Best Practices for Succession Planning in Federal Government STEMM Positions

By Gina Scott Ligon, JoDee Friedly, and Victoria Kennel

The Need to Focus on the Development of STEMM Human Capital: Four Drivers

The federal government's talent pool in science, technology, engineering, math, and medicine (STEMM) positions is drawing increased attention due to the importance of these positions and the need to recruit, retain, and develop highly qualified individuals to serve in federal scientific agencies. While the need for STEMM succession planning is clear, there has been insufficient action on this challenge. It requires a great deal of forethought, planning, and adaptability, given the rapid changes and budget cuts faced by agencies.

Further, turnover of senior-level political appointees often stifles senior-level leadership support and accountability for succession planning efforts. Chris Mihm, managing director for strategic issues at the U.S. Government Accountability Office (GAO), says, "Political leadership comes to Washington to execute a policy and a program agenda," but they must "expand their time horizon and think about, and understand, the importance of fundamental management." Julie Brill, manager for training and executive development at the Office of Personnel Management, states that, "It's important to do succession management now." A series of forces now require increased focus on succession planning by federal agencies. These include:

- Driver One: The dramatic increase in members of the "baby boom" generation (those born in 1946–1964) eligible for retirement presents a significant need for succession management.

- Driver Two: Given budget cuts and sequestration, agencies are leaving positions vacant at many organizational levels.

- Driver Three: There are proportionately fewer new graduates entering the federal workforce than there are entering the private sector.

- Driver Four: Turnover is inherently built in at the top.

"A chief scientist at NASA cannot just be a leader. He/she must be a world-renowned scientist and a leader of other world-renowned scientists. The pool for succession planning for these people is not the same as it is for leaders in other positions or general management; succession planning for scientific and technical leaders requires intentional planning and opportunities, as well as ensuring there are cultural norms in place about scientific succession planning."

– Jeri L. Buchholz,
Chief Human Capital Officer, National Aeronautics and Space Administration

As a result, the cumulative impact of generational trends, such as government employment boosts in the 1970s, federal downsizing in the 1990s after the Cold War, and lack of recruitment of the millennial generation, have created a need for strategic and effective succession management.

Four Challenges to STEMM Recruitment and Succession Planning

Recent reports on the future of STEMM positions suggest that the pipeline is leaky at best. While task forces assemble to address the need for early education, college training, and early career entry for bench positions that will emerge in the next 10 years, planning who will lead individuals in these positions, particularly in mission-critical government positions, poses four major challenges.

- **Challenge One: STEMM talent is difficult to recruit to the federal government.** STEMM workers are highly specialized in their domains (e.g., agriculture, engineering), and such expertise requires a great deal of training and experience to develop. These specialized positions are also the very ones that are mission-critical. For example, in 2014 the Nuclear Regulatory Commission intends to hire 280 individuals in the

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GS-0800 (engineering and architecture) and GS-1300 (physical sciences group) "job families" at entry and mid-levels in the organization. As of 2014, federal employees in these "job families" also have differentially higher pay scales than other "job families" have, to reflect demand across the public and private sectors. It is unclear, however, if the pay differential will be enough to compete against that offered in the private sector. Across federal agencies, there is a demand for top STEMM employees to lead innovative research and project implementation.

- **Challenge Two: Federal agencies must retain leaders and create a pipeline for current employees to gain the knowledge needed to lead STEMM positions.** The importance of leaders is underlined by the OPM retirement/turnover projections that more than 50 percent of the 7,746 senior executives will either leave or retire from their government positions by the end of 2015. The GAO also estimates that 70 percent of senior executives are currently eligible to retire. The key scientific and technical, organizational, and field-level expertise that these top leaders will take with them highlights the need for agencies to invest resources in effective succession planning.

- **Challenge Three: There is significant competition from the private sector for these STEMM leaders.** In a recent study of Fortune 1000 companies that focused on recruiting and developing STEMM leaders in the private sector, Bayer USA found that 99 percent of the companies surveyed offered programs geared at recruiting and retaining qualified STEMM professionals during and immediately after college. The private sector is working hard today to recruit STEMM employees, and has more tools available for recruiting than the federal government does. These include internships, tailored STEMM recruiting, mentoring, summer employment, and scholarship programs. The federal government is now working to add these tools to their recruitment portfolio for STEMM candidates.

- **Challenge Four:** In rapidly changing fields where STEMM positions are housed, succession plans that merely target "continuity of leadership" are not sufficient. The Corporate Leadership Council (2012) reports that best practices in rapidly changing industries require

succession planning that can not only backfill vacant positions for continuity, but also fill new positions which can serve multiple or cross-functional roles in a changing organization. In these organizations, leadership bench strength is defined not only by an organization's capacity for continuity of operations, but also by the flexibility to define new roles and respond to change within roles.

How STEMM Work Differs from Other Work in the Federal Government

The Nature of STEMM Work

The nature of STEMM work requires a tolerance for ambiguity and complexity. STEMM positions require people to work with problems that are ill-defined, unstructured, and afford multiple pathways for generating novel, useful products and services. Some of the activities associated with these ill-defined problems span two separate but related activities— idea generation and solution implementation.

- **Idea generation** involves problem finding, information gathering, idea formation, and conceptual combination.

- **Solution implementation** includes idea evaluation, revision, and solution monitoring. In the federal government, these activities have another layer in that they are required to produce products (e.g., vaccines), services (e.g., technical platforms for grant idea development such as those found at the National Science Foundation), and social structures (e.g., interdisciplinary research teams found at the Centers for Disease Control and Prevention to respond to epidemics) that are valued as novel and useful to a wide variety of stakeholders in a highly visible way.

Another difference in STEMM positions versus other types of positions is the focus on science and technology—sometimes in lieu of the human capital—of these innovative efforts. At no time was this clearer than when Jeri Buchholz came on board as the chief human capital officer at NASA. "We were great at highlighting the innovative products at NASA. I remember a promotional video we made where an entire space station was shown coming together on its own in space. The bolts were magically floating to their places, the panels were affixed on their own. I remember thinking to myself, 'Where are the scientists and engineers who built this?'"

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Scientific Work in the Federal Government

This context for scientific and technical innovation yields at least five observations about the requirements for individuals engaging in such work in the federal government.

First, creative work requires the active generation and identification of ideas to solve complex problems in a particular domain, and these cognitive or "thinking work" activities require substantial amounts of technical "bench" knowledge. For example, the Office of Naval Research requires that its leaders develop this expertise by working five to 20 years in federal laboratories before joining ONR as a program manager. This results in STEMM workers at ONR having sufficient technical, process, and scientific expertise to know how to evaluate the innovative contributions of others. This also greatly reduces the pool of candidates for a succession plan. "There are only so many people who even have degrees in nanotechnology. When you think through how long it takes to develop expertise in that field, you have a much smaller talent pool than you have for other positions in management," says Jeri Buchholz.

Second, because the nature of STEMM-related problems addressed in the federal government can be ill-defined and complex, solving them creatively requires multiple types of expertise in addition to domain-specific STEMM knowledge. This issue is an important one; the context for innovation in the federal government demands collaboration among multiple types of experts, agencies, and stakeholders. Thus, for scientists to assume leadership positions as they advance in a career, they must have significant credibility with diverse constituencies and be able to foster effective collaboration among them.

Third, innovation in STEMM work is uncertain and resource-intensive. Given today's fiscal climate and sequestration, engaging in risky, expensive endeavors can be challenging at best. Groups of people devote time, effort, infrastructure, and other monetary resources during the idea development and implementation stages of innovation, and often these investments are met with unexpected time complications and setbacks. Given the turbulent fiscal context in which the federal government

currently operates, scientific innovation leaders must be skilled at politically managing such uncertainty in dealings with stakeholders. One effective way STEMM leaders do this is through confident strategy formation during meetings and press briefings, even while faced with internal uncertainty about outcomes. An implication of this is that STEMM leaders need to project confidence to others, even when the leader may feel less certain about outcomes due to ambiguity inherent in the federal work environment.

Fourth, STEMM positions require creative people to execute them. There is a large body of research that profiles these unique individuals. One characteristic they share is significant domain expertise, developed after years and hours of intense, focused practice. To persist at this type of expertise development, creative individuals often have high levels of intrinsic motivation for the nature of the work itself (rather than the organization requiring the work or the people collaborating about the work). While this helps them focus on developing tremendous expertise along the way, it also can interfere with such individuals paying adequate attention to relationship maintenance, both internal and external to the organization.

Fifth, the need for creative people has at least two implications for leaders of STEMM workers.
- A STEMM leader, charged with managing such a unique workforce, should be skilled at fostering collaboration between diverse experts who often have limited motivation to work together.

- Because creative individuals have such high levels of intrinsic motivation to develop more domain expertise in a given area, any effort geared to develop them (e.g., succession planning) should be explicitly tied to accruing greater knowledge and skills related to the work. In other words, attempting to motivate a creative individual to engage in a succession plan's activities for the good of the organization will be more challenging for STEMM succession strategies than it is for other types of emerging leaders.

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Characteristics of STEMM Leaders

Given that the nature of STEMM work is complex, costly, uncertain, and resource-intensive, it takes a certain type of individual to lead STEMM workers in the federal government. In our own research and that of others, we have identified a key differentiator between STEMM leaders and other types of leaders—the requisite expertise they need to evaluate the technical work of others. For example, program managers at ONR spend 10 to 20 years as bench scientists in one of the Navy labs before coming to the headquarters in Arlington. "This initial scientific training builds credibility that is needed to lead portfolios of scientific projects later in their career," says Craig Hughes, Deputy Director of Research at ONR.

Another key differentiator for STEMM leaders is the high level of involvement they should play in succession planning initiatives. For example, current STEMM leaders possess the field expertise needed to guide human capital experts in identifying emerging technologies and disciplines. They also should direct succession planners' recruiting efforts, as they have more knowledge of research advances at universities where core skills are developed. For example, HR was recently decentralized to work with various technical directorates at the Department of Health and Human Services to partner more closely with scientists on human capital processes in their areas of expertise.

The partnership between STEMM leaders and human capital staff happens at each phase of the succession planning process. This partnership model for succession planning separates important roles for each party in planning for emerging leader transitions and long-term human capital strategy.

Given the rapidly changing nature of STEMM work, coupled with the small pool from which to draw STEMM leaders, this report argues:

- It is important to intentionally and proactively design succession planning for STEMM leaders. These leaders are difficult to find and cannot be grown overnight.

- Second, while there is much literature about succession planning in general, succession planning for STEMM leaders requires adjustments to the current government process.

- Third, because scientific work requires a unique organi-

zational context and leaders when compared with other positions in the federal government, agencies need to share best practices and learn from each other.

The next section of the report describes six steps in succession planning, and provides specific roles and responsibilities for both human capital staff and STEMM leadership. Best practices identified in STEMM succession planning include the following six steps:

- **Step One:** Strategy formulation for succession planning

- **Step Two:** Identification and selection of leadership candidates

- **Step Three:** Development of individuals

- **Step Four:** Tracking and validation of individual development

- **Step Five:** Placement into leadership positions

- **Step Six:** Evaluation of succession planning

The final section of the report offers two key recommendations on STEMM succession planning, as well as future directions for research and practitioners.

Recommendation One: Agencies should not have to reinvent the succession planning wheel. Instead, they should borrow best practices from other agencies and customize procedures to meet their unique needs. Cross-agency collaboration also fosters opportunities to learn from and develop proven development activities. A report published by the IBM Center for The Business of Government, *Implementing Cross-Agency Collaboration: A Guide for Federal Managers,* offers a variety of examples that use cross-agency programs and initiatives to improve communication lines and streamline practices. Agencies must also take advantage of the wealth of leadership succession planning resources and support provided by OPM.

There is great benefit to networking via borrowing succession planning programs. Our hope is that this report will assist agencies in sharing best practices that will facilitate this across the federal government. Agencies can build internal and external knowledge by partnering with other organizations or departments whose programs can be implemented

in the second agency's specific area. This creates a more government-wide workforce by building connections between people who would not normally interact.

Recommendation Two: Agencies should capitalize on mentoring relationships, job rotations, and project-based learning experiences. These development opportunities take less time and effort, and can be integrated into the work already conducted within the organization. For example, the Office of Naval Research uses internal rotations with promising program officers and new hires to provide them with a view of how the entire agency works together through separate departments. These rotations allow all personnel to understand how their work fits in with the greater organization mission and to learn how other members of the organization use their products.

The following case example from ONR illustrates one synergistic program implementing an agency-wide academy, which shares agency best practices and also fosters inter-agency employee networking.

**Office of Naval Research Education and Networking Programs**
The Office of Naval Research has created a learning academy that invites employees to a training program three times a year. This program exposes employees to senior leadership, contracting processes, and financial procedures. The academy exposes personnel from various departments and commands to courses, presenters, and even colleagues they would not normally connect with. The atmosphere of development brings together people who normally interact with friction and begins an understanding of what other departments do.

ONR has also created an intra-agency resource called iConnect. iConnect acts like a social media hub or Facebook within ONR. Its function is to act as a social source that enables people to meet, see common connections, view connections that might be useful, and designate overarching share points. In addition, iConnect also tracks the people employees have worked with at ONR, and tracks what the different codes and departments do for a broader understanding of how everything connects. This social resource provides a more personal connection between employees, as well as making networking between departments more available and transparent. ◘

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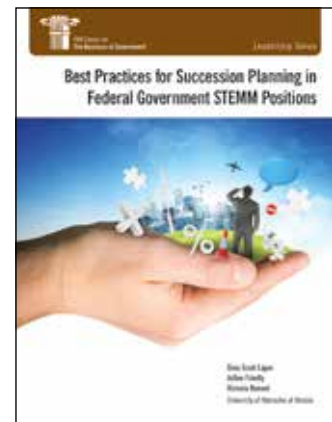
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