National Science Foundation
Advisory Committee for Business and Operations
Fall 2022 Meeting Notes
December 12, 2022

Attendees:

Benjamin Brown	Director, Facilities Division, Advanced Scientific Computing Research, U.S. Department of Energy, Office of Science
Shawn Brown	Senior Director of Platform Engineering, HPC and AI Cloud Services, Hewlett Packard Enterprise
Sabrina Ellis	Vice President and Chief Human Resources Officer, New York University
Adam Goldberg	Director and Executive Architect, Department of the Treasury, Office of Financial Innovation and Transformation
Larry Koskinen	Advisor on Enterprise Risk Management, Deloitte; Retired Federal Executive and Risk Management Consultant
Rachel Levinson	Executive Director, National Research Initiatives, Arizona State University
Joe Mitchell	Director of Strategic Initiatives and International Programs, National Academy of Public Administration
Kim Moreland	Associate Vice Chancellor and Director, Research and Sponsored Programs, University of Wisconsin – Madison
Robert Nobles	Vice President for Research Administration, Emory University
Theresa Pardo	Associate Vice President for Research, Special Assistant to the President, University at Albany
Gregory Parham	Senior Advisor, U.S. Department of Agriculture
William Valdez	President, Global Innovation Associates LLC
Pamela Webb (co-chair)	Associate Vice President for Research, University of Minnesota
Maureen Wylie (co-chair)	Federal Chief Financial Officer (retired)

Welcome/Introductions/Previous Recommendations
Co-Chairs: Pamela Webb and Maureen Wylie

Updates to previous recommendations were discussed after the introductions, staffing changes, and COI presentation. For the IT subcommittee, the updates were provided to members in their briefing books. BOAC members Tilak Agerwala, Robert Dixon, Bob Lavigna, and David Mayo were unable to attend the meeting.

BFA Updates-Janis Coughlin-Piester

Coughlin-Piester updated the BOAC on new policies and practices including the Agency's introduction of G-invoicing and application as of October of this year; changes to the Proposal and Awards Policies and Procedures Guide (PAPPG); outreach efforts in a hybrid work environment; and the release of the NSF wide Strategic Plan for 2022-2026. In addition, NSF released its Annual Financial Report with its auditors finding of no significant deficiencies.

Award performance reporting was a main highlight of the updates to previous recommendations. NSF's response to the issue was to establish an implementation team with targeted efforts to bring the organizations into compliance. Project reporting compliance improved as a result, and the top 20 organizations that were noncompliant have since improved significantly. As of this meeting, no grantees had reporting failures that needed to be reported in the Federal Awardee Performance and Integrity Information System (FAPIIS). Wylie expressed how impressed she was by what the NSF Project Reporting Implementation Team (PRIT) has been able to achieve. Wylie noted that due to budget increases, it is important to demonstrate NSF and partners are complying with law and having the reporting necessary to support those new funds.

IRM Updates-Wonzie Gardner

Highlights from the discussion included the results from the most recent Federal Employee Viewpoint Survey (FEVS) in which NSF was ranked second for mid-size federal agencies to work for in the federal government. In addition, NSF's approach and efforts towards the hybrid work environment were noted. Other updates included NSF's implementation of the single login system for all programs, implementation of Controlled Unclassified Information (CUI) programs, creation of agency-wide competency models and revisions to NSF's Collective Bargaining Agreement (CBA) including performance management, student loan repayments, and dispute resolutions. In addition, Research.gov has achieved its top submission rate of 85% of proposals, which indicates that NSF partners are prepared for the upcoming decommissioning of Proposal Preparation and Submission in FastLane. [Note: as of January 25, 2023, Research.gov proposal submissions increased to 95.4%. All proposals are now submitted through Research.gov.]

NSF Budget/OLPA Updates-Caitlyn Fife and Amanda Greenwell

Fife discussed NSF's budget context, the supplemental appropriations and authorizations, current year updates, and FY 2024 planning. Within this presentation, NSF enacted funding levels were discussed to demonstrate the steady growth of the budget but also the variances in percent changes over the years. In addition, Fife highlighted where the American Rescue Plan (ARP) supplemental funding landed in obligations across research and facilities awards and how much of future supplemental funding NSF will gain with the CHIPS and Science Act and the corresponding potential impacts.

In addition, Fife related how NSF continues to align with the Administration's agenda in prioritizing climate-related activities, equity for underserved communities, economic recovery and research security, and emphasis on emerging Industries.

Greenwell and Fife both discussed where we are in the current budget process and what we can expect in the upcoming months. In addition, Greenwell mentioned that the topline numbers may have to come down for the overall budget because of an increase in defense spending that would have to come from non-defense discretionary funding.

Greenwell discussed NSF's Investment Pillars/Strategies including the four cross-cutting priorities that fit well with the White House, Congress, and OMB.

Greenwell also discussed the impact of the Directorate for Technology, Innovation and Partnerships (TIP) and the potential impacts of the CHIPS and Science Act at NSF and the broader community.

Pamela Webb asked what the anticipated impact will be on the TIP directorate if there are significant reductions in appropriations after the budget discussions are concluded. Greenwell indicated that they are aware of this possibility and are responding by doing planning for multiple scenarios.

Knowledge Management (KM) at NSF
Presenter: *Linda Blevins, OD/OIA*
Discussant: *Ben Brown, BOAC, Department of Energy, Office of Science*

Blevins is a Senior Advisor in the Office of Integrative Activities at NSF. She is pioneering the creation of a Knowledge Management (KM) movement across NSF. Linda has experience in other government agencies as well as experience in Program as the Deputy Assistant Director (DAD) of the Engineering Directorate at NSF. This gives her insight into how NSF currently manages knowledge transfer. She is engaging BOAC and requests their feedback and expertise in NSF's approach to this movement.

Blevins outlined the background, leadership approach, and initial findings of leading people and change, and managing knowledge in a complex organization. She wants to know from BOAC what we are doing right and what are our blind spots as an organization. NSF is currently at the beginning of changing the knowledge management process. As she outlined, the current way of doing things-find an expert and ask questions-is not sustainable as the agency grows and changes. The intent of the movement is to identify expertise and knowledge within NSF, make this knowledge accessible across NSF, and ensure knowledge is maintained when NSF staff leave the agency.

KM focus and highlights of presentation:

- Management of knowledge as a strategic asset.
- Encouraging the sharing of knowledge.
- Recipe analogy-the intersection of data, information, and knowledge.
    - The ingredient list-data, how to cook the food-information, when someone comes in and cooks food with recipe-they are applying knowledge. Human context and judgment critical for this to work.
- Current NSF KM and where we need to improve.
    - Current practice-find an expert.
    - Multiple working groups in place, but not a cohesive structure to share what one working group is doing with another-no need to start from scratch. Should be strategically picking up where another group has left off and improve on what exists.
    - Current practice-go to a deputy director. This practice takes away from time doing executive-level of work and is not productive to efficient knowledge sharing and transfer. This is also impacted by the same principle that if you lose people, you lose knowledge.
- Previous focus on KM overall was on software-what we know is that it is more about the people.
- New focus-obtain and maintain knowledge in a more agile way.

    - Reflect and apply the research methodology on ourselves at NSF.
        - Literature review-how it has been done and how it has evolved. Start where others left off and where we can go from there.
    - Create "knowledge brokers" who are neutral parties to move knowledge around the agency.
    - Engage staff and hold ourselves accountable for knowledge and information inside NSF.
- Barriers to overcome
    - NSF staff are busy and don't have a lot of extra time to invest in the process.
    - Knowledge as job security- people value the fact that other people come to them for their expertise.
    - Staff enjoy autonomy in their work processes and working with others on this process feels stifling at times for some individuals.
    - Trust takes time.
- Why NSF needs this now?
    - NSF is growing as an agency.
    - Functions are changing such as the emergence of the TIP directorate.
    - We are now working in a hybrid workplace which creates an environment where we need new tools, practices, and solutions to share the same information.
- NSF is not just making recommendations but leading change in KM.
    - Improving internal policies and sharing knowledge is underway.
    - Over 300 people across the agency are already involved in the movement with a variety of working groups, IT, and senior advisors involved.
    - Adaptive approach-no known solutions, NSF as an agency and the individuals within need to examine competing values and decide what they are willing to give up to get what they want.
- Technology's role in process
    - Get NSF staff excited about deploying tools.
    - KM software available in modules.
        - Load the knowledge artifacts into a system-content management (front).
        - Organize and tag knowledge- taxonomy and ontology (middleware).
        - A way to search for and retrieve knowledge (back).
        - Ways to do all of the three above-find way to stitch them together.
- Main Ideas:
    - Need a comprehensive tool that incorporates semantics, taxonomy and ontology. NSF needs to spend time on the "middle space", in creating the taxonomic and surrounding structures that will allow smart searching that will find what's needed but also generate new knowledge.

Notes on discussion and recommendations
Discussant: Ben Brown

Cultural foundations are a vexing and challenging terrain. Knowledge management can be in everything and nowhere. How we want to be as an organization, down into the weeds-this tool versus that tool. Battling about features. Think about offerings. What are the modalities in stories in lessons learned. Modalities enabled by the work. What happens when someone new comes in versus the experienced staff? How is the sharing and teaching taking place?

- Theresa Pardo:

Pardo was glad to hear that NSF is talking to industry. She recommended that NSF look at the applicable projects that have been funded by NSF itself. Pardo herself had two NSF awards in this category over $1 million. Topics to examine might include:

- Knowledge and distributed intelligence.
- Information sharing and integration.
- Determinants-what makes for a good info and collaborative community? How to build and maintain communities of practice.
- Knowledge of knowledge management and human-to-human technical exchange.
- Examination of academics who have worked in this space already and what sorts of challenges they have experienced (and overcome.)
    - Blevins responded that they are working closely with the Directorate of Social, Behavioral and Economic Sciences (SBE). It was noted by a respondent that it will be important to broaden that collaboration beyond SBE as awards can occur in other directorates (The Directorate for Computer & Information Science & Engineering (CISE) was specifically mentioned).
        - Pardo followed up by saying to broaden collaboration beyond SBE as the awards she referenced were out of CISE.

- Joe Mitchell:

NSF is applying a great strategy. From his experience, cross-functional teams that can work across organizations operate at formal level and yet still allow people to work together informally.

- Inside his own organization, there are similar job descriptions across multiple teams that document knowledge. Even if information is documented and in central system, still going to have to populate at the more specific level. Using the cross-functional teams, operating at formal and informal level. Doesn't mean that as experts are not empowered but will be applying to these circumstances.
    - Blevins Response: her team is connecting people across foundation-creating formal as well as informal teams.

- Larry Koskinen:
    - On NSF's approach to KM- this is a most complete structure and presentation. On a pessimistic note-if there was a watch word-intellectual generosity is insufficient.
    - Investment in practical ways. Taxological and retrieval functions out of knowledge basis. Years ago, Koskinen was in the government position of webmaster. New kind of role here that is defining-that needs to be dignified with career ladder-journalist/reporter. Love to talk about themselves. Appreciative inquiry, remarkable what people give up and share. Capturing and storing in the most appropriate way is powerful.
    - There needs to be a reward of some kind in order to induce enthusiasm.
    - New role emerging-potential of computational linguistics, and the power of well-structured ontology and taxonomy. Stewardship role of how our knowledge fits together.
    - Requires high salary and expertise. How to structure knowledge basis for retrieval-other than brute force addition?
    - Make it easier to put information into system.
    - "Taxonomic steward" needs to be invested in and rewarded well.
    - Focus on know-how, know WHO is more important.
    - New connectivity within organization and out into community-Principal Investigators, etc.

- Can have virtual cup of coffee/beer--build trust relationships to make knowledge sharing as easy as possible.

- Sabrina Ellis:
  - There is a component of psychoanalytic work.
  - Knowledge transfer and management critical.
  - With increase in turnover this work is even more critical.
  - After working in Washington, know well the culture, the people --institutional knowledge important-always a shadow system. A shadow structure-as an outsider can't get arms around.
  - Obstacles-from people standpoint-how are people going to be incentivized.
  - Element to be sensitive to-the emotional part of change management-approach this as psychiatrist-what has reaction been?
    - Blevins response: need quick and easy way to understand KM. But have not rolled it out widely-only at senior level with execs. Not necessarily tested out yet to other audiences.
    - Technical and adaptive challenges as strong model.

  - How are we incentivizing this work?
  - Caution in using psychiatric comparison-psychiatrics not responsible for outcomes but business leaders are.
    - Blevins response: incentive-agency will have to take that on. Will have to figure out what the incentives are. Current incentives in place-Directors' awards, performance evaluations, supervisor talking to employee and saying, "that is great that you did that, who did you tell about it."

    - Gardner response: rewards-we want to fundamentally change the culture. No one place to find out what we are doing. This is so integral to the Foundation. So much out there we learn from each other. Work Blevins is doing- reflect the culture of who we are. Rewards are important but it is more about culture shift of how we use and store information.

- Maureen Wylie:
  - Part of it has to be incentivized between supervisor and employee.
  - There will be variation by fields. As an example, finance and accounting-not filled with extroverts at ease with sharing expertise. Government-wide- we select experts rather than those with KM skills.
  - Experience with documentation-as part of their requirements for the year, that knowledge needs to be transferred and highlight those people as good exemplars.
  - The "Who" knows-more difficult to deal with. Part of the problem is you don't know who to ask. What kind of information do we have employees associate with themselves in the "yellow pages?" How do we know who the experts are? Making it a priority at every level is key.
  - In whatever content management relationship-must be focus on employee--who knows and documenting that.
    - Blevins response: eye opening on where expertise lies in agency. Moves from organization to organization depending on where that employee has moved. Examples-one employee been here for 30 years, different organizations, and a

key function has moved around with her from organizational unit to organizational unit. Couldn't agree more with the points.

- In those organizations that have capacity, if you are moving a key employee somewhere essentially you can create a practice to detail that person back to share before the new work is done. You need to determine who those experts are. Unfortunately, many of those 30+ year employees are gone-retired. Can we reach out to those retired people?
  - Coughlin-Piester response: Not everyone is an extrovert. Excited that there are going to be different modes to capture KM. Incentives but not disincentives to interact.

- Rachel Levinson:
  - Knowledge sharing-there are a lot of people who like being the contact for information. Disincentivizing-different for different people. Doesn't come down to money or makers, it is "how do you find that joy for each person." Classes of that are distinct. Different systems/ontology--- reminds of discussion in human genome project- working on different cultures chromosomes/share. Whether or not commercial implementation-disease-prevention/treatment. Different reward systems to get people to participate.
  - NSF funded research. A system that is infinitely cross-disciplinary needed. This could be beneficial to be shared with STEM community. A lot going through same process. Layers of complexity. If there is a way to reach out and make broader discussion, so larger NSF community-industry and academic institution, it may benefit.

- Pamela Webb:
  - As a general approach people are usually willing to share knowledge; their main challenge is that they need to have the time. Note that NSF budget has grown 24% but NSF workforce gone up 8%.
  - Disincentive for natural flow of interaction, even for people who would normally want to do that. In the university community, the trend is for more and more specialists and fewer generalists. Generalists have historically been the ones who connected the dots.
  - One strategy is to give targeted people the gift of time, and also reward people who are already viewed as cross area experts and generalists to start the ball rolling.
    - Blevins response: in the Office of Integrative Activities (OIA), we call them "eclectic generalists."
- Sabrina Ellis:
  - Lived experience in doing a KM project.
  - Working with the leader who came into the organization and made clear that they wanted systems and tools, change of culture, all that stuff. The employees interpreted that as they want to get rid of us. Result-no knowledge transfer at all, but a fight against the goal.
  - Reason brings up incentive-through whatever incentive-as HR person-can't overstate the notion of communicating value and gratitude to those people have shared that knowledge. Start with the communication of gratitude and bring people in the process as much as possible.
  - Make clear to people they want them to be part of the solution whatever it may look like.
  - Communicate that in the outset-help move forward or disarm people from feeling vulnerable or that their jobs will disappear.

- Maureen Wylie:
    - When evaluating remote/hybrid workforce, how is it working in context of knowledge management? Going to have fluidity in workforce-this ought to be key issue.
    - At the end, we want to value, incentivize, and appreciate people. Don't just hire a government specialist.
    - Those job descriptions become more specialized-need people to reach across organizations. Topics of collaboration between information and financial people if hire more generally across those areas.
    - In government, challenge to bring in generalists that you need to meet the challenges.
        - Gardner response: how do we capture knowledge in distributed workforce, that was already stifled in the environment. Another level of complexity there. What does KM mean by agency, mission, how do we put it together? Not a layer cake, but marble cake. Knowledge held at one level should be shared by all; how do we do that when we don't have normal touch points? The "Nextpert" as we create more-the new individual who understands dynamics in virtual environment and the relationships between the two.

- Larry Koskinen:
    - We don't die when we retire. Create and formalize relationship with retired community. Have time on hands and can bring some wisdom to conversation.

Hybrid Workforce Evaluation
NSF presenters: *Bill Malyszka, OIRM*
Discussant: *Sabrina Ellis, BOAC, NYU*

Malyszka discussed the 2018 agency reform plans and goals to access feasibility of a geographically distributed workforce prior to the pandemic. He reminded the audience that NSF's adaptation towards a virtual workplace has been an idea for a while. Due to the pandemic, prior aspirations towards a hybrid workforce were fast forwarded. NSF partnered with the union, AFGE Local 3403, to establish a new remote and telework policy. On October 24th, 2022, about 60 percent of NSF employees began to telework as supported by their position designation. This transition was effective because it was built into prior policy.

As we return into the building, it is important for employees to be able to be productive and supported coming out the pandemic, especially temporary employees (aka "rotators") who are so important to NSF's culture and business practice. Rotators who worked remotely needed a transition period. This transition period is built into the new policy. This is all important because it is a first step into the future. However, there is a lot of learning to do. There is an evaluation approach for policies and a need to learn how we are supporting the work experience at NSF.

Any corporate organization should have a strategic plan. Technical expertise and relations are important to manage the business. Two important pieces are maintaining culture and core values. We need to examine whether NSF delivers a work experience that helps its staff. We want to maintain our core elements: Diversity, innovation, etc. Equally importantly, we want to deliver for our employees.

NSF will establish our goal to deliver the core elements associated with the research questions, and then monitor results over time. We don't want to experience a retention problem without realizing it. To be preventative, we will utilize a qualitative assessment of employee experience prior to assessment of the metrics and key performance indicators. This will be a long-term approach because we expect employees to fully grasp the experience later.

To attract and retain high quality candidates, we will need to examine our workplace needs and possible research questions.

- Attract: Rotators may look for different schedules than traditional federal employees.
- Develop/Access to Opportunities**:** Is there equable access (Remote versus telework)?
- Retain: Employees have realized the benefits of remote work. How do we provide compelling case for retention? We want to avoid them looking elsewhere.
- Diversity: Do we experience people being impacted inadvertently due to bias? We want to make sure we respond.

We may change our management approach and tune our policy. We want to be able to learn and adapt to remain a high-value employer.

Data on this topic is limited due to people not disclosing sufficient data for demographics. We also have a small population of remote workers, with just a little over 100 staff working remotely full-time. This makes it hard to infer data without digging deeper into the experience. There is a lot of underdeveloped training data that isn't integrated with other human capital data. We are working on having a more composite data and developing a competency model. We have the Federal Employee Viewpoint Survey (FEVS) data but need to dive into qualitative data. We acknowledge that this process is labor intensive and subject to bias.

After presenting information regarding the hybrid workforce, the Committee is asked for their feedback and to answer the established questions:

1. What research questions are critical to NSF understanding the impact of its hybrid work posture on its human capital goals and on its workforce?
2. Has the Committee experienced, or become aware of, barriers to the type of evaluation being planned and/or challenges we should anticipate and mitigate?
    a. What strategies should we employ for making meaningful inferences from data from unavoidably small population sizes?
3. Are the metrics/measures currently proposed appropriate and sufficient to identify changes occurring within the NSF employee population and in the agency's ability to achieve its targeted human capital goals?
    b. At what frequency should evaluation data be collected, analyzed, and reported to leadership?
    c. To what extent, if any, should analyzed date be shared beyond NSF executive leadership team?
4. At what frequency should position designations be reviewed?
5. What strategies should the agency employ to maintain employee engagement in the hybrid work setting?
6. Is the Committee aware of any other agencies or organizations conducting similar evaluations of their hybrid work postures?

d. Are there any organizations we could reach out to for benchmarking, or exemplary cases we could research?

Notes on discussion and recommendations
Discussant: Sabrina Ellis

- Barbara Walker:
  Proposed the question, "How will innovation be measured?"
  - Malyszka response: there is no answer yet.

- Joe Mitchell:
  Joined the conversation by proposing, "What is the impact of the different work modes on performance?" He also suggests that NSF consider creating focus groups to find what Is happening and conduct interviews throughout life cycle, and not just exit interviews. Mitchell then asked, "How are we going to work differently and coordinate?" We don't want people just coming into office and logging in. A major discussion point was employee engagement, especially for new employees who joined NSF during the pandemic. NSF is still seeing mostly empty offices.

- Larry Koskinen:
  Continued the conversation by suggesting that NSF will have a continuing investment with the risk involving the pandemic itself. Koskinen suggested that virtual work is more productive than generative work done face to face. He also proposed that physical work is more expensive than virtual work. He stated that the cost of physical work is now higher due to a public health risk. We tend to not think about that. We need to be able to clearly say what the ROY (return on yield) is when meeting. We need to make sure we have a reason that is so important that we will risk working in person. The question Koskinen presented was, "What is the nature of the work that is worth the investment?" He concluded these thoughts by mentioning that the return to work happened in the context of the pandemic. Not everyone has an identical risk posture.

- Rachel Levinson:
  Added to the discussion by addressing how she is in favor of people meeting with stakeholders in person. She believes in person discussions are very valuable. Her suggestion is that it is important to ask staff how important it is to them to be able to go in and meet with people.

- Maureen Wylie:
  Suggested that NSF will not be able to separate in-person and virtual/remote work. She proposes that all questions cannot be answered by just looking at the workforce. Her suggestion is that NSF needs to be able to assess the quality of the work completed, not just the impact of the type of work on the employee.

- Shawn Brown:
  Suggested that there are a lot of benefits to a hybrid workforce. He claimed that it is of more benefit to work fully remote unless staff need to come in for long events or interactions. He

suggested that coming in a few times a pay period doesn't hold much value. A better approach would be to come in with a targeted approach.

- Adam Goldberg:
  Suggested having people come in one day a week, although there is some risk of dissatisfaction and non-compliance. He also suggested that there needs to be a consideration from the customer or sponsor. Goldberg proposed question was, "Are people getting what they are expecting from NSF given the new workplace arrangement?"

Malyszka added to the conversation by suggesting NSF should be invested in team norming. His suggestion is that NSF should be establishing shared accountability of collaboration and innovation. His proposed question was, "Are we able to deliver against the value of being in person?"

- Kim Moreland:
  Suggestion is for NSF is to publish all data and research found because data surrounding this topic is so new. Moreland claimed that there is resentment that people are not being respected in their views in how they work best. The need for engagement and sense of community has been lost. Social isolation has occurred and makes comradery hard. People are in their office working with their doors closed. We need to connect with people who are not in the office.

- Larry Koskinen:
  Added that organizations don't collaborate, individuals who trust each other collaborate. We bring people together purposefully to bounce ideas around and this Is missing in the conversation and in the work we do.

- Shawn Brown:
  Suggests that productivity and wellbeing should be measured closely. Both variables should be measured due to a propensity for burnout. We need to make sure people are not taking a three-hour commute for working three hours a day. An important observation to note is that the younger generation expects to work more from home.

- Maureen Wylie:
  Questions were, "How do you check in with new employees? Focus groups? How do you feel about trust relationships?" More experienced staff know that the trust is built up over time and have that trust to build upon. She indicated that as relationships between newer staff develop and the trust baseline within their workplace withers, then we will have problems. Wylie's suggestion is to utilize focus groups, and include an age cohort or tenure in agency, or mixed and separate groups. Her ultimate suggestion was to ensure there is data collection and evaluation.

- Pamela Webb:
  Suggested that we should not ignore retention. NSF should not be spending a lot of time to get the next person up to speed because without it, this will not allow for good collaboration to develop. Webb's opinion is that employees are supposed to work where they do their best work. In her workplace, 90 percent of her staff chose remote work, compared to only one

person who decided to work in the office. She also has a lot of staff who have young kids. Webb's major input was that employees should choose what works for life satisfaction.

- Sabrina Ellis:
  Shared that NYU has entire departments that have frequent turnover.

Malyszka added that employees struggle the most traveling within their agency. It gets harder to navigate the further away they sit from their division.

The discussion concluded with the thoughts of Koskinen. He stated to the panel to ask how many people are willing to badge in and then go home -- that is a real trust moment. We need to take this potential problem seriously.

Subcommittee on NSF's Information Technology and Enterprise Architecture
NSF Presenter and Discussant: *Shawn Brown, BOAC Hewlett Packard Enterprise*

BOAC's role is to review the report and recommendation and after discussion, will be asked to vote to accept, reject, or send back for revisions. There were five groups of recommendations (presented by the subcommittee members named):

Recommendation Group 1: IT Supporting a Modern Workforce

Lee Cheatham

- The reason for this recommendation is to ensure management systems include the needs of the entire NSF workforce.
- Making sure that custom implementations are focused on things truly unique to NSF.
- There needs to be broad accessibility. Making sure access is appropriate for employee level is key.
- There are a lot of hidden costs of building custom systems yourself.

Recommendation Group 2: Enabling External Stakeholders

Suzette Kent

- Throughout the IT plan, there are multiple elements to help spur innovation and move more quickly with external stakeholders.
- Using commercial off the shelf systems will help exchange data faster and set metrics, ideas, and dialogue.

Recommendation Group 3: Responding to Changing Mission Priorities

Shawn Brown

- Need to maintain a clear understanding of key resources.
- Build and maintain a central dashboard for key metrics for all key IT initiatives and post a high-level annual summary on NSF's public website.
- Align the organization to sustain a highly resilient operating environment.

- Use automation tools to help solve the documentation/transparency problem. Develop and track clear, documented, and dynamic metrics/Key Performance Indicators (KPIs).

Recommendation Group 4: Investing in Data and Artificial Intelligence (AI)

Viji Krishnamurthy

- Strategic: We would like the NSF to develop overarching AI that is trustworthy, usable, and expandable. Have KPIs to evaluate based on the metrics.
- Tactical: Training of the workforce on AI --prioritize the AI and data first for maximum workforce results. Recommends to transforming all employees to data consumers. Everyone must have easy access to data to take advantage of the power it represents. Also recommends standardizing AI development -- AI is collaborative and not a single task to do and the product will grow into something better over time.

Recommendation Group 5: IT Excellence

Ron Bewtra

- The Microsoft Teams application as fielded at NSF does not work as well as it should compared to those outside government organizations. We need NSF to focus on minimal sets of services that are secure and have the strong user experiences we need. They need to be publicized and stakeholders need to know when they will be available.
- Zero Trust Architecture is a decade old but underutilized. It is the best cyber approach-- NSF needs to use it, not just because of OMB requirements. We need to have a strong sense of users (identity management). All interactions should be authenticated and monitored all the time. This will be a difficult transition. Will require NSF to know where and what their data collaborations are. These need to be strategies that are made public so that outside stakeholders will understand their responsibilities.

BOAC continues with a discussion about the five recommendations.

- Pamela Webb:

Began the discussion by asking, “What does it mean for requirements of AI?”

- Krishnamurthy response: it helps to set goals for NSF and the entire research community in terms of how AI is developed. This is how NSF is doing AI internally, and this will be an example for the research community to see and observe from an expert who coordinates to what the executive orders says.

- Theresa Pardo:

Referred to recommendation four and was curious about AI. She asked:

- Is the assumption that all these principles will be required inside NSF?
- What does it mean to convert principles into decision-making frameworks?

- How do we translate ethical principles into tools or techniques that constrain the development process? It is important to mention that there are not sufficient tools to impact technologies within different contexts.
- What are the guiding principles in coming up with metrics or tools that inform our determinations about impact?
- How to separate AI scaling from data-driven upscaling? We need data consumers separate.

Pardo recommended having AI training and data training done separately.

- Krishnamurthy response: agreed with Pardoe. She stated the primary goal should be that everyone is a data consumer. Krishnamurthy then recommended forming a committee that meets on a regular basis and makes the AI program as an informant thing. Build on it during the quarterly review meetings. There are so many AI intersections. It is difficult to have complete and comprehensive delivery from the get-go.

- Larry Koskinen

Joined the discussion by introducing human capital risks, and the audit issues associated with broader data access that he suggests must be managed. He asked, "Are you prepared to come to grips with the hard work?"

- Gardner response: we are prepared and we are working with IT to figure out how.

- Dorothy Aronson (Chief Information Officer) response: Dan Hofherr (Chief Information Security Officer) has responsibility for IT security. She stated that there is a whole segment of IT workers who continuously review our investments and constantly audit, and they depend on BFA's audit approach.

- Kent response: acknowledged that not all risk is risky.

Koskinen agreed and added that NSF as a leader is impatient. He suggested that we don't put ourselves behind by being afraid to fail.

RECOMMENDATION: BOAC subcommittee voted and accepted all recommendations.

Meeting with Karen Marrongelle (Chief Operating Officer) and Teresa Grancorvitz (Deputy Chief Operating Officer)

The meeting with the COO and Deputy COO began with an introduction led by co-chair Pamela Webb. The goal of the meeting was to share meeting notes and discussion. BFA and OIRM updates were summarized, and then the BOAC committee was introduced.

Dr. Karen Marrongelle, who has been the COO for a year, stated that she is glad that Linda Blevins spoke earlier about Knowledge Management. It is important to organize knowledge in an efficient way. We don't have good methods to encapsulate new knowledge and this has been an issue. Marrongelle stated

that hybrid work is exciting because we can be online and do innovative work. She thanked everyone on the BOAC for their advice.

Ben Brown presented the summary on Knowledge Management:

Brown noted that it is hard to approach this topic in a structured way. He introduced the four main themes, that included adopting an adaptive mindset, and what BOAC encourages to promote knowledge within subunits.

The BOAC encourages:

- Necessary change leadership: make diffusing of information intentional throughout the whole organization. Real investments in time and systems are required. Pay attention to diversity and inclusion, introverts who express key knowledge and diversity of incentives.
- Novel ideas: testing for aptitudes. Encourage internal journalists. Create visual new roles. Consider network mapping. Formalize relationships with recently separated staff.
- Value propositions are aligned to managers of the workforce. Return on Yield, what are the early wins and how can they be done in a sustained way. Risk management will be mitigated across attrition.
- Opportunity for early wins. “I found the person I needed to help me with xyz”.

Sabrina Ellis presented the summary on Hybrid Workforce Evaluation:

- Ellis noted that it is important to attract the best possible workforce.
- Research points towards in person presence which leads to better outcomes.
- Group deserves work be published so that everyone can benefit.
- Different leaders have different preferences. Different employees have different lifestyles.
- Quality of work coming back to the office. Are people coming back just to sit on Zoom meetings? Or are people driving for hours just to sit in front of a computer? Need to ensure that in person work is focused and adds value.

Shawn Brown presented the summary on the Subcommittee on NSF's IT/EA Recommendations:

- The NSF IT infrastructure is complex. Investing data in AI; upscaling NSF workforce. What does this mean? Do we just need AI programmers? No, it is also about data analytics and data work. Not everyone needs to work with AI.
- IT excellence, security, Zero Trust Architecture. A lot of thought needs to go into these concepts and the structure. Focused on different levels of AI; ethics, training the workforce, procedures for sharing AI data. AI has become mature enough that we use AI to organize analytics, metrics, KPIs, and data. AI lets us measure far more complex metrics. Larry Koskinen brought up that we have not talked about the investment part of AI. The IT is not funded to do all of what is needed for IT at NSF which creates complicated space for IT to manage all needs in all directions. A lot of risks need to be mitigated in IT.
- Gardner confirmed risk was discussed in other meetings but agrees it does need more attention.
- Subcommittee recommendations were accepted by the BOAC.