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Disruptive Opportunity: How the U.S. Census Bureau
Reimagined its Portfolio
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Executive Summary

This is the story of how one organization at the U.S. Census Bureau put in place portfolio management processes to reimagine and energize its core mission. The Demographic Statistical Methods Division (DSMD) at the Census Bureau relies heavily on work sponsored by other federal agencies and, in the disruptive reality of shrinking federal budgets, was facing increased competition from private sector and other federal service providers. This disruptive reality was a sink or swim opportunity for DSMD to improve how it competes for work and manages its resources.

To survive, DSMD had to enhance its portfolio by bringing in more research projects. To do this, it developed methods to elicit creative opportunities for research from staff, produced more accurate cost estimates and tracked the progress of the proposals as we presented them to our customers. Additionally, DSMD needed to do a better job managing its existing resources. It improved the WBS and project management methods to track cost expenditures, control project scope, and product delivery. It did this all under the constraints of the federal budget and federal hiring processes.

As a result, DSMD is now in a better place. The good news is that the creative proposal initiative has given DSMD increased stability in its operating budget across all programs. Additionally, DSMD is operating more efficiently. It has identified ongoing work, defined scope for each project, and has improved how it tracks costs, resources and deliverables.

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[1] *Editor's note: Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the 11th* *Annual UT Dallas Project Management Symposium in August 2017. It is republished here with the permission of the authors and conference organizers.*

[2] *This paper is released to inform interested parties of ongoing operations and to encourage discussion of work in progress. Any views expressed on operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.*

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Introduction

The U.S. Census Bureau, like many federal agencies, has had to contend with the double reality of budget reductions and Congress expecting the same amount of work despite the lower funding levels. Due to this, DSMD was facing a serious challenge: how to succeed in a market where there were fewer dollars for the statistical products it produced. Historically, DSMD has provided statistical methodological support for current demographic surveys conducted by the Census Bureau, as well as by other government agencies, through 'reimbursable' agreements. This was an especially challenging situation since DSMD competes for shared program money among other areas within the Census Bureau.

DSMD is unique in that it is supported by funding from multiple sources. This includes appropriated funding where DSMD has control over the scope, schedule, and budget and reimbursable funding from other government agencies and nonprofit entities through reimbursable agreements where DSMD does not have control over the scope, schedule, and budget and must act in alignment with priorities and needs of the external stakeholders. Additionally, DSMD faces constraints from the federal budget and hiring regulations. First, DSMD is constrained by the Federal budget process in that its funding cannot be rolled from one year to the next. It must spend a predetermined amount each fiscal year. Second, DSMD is constrained by the federal hiring process. DSMD is required to have steady (multi-year) funding for all of its positions in order to hire and maintain employment and the process to hire new employees is a cumbersome 6-month process.

Due to its particularly diverse portfolio and federal budget and hiring constraints, DSMD encountered challenges in how it solicited, planned, prioritized, and performed work. DSMD elicited work from sponsors that were independent of each other and with little visibility across the whole portfolio of sponsors. This process failed to ensure that the proposed and agreed to work was the 'right size' for DSMD staffing level and it contributed to the DSMD challenge of not being able to efficiently align budget and staffing with the work performed. These problems in turn led to missed deadlines, work products of poor quality and, eventually, the loss work to other government entities and private contractors. This became the catalyst for reimagining DSMD's portfolio process.

Before things continued out of hand, the PMO in DSMD, in cooperation with the leadership group, decided it was time to take a step back and look at DSMD's portfolio from the top down and see where they could make changes and improvements.

Understanding the Portfolio

To begin to understand its investment portfolio, DSMD started with the most fundamental questions: What is DSMD's identity, what type of work do we do and what can we offer our customers and sponsors?

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From here we took our first step (and a very important one), we started segmenting our work more logically and this brought some underlying assumptions to the surface. We started with the overt realization that we do not control the scope, schedule, and budget of the majority of DSMD's portfolio. For our reimbursable work, we are provided these constraints by multiple sponsors and needed to manage our staff and resources to produce the expected deliverables. We then realized that this constraint required the remainder of DSMD work (the appropriated funded work where we controlled the triple constraints) to be elastic when we had staffing shortages and unexpected scope changes. From this point, DSMD was prepared to understand the remainder of its portfolio management process.

After the important first step of realizing where control of the portfolio was, we were able to use that knowledge as a springboard to create a structured portfolio and begin to make more informed decisions on identifying work opportunities as well as planning and prioritizing our existing work. The next challenge was to identify what work was elastic and what work wasn't. As illustrated in Table 1, DSMD's reimbursable work, now identified as Sponsor-Controlled Investments, is split between Operation & Maintenance, the necessary work to conduct a recurring survey, and Research & Capability Enhancement, not research in the traditional sense, but exploration of new and different methods to conduct surveys more efficiently, with higher quality results. The research side of the portfolio is typically more elastic and can be used as a tool to help level resources with the output being deprioritized in favor of the more crucial operations & maintenance work, while still providing benefits to the survey sponsors. The appropriated work, now labeled division-controlled investments, also represented elastic work that could be rescheduled to accommodate the less elastic O&M work. From the portfolio level, we further broke down our work by sponsor, survey, and in some cases by product and deliverable. Creating these distinctions gave us the ability to make apples to apples comparisons when proposing and prioritizing work and also provide visibility to internal management and external sponsors on what we're doing and ultimately when and how we were doing it.

Table 1 DSMD Investments

Sponsor-Controlled Investments		Division-Controlled Investments
Operations and Maintenance	Research and Capability Enhancement	Research and Program Improvement Projects
64% of all investments	16% of all investments	20% of all investments
Fixed Resource Commitments	Elastic Resource Commitments	Elastic Resource Commitments

At the end of this phase, DSMD had an investment framework to slice and dice its portfolio based on who had ultimate control of the triple constraints, if the work was crucial to current survey administration, and by survey and sponsor.

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With the investment framework in place, the next task was to establish governance to execute the process. DSMD had to establish who would make all of the tough choices with priorities and who would decide across sponsors how work gets prioritized (when the really tough decisions needed to be made). DSMD, by design, is a flat organization with as few levels of management as possible and it is an extension of the Demographic Directorate which also has limited levels of functional management and includes all of the key players for the current demographic surveys. The challenge for DSMD was to identify which level would make portfolio investment decisions and know the appropriate times to escalate issues to the next level. The fact that roughly 80% of DSMD's portfolio was largely supported by multiple sponsors who are not reliant on, and in some cases, not even aware of one another, made decision making and prioritizing work especially challenging. To solve this DSMD created a Portfolio Management Governing Board (PMGB) make decisions on the division-controlled investments. This accounted for roughly 20% of the complete portfolio. For the remaining 80%, the PMGB escalated issues to the sponsors to ensure the appropriate stakeholders were involved in the decision making.

Reimagining the Portfolio

With the known budget and hiring constraints, along with the challenges of governance surrounding DSMD's diverse work and varied stakeholders, DSMD needed to improve its portfolio management at the proposal stage. Historically, DSMD simply responded to the sponsors calls for work by adding new work and then that work was managed from the bottom up. This posed significant risks where the type and amount of new work may not have matched with the resources and capabilities available within the division. DSMD needed to improve how it expanded its portfolio by moving the proposal process to a top down perspective.

This meant proactively proposing research work and utilizing the portfolio management process to compare the proposals to the available workforce. The DSMD PMO, in conjunction with the leadership team and the MITRE Corporation, developed a research brainstorming and proposal process. The process was implemented so that, prior to the formal work proposal, DSMD subject matter experts would look at each survey as a whole and develop (brainstorm) research ideas that would accompany the Operations and Maintenance work. The proposal process DSMD developed is outlined below:

- Conduct focus groups to generate research ideas for each of the surveys.
- Ask subject matter experts to develop proposals for the best ideas.
- Organize the research proposals by survey and ask the PMGB to review the proposals and vote on which were to move forward to the sponsor.
- Submit proposals to the survey sponsor and ask them to indicate their interest.
- Work with subject matter experts to develop cost estimates for the proposals that received sponsor interest.

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- Submit research project proposals and cost estimates to the survey sponsor with the annual operations and maintenance proposal.

Figure 1 Example of DSMD Research Proposal

DSMD Research Project Proposal				
Project Title	American Housing Survey – Calibration Research			
Proposed Fiscal Year for Project	**FY18**	**DSMD Area**		**SDE**
Short Description				
This research project will compare both bias and variance of the resultant estimates to lead to better weighting methods for the AHS.				
Background				
In preparation for the 2015 AHS, DSMD completed several research projects that have led to the improvement of AHS estimates. Research was conducted to improve both the noninterview adjustments and the ratio adjustments. The proposed research will follow-up on some new directions with the research. It will also blaze new trails by considering methods for calibrating both Housing Units (HU) and persons at the same time for both HU and person weights.				
Approach				
We will develop and compare several different methods for producing HU weights with simulation and/or AHS data. We will also include a comparison of person weights. The research will compare both bias and variance of the resultant estimates.				
Expected Benefits				
This research will lead to better weighting methods for AHS that will set the standard for census surveys that produce HU and person weights. We also will consider producing person weights, which is completely new for AHS.				

The proactive nature of this approach allowed DSMD to assert their role as the survey and methodology experts who knew the surveys inside and out. The other result of this change was DSMD's ability to tailor the amount and type of research and internally prioritize this research prior to presenting to the sponsors. This allowed DSMD to retain some amount of control of the scope for the sponsor-controlled portfolio. DSMD quickly realized the expected benefits, which included opening up additional opportunities for meaningful research work to compliment the routine production work, better utilization of staff's capabilities and more effective planning for future work, future training and recruitment of new staff.

Managing the Portfolio

After reimagining the portfolio, DSMD understood that they needed to improve their processes for managing the portfolio's day-to-day operations. DSMD evaluated their investment management processes and decided to begin by improving processes within the triple constraint. They looked at their scope, cost and schedule management processes and products and identified

two candidates where improvements would benefit these areas: the project proposal process and the work breakdown structure.

Project Proposal Process

The project proposal is the document where DSMD defines the scope of the work that will be included in the cost estimate that goes to the sponsor and then into the schedule that controls product delivery. Typically, the complex statistical products produced by DSMD are not well understood by most sponsors and this lack of understanding would manifest itself in vaguely written scope statements. Additionally, future design decisions at times would lead to inadvertent scope creep for DSMD's work products. The current project proposal document used the few high level work statements produced by the sponsor to define scope. For the agencies that have been working with Census for decades, this was sufficient because the work was well understood and the same from year to year. Adversely, the existing proposal document proved insufficient for new research projects and for new and returning surveys. It was with these projects where the scope statements did not provide enough definition for accurate cost estimates, scope management and schedules. In fact, the proposal process was hindering the effort to bring in new work because poor scope definition was behind most of the cost overruns and late product deliveries. DSMD implemented the following steps to improve the process:

- Consult with subject matter experts to identify and document work products each area produces.
- Create an inventory of work products that were currently being produced under each of the survey agreements.
- Redesign the survey proposal template to include the products list.
- Change the survey proposal process to acquire customer acceptance of the product list before work began.
- Use the product list to drive cost estimation and schedule development.

Table 2 below illustrates the old and new scope descriptions. The old process used statements that were very general and revealed little as to what products and activities the customer would be receiving in the future budget cycle. This lack of detail made it hard for the project manager to assign a cost estimate to the scope and for the customer to understand the basis for the proposed cost. The new process uses a list of specific products. DSMD provides the resulting list of products to the sponsoring agency for approval and, once approved, the list provides a solid scope from which DSMD develops accurate cost estimates and resource-loaded schedules.

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Table 2. Comparison of Scope Descriptions

Process	Scope Descriptions
Old Process - Scope Statements	• Writing and updating specifications that create and maintain Sample Control systems • Planning and coordinating with other divisions to determine sample size projections, rate of non-response over time, etc.
New Process - List of Products	• Sample size selection by PSU for future budgets • Annual update and maintenance of the sample allocation program • Update and maintenance of the yearly allocation memo to sponsor • Verification of the unit frame universe files for the yearly domain calculations • Creation of the unit frame take-every files for the annual unit frame samples • Selection and verification of the annual sample from the unit frame • Verification of sample code assignments for the annual unit frame samples • Calculation of base weights for the annual unit frame samples • Sample maintenance of the housing unit frame and group quarters frame samples • Sample selection documentation for the annual unit frame samples

Work Breakdown Structure

Standardizing the work breakdown structure (WBS) across all of the project schedules was another great place for DSMD to improve the project management process for its investment portfolio. The WBS is a product that influences schedule design and, subsequently, determines the level and quality of the micro data coming from the schedules in terms of effort expended and work completed to date. When well designed, the WBS will produce the following benefits:

- Transparency of work effort costs and delivery of products.
- Decomposition of project scope into understandable project deliverables.
- Decomposition of project deliverables into reportable work tasks.
- Decomposition of project scope into logical, understandable and trackable cost summary levels.

At the portfolio level, DSMD wanted to use a consistent WBS to aid in management of investments. When applied consistently across the investment portfolio, a WBS will:

- Create a consistent view into the cost and schedule status data being generated by the investments.
- Separate funds and resources allocated to the organization's strategic investment priorities from those supporting core operation and maintenance functions.

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- Organize and summarize cost and schedule data to support decision making for funding and resource leveling across the investments.

To achieve benefits for both the project manager and the portfolio manager, all schedules within the portfolio and the structure must use the same WBS and that WBS must be structured so that it is well understood by leadership and by staff implementing and reporting to the schedule tasks. This was not the case for DSMD. The current schedules all had differing work breakdown structures and many of them were unwieldly. This made it difficult to compare product deliverables across the schedules and create accurate cost estimates. The scope was decomposed into many varying sublevels that did not contribute to more accurate cost estimation or time reporting. In fact, many staff did not recognize their work in the many lines of schedules tasks and would resort to reporting time to overhead categories. This led to budget problems from too high overhead costs and too low direct costs. Additionally, the inaccurate charging were missed opportunities for DSMD to capture true effort expended on deliverables. This was especially damaging to the surveys with cycles that only repeated deliverables very two to three years.

DSMD engaged the MITRE Corporation to aid in the development of the WBS. Table 3 below shows the resulting levels and definitions MITRE developed for breaking down the portfolio, programs, products and work packages within DSMD.

Table 3 WBS Level Definitions

WBS Level	Description
Division	The division level is the summary line for all work activities within the organization
Portfolio	The Portfolio level is the summary line for the different portfolio types. This allows management to assess and group current or proposed investments to attain strategic goals, impacts and benefits.
Program	Programs is a summary line for a program that contains multiple projects at various stages of maturity and at different points in the lifecycle. There are no defined end dates for programs. On the other hand, projects within a program have defined start and end date boundaries and can be executed sequentially or concurrently with other projects in the same program.
Project Type	Project-type is the summary line for categorizing similar projects within the same program regardless of customer. All projects of the same project-type generate a nearly identical set of products and, by necessity, are therefore comprised of a nearly identical set of work-packages to produce those products. The amount of effort required and the complexity of the products may differ dramatically between projects of the same project-type.
Project	Project is the summary of work being performed with defined product requirements and definite date boundaries. For each project, requirements

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John Walsh

	can be decomposed into one or more products and each, in turn, decomposed into one or multiple work packages.
Product	The product level in the WBS comprises the set of activities necessary for creating project deliverables that provide value relative to the goals of the project. A product is a tangible deliverable that is generally provided to an external party (sponsor or survey director) and are generally agreed upon during the budget formulation process.
Work Package	A work package is a defined subset of the activities necessary to produce a deliverable. The work package level of the WBS is the level at which costs, budget, and schedule are monitored by the division program managers. This information may be derived from project planning and performance data prepared at the lower levels of the WBS. To allow for effective program monitoring, work package definitions must include specific start and end dates, outputs, quality requirements, and resource allocations (staff). Work packages are considered the building blocks that cost estimates, resource allocation plans, project schedules and other PM/RM artifacts are based upon.
Activities and Sub-Activities	Activities and Sub-Activities are created by each project as needed for project-level control and monitoring in an effort to assure scheduled delivery of the Work Packages.

The new WBS helped DSMD to organize its portfolio into consumable summaries. At the portfolio level, the WBS divides the investments into portfolios to help leadership see the resources that are allocated to work controlled by the sponsors versus the resources allocated to strategic initiatives controlled by the division. The program level further divides the portfolios into major groups such as sponsor-controlled operations and maintenance deliverables and sponsor-controlled research deliverables to help align the work to the workforce functions within the division. The project type further divides the portfolios into summaries of projects with similar characteristic such as a summary of sponsor controlled production work for household surveys collecting data through personal visits. This helps to consolidate similar work within the resource pools. The project level divides the work into surveys and other meaningful divisions that help leadership determine resource allocation or track project progress. The product level aligns the schedule to the scope developed in the survey proposals and summarizes tasks within a project so project managers can track and report progress to project stakeholders.

The work package level divides the products into tasks that show up on staff timesheets. Staff then report their time to the work packages for cost tracking and control during budget execution. The work packages align to the cost estimates developed for the sponsor during the budget formulation phase. This level is assigned resources on the schedule and the data generated creates the project micro data that is used for analysis in the current budget cycle and for input to cost estimates for future work. The activity level is used by the project manager to track smaller pieces of the work packages and important project milestones. This level is given dates and durations but is not assigned resources in the schedule. Table 4 illustrates two

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Second Edition[1]

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examples of DSMD products, Quality Assurance Parameters and Single Stage Sample Design Research, and how each would be assigned to the WBS levels.

Table 4 Examples of DSMD Work Products by WBS Level

WBS Level	Product 1 *Quality Assurance Parameters*	Product 2 *Single-Stage Sample Design Research*
Division	DSMD	DSMD
Portfolio	Sponsor Controlled Portfolio	Division Controlled Portfolio
Program	Operations and Maintenance	Redesign
Project Type	Household Surveys - Data collected by personal interviews	Statistical Methods
Project	Consumer Expenditures Surveys	Demographic Sample Survey Redesign
Product	Quality Assurance Parameters	Single-Stage Sample Design Research
Work Package	QA Parameters for WebCATI	Research Study Plan
Activities and Sub-Activities	QA Parameters for WebCATI – 1st Draft QA Parameters for WebCATI – 2nd Draft QA Parameters for WebCATI – Final QA Parameters for WebCATI delivered to sponsor	First Draft of Research Study Plan Feedback on Research Study Plan Finalize Research Study Plan Issue Research Study Plan

Conclusion

The process of understanding, reimaging and improving the management of the DSMD portfolio has returned benefits both internally to DSMD and externally to its stakeholders. The main internal benefit to DSMD is the increased visibility of work across all DSMD programs. This has helped DSMD leadership to make informed decisions on leveling resources and has led to improved product quality and timely product delivery. Improved portfolio management has also led to a more orderly budget formulation and execution process. On the external side, DSMD's stakeholders have benefited from the improved visibility into the work that is requested and performed and transparent cost estimates and project status. Additionally, they are benefitting from the potential for innovative solutions and updates for their survey methodology needs. By reimagining its portfolio, DSMD has improved how it works with the sponsors to identify innovative projects that bring program-wide benefits for controlling and reducing survey collection costs while not adversely impacting survey quality. Moving forward, we expect to reap more benefits in the short term by prioritizing our work and improving product quality and delivery. In the long term, DSMD will be in a better position to identify emerging industry trends to solve our customers' statistical challenges.

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