

1. To email groups first you must navigate to the group you want to email. Do this by clicking on the People and Groups link in the side bar.



2. This will bring you to the screen shown below. You can switch between groups with the sidebar on the left. You can email everyone selected in the group by clicking the check all [1] then using the “Actions” Menu [2]

The screenshot displays a web application interface for managing groups. At the top, there is a navigation bar with tabs for 'EEC Panels', 'Dashboard', 'Pa', 'Proposals', and 'All Site Content'. Below this is a sidebar on the left containing a 'Groups' section with a list of group names. The main content area shows a table of group members. The table has columns for 'Picture' and 'Name'. The members listed are Constance Brown, Emily Miner, Ian Lukens, and Thomas Abraham. Red boxes highlight the 'New' and 'Actions' menus in the top navigation bar, and a checkmark icon in the sidebar. The group 'EEC Panels Pre-Selection Panelists' is highlighted in the sidebar.

Group	Picture	Name
EEC Panels Members		
EEC Panels Owners		
Directorate for Engineering Visitors		
EEC Panels Program Director		
EEC Panels Program Assistant		
EEC Panels Administrative Officer		
EEC Panels Pre-Selection Panelists		
Panel 1 Panelists		
Panel 2 Panelists		
Panel 3 Panelists		
Test Contribute Access Group		
More...		

## Panelist Training Manual

This manual is step-by-step directions for filling out the forms for participating in a panel.

### ***Responding to Panelist Invitation***

1. After you have received an email with a link to a form, fill out the form with your personal information. This information will be sent to the Program Director. The email should contain the login information to access the form. This login will open the form shown below called the “Review Panel Invitation Form”. If the form does not open proceed to the section of this manual titled “Navigating the Website” to open the form manually.
2. Fill in your information. The bottom half shows the dates for the panels. Mark whether you are available to serve as a reviewer for any of the panels. After marking “Yes” or “No” for all panel options, the “Submit” button will become available, and you may click it to submit the form. At any time you may save and close the form. If you choose this option, you will periodically get emails reminding you to complete the form.

Note: If you are not available for any of the panel dates, an additional section of screen will become visible. This must be filled out for the “Submit” button to become available. The Program Director will be automatically emailed your response.

National Science Foundation Review Panel Invitation Form			
<b>Personal Information</b>			
First Name:	Last Name:	Phone Number:	E-mail:
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Home Address:		City:	
<input type="text"/>		State:	(if applicable)
<input type="text"/>		Zip Code:	<input type="text"/>
Institution:	Interest:		
<input type="text"/>	<input type="text"/>		
<b>Confirm Availability</b>			
Please check "Yes" for the dates you would be available to serve as a reviewer for an NSF Proposal Review Panel.			
	<b>Start Date</b>	<b>End Date</b>	<b>Available</b>
Panel #1	<input type="text" value="November 14, 2012"/>	<input type="text" value="November 19, 2012"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #2	<input type="text" value="November 21, 2012"/>	<input type="text" value="November 22, 2012"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #3	<input type="text" value="November 21, 2012"/>	<input type="text" value="November 22, 2012"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #4	<input type="text" value="November 29, 2012"/>	<input type="text" value="November 30, 2012"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Panel #5	<input type="text" value="December 19, 2012"/>	<input type="text" value="November 20, 2012"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="button" value="Save and Close"/>		<input type="button" value="Submit"/>	



3. If at any point you see the screen below stating “Access denied”, do not worry. Your information is being considered for a panel that is not finalized. You will receive an email if you were selected to participate on a panel or not.

**Access denied:  
Your form is being processed**




You will be notified by e-mail when further action is needed.

You may close your browser window.

[NSF Division of Engineering Education and Centers](#)

### Conflicts of Interest Form

1. After receiving an email that tells you what panel you have been assigned to, you must review the proposals to determine if you have any conflicts of interests.
2. After reviewing the proposal summaries, you may continue to the form displayed below. In this form you must indicate if you have a conflict of interest with the proposals you have been assigned. In the bottom left hand side of this page, you should mark if you have a conflict of interest with the proposal above by clicking the yes circle. If you are unsure, email the Program Director. On the right hand side you may mark your preferences for reviewing the assigned proposal if you have no conflicts.
3. When you have finished with this proposal, click “Next” to repeat Step 2 with your other assigned proposals.
4. After marking your conflict of interest for every proposal a “Submit” button will appear. Clicking “Submit” will email the Program Director that you have marked your conflicts. At any point you may hit “Save and Close” and come back to this later. If you choose this option you will receive periodic email reminders to finish the form.



## National Science Foundation Review Panel Invitation Form

Please review each proposal's information and verify that you do not have any potential conflicts of interest (COIs) with the university or investigators. If so, please check the COI checkbox for that proposal. Optionally, you may check proposals you would like to/rather not review. Your choice will be considered, although checking a preference is no guarantee of assignment.

If you have any questions about potential conflicts, please email the Program Director at [rchevill@nsf.gov](mailto:rchevill@nsf.gov)

### Review Conflicts of Interest

**Proposal Number:** 1784632

**Proposal Title**  
Marcellus Shale: Cementing and Well Casing Violations

**Institution**  
Worcester Polytechnic Institute

**Principal Investigator Name(s)**  
Griffin Walker

**\*Conflict of Interest?**  
 Yes  No

**Reviewing preference**  
 I'd like to  No preference  I'd rather not

1 of 2

Previous Next

Save and Close

### Reviewing Assignments

1. You will receive another email notifying you that the Program Director has finished finalizing the assigned proposals to each panelist. The link in the email will bring you to the following screen:

The screenshot shows the 'National Science Foundation Panel Invitation Form' with the 'Assignments Review and Approval Section'. At the top left is the NSF logo. A button at the top center reads 'Click Here to List Additional Conflicts of Interest'. Below this, the form displays the following information:

Panel Number	Panel Start Date:	Panel End Date:
3	December 17, 2012	December 18, 2012

**Lead:**

- #1245932 Advanced Patent Application Analysis - Francisco Amador of Worcester Polytechnic Institute
- #1784632 Marcellus Shale: Cementing and Well Casing Violations - Griffin Walker of Worcester Polytechnic Institute
- #1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute

**Scribe:**

- #1245932 Advanced Patent Application Analysis - Francisco Amador of Worcester Polytechnic Institute

**Reviewer:**

- #1645315 Environmental Compliance: Developing a Database for Waste Oil Monitoring - Patrick Brodeur of Worcester Polytechnic Institute
- #1154886 Cataloging Emergency Response Vessels - Jeffrey Freyermuth of Worcester Polytechnic Institute

A red text box contains the following message: "By checking this box you certify that you accept the responsibility of reviewing the above proposals for the National Science Foundation in a timely manner. You are expected to submit your initial review by 2012-12-09."

At the bottom, there is an unchecked checkbox labeled "I accept" and a "Close Form" button.

2. If the "I accept" check box is not visible you may need to wait until the Program Director sends out the email for finalizing proposals.
3. Review your assigned proposals to confirm that there are no conflicts of interest. If you have conflicts click the button at the top to go back and mark the conflicts. This will email the Program Director for you.
4. If you do not have conflicts, click "I accept" and a "Submit" button will appear. Click the "Submit" button. An email will be sent to the Program Director. This will conclude the Panel Invitation Forms. If at any time you wish to review your assignments you may return to this link.

## Navigating the Website

1. The Homepage contains a few useful links in the right-hand side. This links include how to get to FastLane or how to change your password. On the left hand side are links to see NSF Administrators' Contact Information and Panel Dates. There are also links to enter your information for the panel, a link for useful documents that contains travel forms and Conflict of Interest guidelines. These forms, once filled out, can be submitted in the link labeled "Submit Forms Here". Finally, there is the Help Documents link that brings you to a list of all documentation about the SharePoint site.

The screenshot shows the NSF External Collaboration Portal homepage. The header includes the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". Below the header, there is a navigation bar with "EEC Panels" and a search bar. The main content area is titled "Welcome to the EEC Panel Site Homepage" and contains a message: "This SharePoint site will be used to help the panelist review the proposals and write their summary". There are sections for "Useful Tips", "Instructions", "Contact Information", and "Having Computer Problems?". On the right side, there are sections for "Announcements", "Tasks", and "Links".

2. To manually open a form from "My Info," click on the link title name, if there is no form then click add document. Although you can add multiple forms, please refrain from doing so as it makes managing all the forms more difficult.

The screenshot shows the NSF External Collaboration Portal EEC Panels Forms page. The header includes the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". Below the header, there is a navigation bar with "EEC Panels" and "EEC Panels Forms". The main content area is titled "EEC Panels" and contains a table with the following columns: Type, Name, Panel Assignment, First Name, Last Name, and University. The table has one row with the following data: Type (document icon), Name (christopher McAndrews), Panel Assignment (2), First Name (christopher), Last Name (McAndrews), and University (www). There is a red box around the "Add document" link in the table.

Type	Name	Panel Assignment	First Name	Last Name	University
	christopher McAndrews	2	christopher	McAndrews	www

## Summary of Training Sessions

### **Program Director: Dr. Barbara Kenny**

*Thursday, December 6, 2012*

The training session with Dr. Kenny went very well. She told us that she is a fan of training manuals and liked many aspects of ours. The most valuable information we gained from this training session were points of confusing wording and missing information. Many of the steps outlined in the training manual clarified features that we had presented on in the staff demonstration.

Dr. Kenny noted several features that she liked in the system. Since we have been working on the project so long, terminology that we are used to is confusing for those who are reading it for the first time. Dr. Kenny liked that next to each panelist's name was his/her expertise. She said that this particular feature of the system makes the assignments very easy. Also, she likes that you cannot accidentally assign someone to a proposal who has a conflict of interest since the name of the panelist does not show up in the list. She also like that the visual dashboard that shows the panel status.

There were a few features the Dr. Kenny would have liked added. Dr. Kenny would have liked to see a travel section and banking section for each panelist added, but we informed her the due to our limited time at the NSF, we were unable to do so.

#### *Suggestions for Written Training Manual Improvement:*

- Put some of the pictures before the step so that people do not have to search for the reference
- Clarify where the Program Assistant group is and who controls the groups
- The 6 month reminder and 3 month reminder may have to be a bit before hand
- Put in who our DIS contacts are
- A screen shot or description of the tool drop down menu would be helpful
- Clarify what a manual update is
- Explain what each box under the proposal status tab in the dashboard means
- Explain the options for scrolling through the manual spreadsheets
  - Ie) panel numbers, last names of panelists, dates

**Program Assistant: LaTanya Sanders-Peak**

*Tuesday, December 11, 2012*

The training session with Program Assistant LaTanya Sanders-Peak went well. She was able to read through the manual and ask us questions that helped her see the big picture. She wanted to clarify different steps and talk about the possibility of integrating systems.

Peak helped clarify different steps in the manual. She told us that the proposal information is a step that the Program Director takes care of for each of his/her panels. She gets proposal information currently from FastLane and the Program Specialist makes sure that each proposal contains the proper sections and material required to be reviewed. Peak's main concern was the SharePoint system adding more work onto her tasks. She already has to enter and get information from four other different systems, so she is hesitant in using the SharePoint site if it requires her to enter more information into yet another system. We assured her that the main function of the SharePoint site was to store information that the Program Director has rather than create more work for her. We recommended that someone in the division create a contact with DIS so that they can start talking about connecting some of the systems together. {

*Suggestions for Improvement:*

- Clarify that SharePoint will do the Conflict of Interest automatically once the panelists mark off their COIs
- Clarify what FastLane check means
- Clarify that the Program Directors will each have a their own site that the Program Assistant can look at, but each of the sites will be structured the same way

## **Appendix I: Sponsor Description**

The National Science Foundation (NSF) (2012b) is a federally funded, independent agency dedicated to promoting the advancement of science and education. Founded by the US Congress in 1950, the NSF serves to achieve its mission:

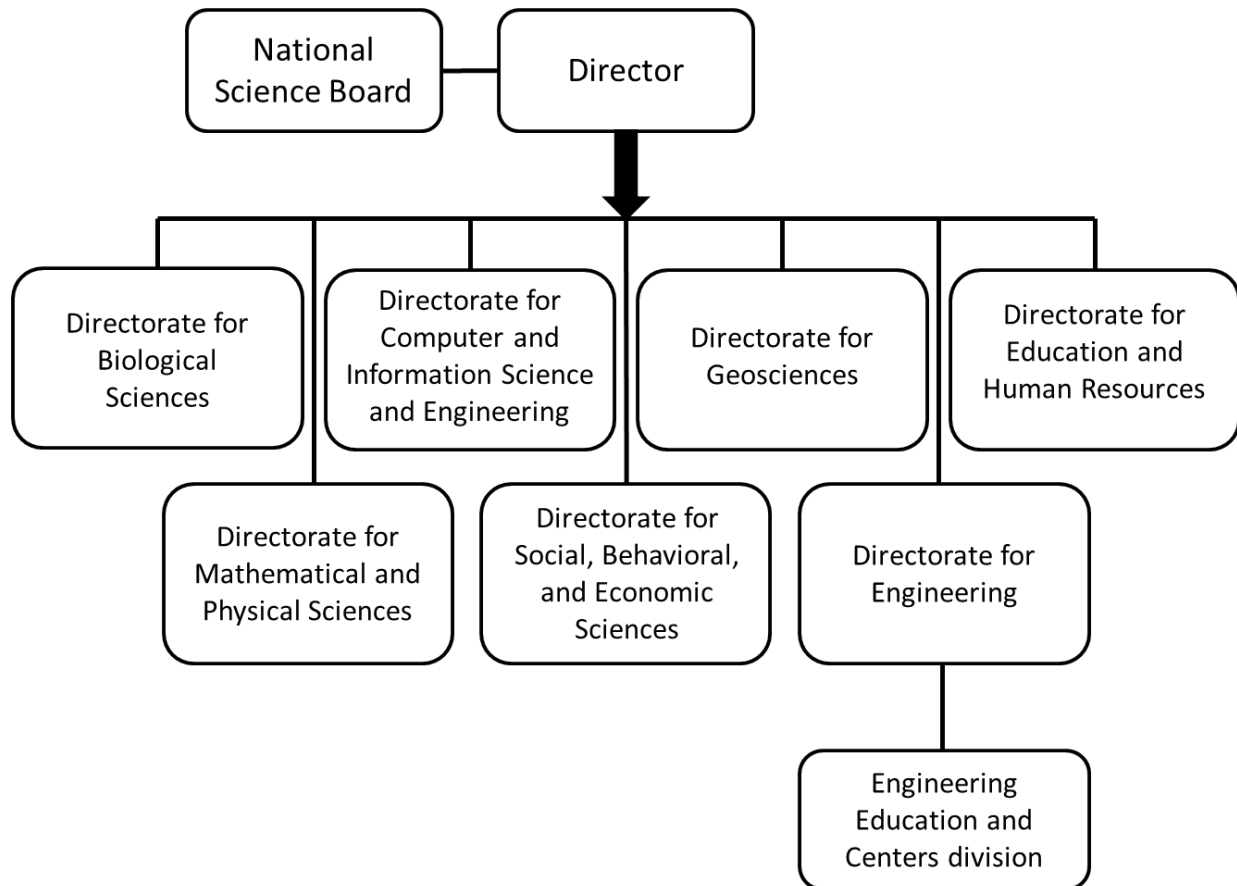
*to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes (p. 3)*

The first portion, “to promote the progress of science” captures the day to day functions of the NSF (2011c) as a government agency responsible for funding cutting-edge research. In addition to the promotion of education and research, the rest of the mission statement supports the first part in that the NSF is dedicated to ensuring that the United States does not fall behind other nations in research.

With the important mission of promoting the United States’ research in science and engineering, the NSF (2011c) needs intelligent and dedicated employees. The fourteen hundred career employees follow the core values of the company: vision, dedication to excellence, learning and growing, broadly inclusive, and accountability. Not only do the career employees follow the core values, but so do the two hundred temporary scientists from research institutions, the four hundred and fifty contract workers, and the staff from the Office of the Inspector General and the National Science Board (National Science Foundation, 2012e). With the core values and mission statement intact, the agency reviews forty-two thousand proposals per year, ten thousand of which they award a three year grant to pursue the research described in the chosen proposal. The research funded by the NSF maintains the agency’s vision to provide global leadership in advancing research and education.

The National Science Foundation (2012e) has two primary forms of leadership. Since October 18, 2010, Subra Suresh has been the Director of the NSF. As Director, he is in charge of

the management of the staff and administration. Aside from the Director, there are twenty-four members on the National Science Board, which establishes the overall policies for the agency. At the end of a board member's or Director's six year term, the United States President, with approval from the United States Senate, appoints a replacement.



**Figure I - 1: Organizational structure of the NSF including the division we are working with**

**(adapted from National Science Foundation, 2012e; Dávila, Davis, Rodríguez, & Ziavras, 2012).**

As depicted in Figure A-1, under the National Science Board and the Director are seven directorates that support science and engineering education and research. These directorates include the biological sciences, the computer and information science and engineering, engineering, geosciences, mathematical and physical sciences, social, behavioral, and economic



sciences, and education and human resources. Each of the seven directorates has its own assistant director to look over the various subdivisions as well as the review process of the project proposals submitted to directorate. Each directorate awards grants to approved proposals submitted by scientists, engineers, and educators all over the nation. The current number of active awards per directorate is 7,114 in the directorate for engineering (National Science Foundation, 2012i), 5,367 in the directorate for geosciences (National Science Foundation, 2012j), 9,907 in the directorate for mathematical and physical sciences (National Science Foundation, 2012l), 3,239 in the directorate for social, behavioral, and economic sciences (National Science Foundation, 2012m), 4,795 in the directorate for education and human resources (National Science Foundation, 2012h), 5,654 in the directorate for biological science (National Science Foundation, 2012f), and 5,817 in the directorate for computer and information science and engineering (National Science Foundation, 2012g). All divisions of NSF support the research that helps achieve their vision.

The National Science Foundation (2011a) receives funds from Congress to continue promoting science and education. Each year the NSF receives an approved budget from the Congress to continue supporting the research in the areas of advanced science and engineering. In 2011-2012 the agency received 7.033 billion dollars from the government to continue the NSF mission. Most of this budget will go to the universities, scientists, and engineers supported by the NSF grants. Since the National Science Foundation (2012e) is the primary Federal agency that supports “high risk, high pay off” research, it is important that this agency continues its work (p.1).

As part of our project, we will be working with the Engineering Education and Centers (EEC) division which is made up of twenty one members. There is a Division Director, Deputy

Director, Program Support Manager, eight Program Directors, five Program Support staff members, and five AAAS Fellows. Of the aforementioned employees, all are involved in the panel selection process except the AAAS Fellows, who work on research projects under the direction of a Program Director. As shown in Figure A-1 below, the EEC is under the Directorate for Engineering (Dávila, Davis, Rodríguez, & Ziavras, 2012). Within the EEC (NSF, 2012n) there are three categories of programs: Center, Engineering Education Research, and Engineering Career Development. The Centers division is made up of the Engineering Research Centers (ERC) program, the Nanoscale Science and Engineering Centers (NSECs), and a Science of Learning Center (SLC). These centers programs support the research, education, development and connecting of technology for partnerships between universities, industry, and government. The Engineering Education Research (EER) programs focuses on funding new engineering pedagogy and methods for teaching in traditional and non-traditional environments. The Engineering Career Development center manages programs such as the Research Experiences for Undergraduates (REU) and Research Experiences for Teachers (RET) which funds research and projects for university students and K-12 teachers to bring STEM related material into K-12 classrooms. Our project specifically focuses on the Engineering Education Research program and how to improve the efficiency of its panel selection process.

The EER accepts proposal submissions twice a year (R. Cheville, personal communication, November 7, 2012). For security reasons, the proposals are submitted through FastLane.gov. Once submitted, the EER Program Director reviews the proposals and brings together panels of anywhere between ten to fifteen experts from universities, industry, foundations, and different professional associations (Dávila, Davis, Rodríguez, & Ziavras, 2012). A Program Director will look at the range of topics of the proposals and will go through their

contacts list looking for experts in that field to be on the panel. While most reviewers have served on a panel before, the EER Program Director tries to bring in at least one first-time reviewer for each panel. The Program Director sends an initial email or calls a potential panelist to see if they are interested in sitting on a panel for that program. The potential panelist will respond back stating if they are interested and the Program Director compiles a list of panelists who are willing to review for the panel. Once the Program Director has enough reviewers, they send the list to their Program Support Staff member who emails the panelists with further directions thirty days prior to the panel date.

The Program Support Staff send out all the information about the panel, following a five-part checklist: creating a panel, obligating funds, communicating with the panelist, preparing for panel day, and procuring reimbursements for the panelists. They are responsible with making sure each panelist has completed the necessary steps to participate in the panel.

Closer to the date of the panel, the Program Director assigns each proposal to at least four panelists for review. When assigning a proposal to a panelist, the Program Director must consider any conflicts of interest by following the NSF Conflicts of Interest manual. If a panelist has a conflict of interest, they cannot contribute or be in the room during the discussion of that proposal. The Program Director assigns a lead reviewer, scribe, and two secondary reviewers to each proposal. All four reviewers should have read the proposal, written a review, and be prepared to discuss the proposal when arriving at the panel. The lead reviewer begins the discussion and the scribe will take detailed notes on the discussion to make into a summary of positives and negatives for the proposal author. As they discuss the proposals, the reviewers rank them to decide which proposals should be recommended for funding. Ultimately, the Program Director makes the final decision about which proposals are funded by the National Science

Foundation. Though the EEC has a checklist, the division still struggles to develop a uniform workflow management system to help organize all the information for each panelist. Following our recommendations the EEC division is able to implement a SharePoint 2010 system that will help to solve some of the present problems.