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OPTIMIZE NIH: APPLYING COMPUTER SIMULATION TO IMPROVE EFFICIENCY AND EFFECTIVENESS IN FEDERAL GOVERNMENT

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ABSTRACT

The NIH, a component of the U.S. HHS, launched Optimize NIH to improve organizational effectiveness and performance in support of the NIH mission. Optimize NIH focused efforts for achieving efficiencies in business processes of Committee Management, Ethics, and Freedom of Information Act (FOIA) functions through enterprise-wide improvements. A computer modeling and simulation approach was utilized to develop a greater understanding of these business processes and inform recommendations for improvement. The project team developed process maps, gathered data, and developed a computer model and simulation that was used to better understand resources needed to process requests and how to best deploy those resources organization-wide. The modeling approach developed for this activity and lessons learned can be utilized to improve delivery of services in a wide-variety of programs throughout the Federal Government.

1 INTRODUCTION

The NIH is the steward of medical and behavioral research for the Nation. The mission of the NIH is science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burden of illness and disability. The NIH is comprised of the Office of the Director and 27 research Institutes, Centers and Offices (ICOs).

2 BACKGROUND

In 2018, the NIH was tasked with analyzing processes and implementing change to improve efficiency and effectiveness of three enterprise wide services that support the NIH research mission. These three functions consist of FOIA, Committee Management, and Ethics Support. These services are performed by cross-functional staff in both centralized roles (e.g. establishing policy, review and approval roles), as well as de-centralized roles throughout the NIH research ICOs (e.g. intake and initiation of requests, communicating with requestors).

At the beginning of this project, these functions had limited or non-existent process-related data. The processes consisted of a paper and/or electronic workflow with limited visibility. Documentation of processes utilizing a consistent or established method of process mapping was also lacking. Electronic systems were in place for certain aspects of the process workflow, however these systems were not designed to produce process performance-related metrics.

3 APPROACH

An approach was developed to gather the information and data needed to develop a computer model and simulation of processes within each of these functions. The model was then utilized as a basis to evaluate proposed future state changes prior to implementation. A generic model was developed that could be rapidly customized and scaled to incorporate over 40 business processes represented across these three functional areas.

Initially, processes were mapped using a standardized approach by teams consisting of functional experts throughout the organization. A deployment flowchart method was utilized, capturing roles and responsibilities, key decisions or differences in how work was done across the organization, and hand-offs among participants in the processes.

Using these process maps as a baseline, a data collection template was developed to gather data at a meaningful level. Data collected consisted of demand, resources involved in various steps of the process, and a variety of well-defined process time-related metrics. Historical data from existing information technology (IT) systems was collected where possible. Where data was non-existent, a representative group of subject matter experts, along with validation obtained from functional leadership, provided a range of estimates (average, minimum, maximum, or estimated decision outcomes)

A baseline, or as-is, computer model and simulation was developed using the data collected This model went through a number of iterations of validation with functional teams to ensure that the baseline outcome was consistent with expectations. The model was then utilized to evaluate the impact of proposed changes to workflow, resources, and process time through policy changes or investment in automation.

4 BENEFITS

Utilizing this approach lead to a greater understanding and quantification of impact of to-be process changes. The impact of process consistency across various ICOs throughout the NIH could be better quantified in terms of resource utilization or impact on cycle time. Functional teams were better able to demonstrate how particular changes (e.g. acquisition of an IT system) would impact overall process performance.

Functional teams were also better able to understand the effect of different ways of deploying staff resources at different points in the process. Scenarios that were run demonstrated how staff could be made available at particular phases of the process to be utilized elsewhere.

This computer modeling and simulation approach enabled decision makers to better understand the impact changes to the system on service delivery, as well as to better identify, understand, and mitigate risks identified through experimentation with the wide range of scenarios. This scalable and modular approach enabled a holistic decision making capability that helps to reduce risk of sub-optimization.

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