
AGA Dallas Chapter PDT
The CFO of the Future Now
March 25, 2021

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NSF'S MISSION
To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.
Director's Vision
Advance the frontiers of research into the future
Ensure accessibility and inclusivity
Secure global leadership
We are in a DEFINING MOMENT
Intensity of global competition
Urgent need for domestic talent
Broad support for science as path for solving global grand challenges
We can accomplish this vision with:
SPEED AND SCALE
PEOPLE
PARTNERSHIPS
NSF
TRANSLATION

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Division of Financial Management Innovation Lab

Deal with Data | Leverage Automation | Reduce Compliance Burdens | Build Stronger Organizations | Unlock Value

A	B	C	D	E
Automation	Blockchain	Cybersecurity	Data Science	ERM and IC

Change Management

Reference/based on: GAO Innovation Lab, COSO ERM, and *UMD Professor Larry Gordon, The Impact of Technology on Contemporary Accounting: An ABCD Perspective*

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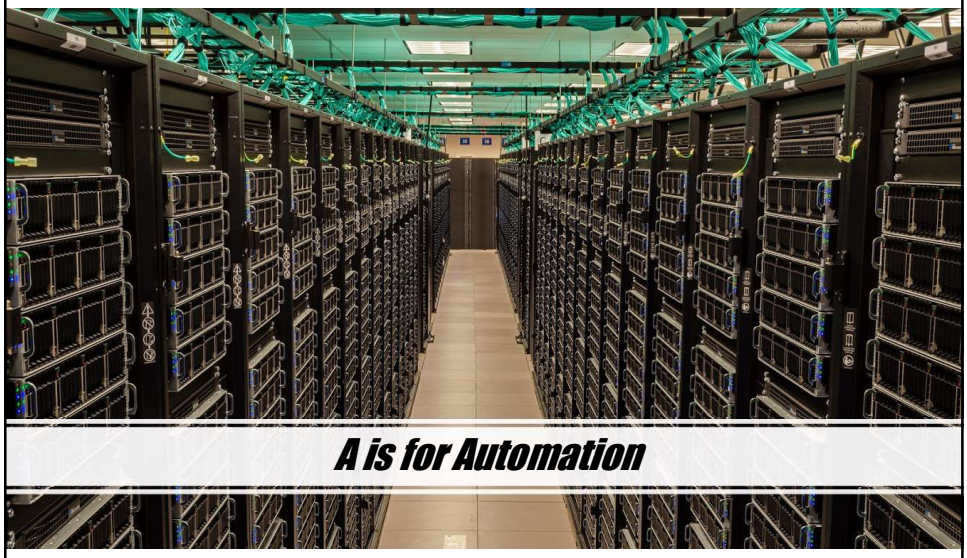

A is for Automation

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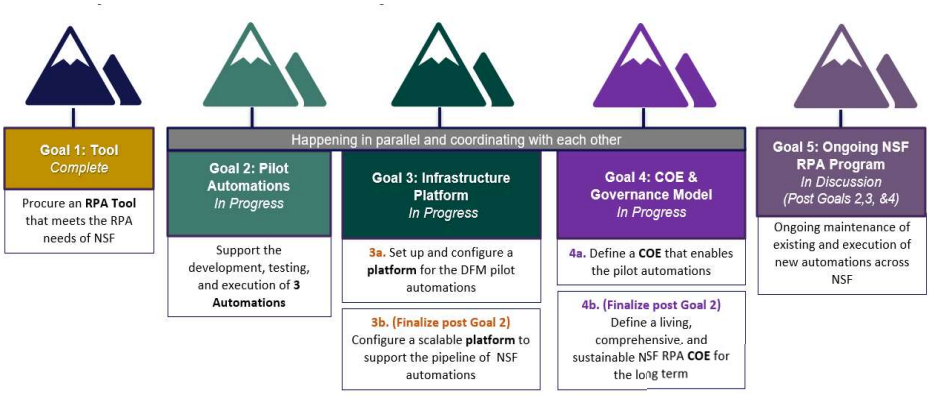
NSF Robotic Processing Automation Journey



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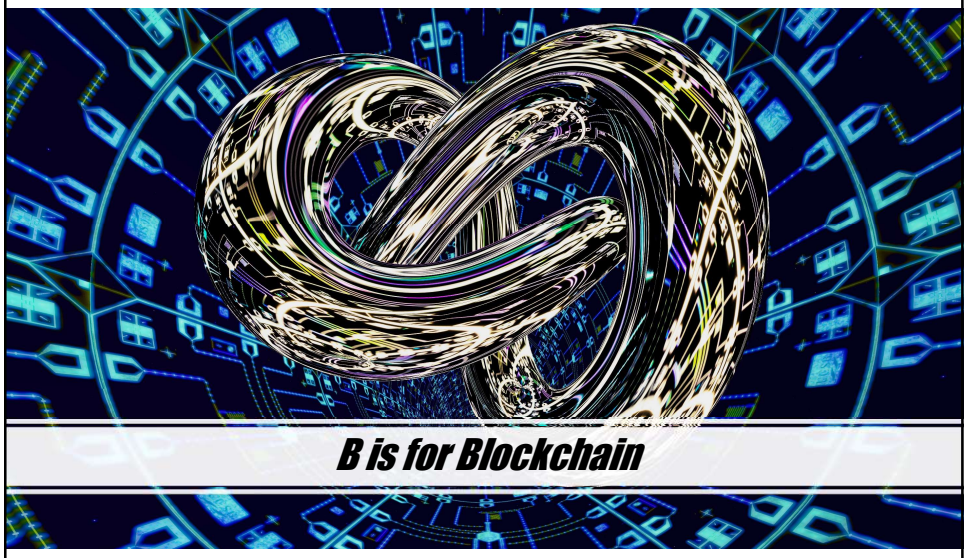

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Blockchain Proof of Concept Overview

FIT took a user-centric approach to enhance an existing prototype based on stakeholder feedback, assessed regulatory and legal implications of the blockchain prototype, and deployed the solution in the Bureau's first innovation sandbox.

Objectives

- Identify the **legal/policy/regulatory barriers** to tokenize Federal grant payments
- Stand up a **stakeholder ecosystem** to provide feedback on blockchain solution
- Make **functional and technical enhancements** to POC based on feedback
- Assess what **metrics** a DLT solution would improve over the current state

Approach

- **100+** stakeholders engaged across 9 demos, 2 workshops, and SME working sessions
- Conducted outreach with **15** government organizations and **57** universities
- **30+** laws, regulations and policies identified related to grant payments
- Developed a **clickable prototype** to maximize MVP socialization and feedback
- **Deployed MVP** in Bureau innovation "sandbox" environment

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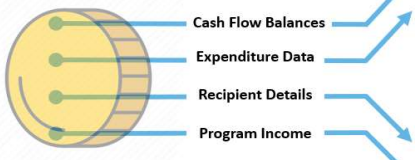
Reducing Grantee Burden To Submit Federal Financial Reports

The SF-425 is one of the most time-consuming reporting requirements for university grant administrators. With DLT, the grant information and payment data are digitized and stored on a token, enabling one–click auto population of the report.

Today, an average of 8 FTEs spend 5 hours collecting 15+ data elements to populate a single SF-425. A DLT token would be able to auto-populate this report within seconds.



"This would be a terrific, administrative saving feature." – Lynette Arias, Univ of Washington

Federal Financial Report — OMB Number: 4040-0014

Federal Cash (To report multiple grants, also use FFR attachment):	
a. Cash Receipts	0.00
b. Cash Disbursements	0.00
c. Cash on Hand (line a minus b)	0.00
(Use lines d-o for single grant reporting)	
Federal Expenditures and Unobligated Balance:	
d. Total Federal funds authorized	0.00
e. Federal share of expenditures	0.00
f. Federal share of unliquidated obligations	0.00
g. Total Federal share (sum of lines e and f)	0.00
h. Unobligated balance of Federal Funds (line d minus g)	0.00
Recipient Share:	
i. Total recipient share required	0.00
j. Recipient share of expenditures	0.00
k. Remaining recipient share to be provided (line i minus j)	0.00
Program Income:	
l. Total Federal program income earned	0.00

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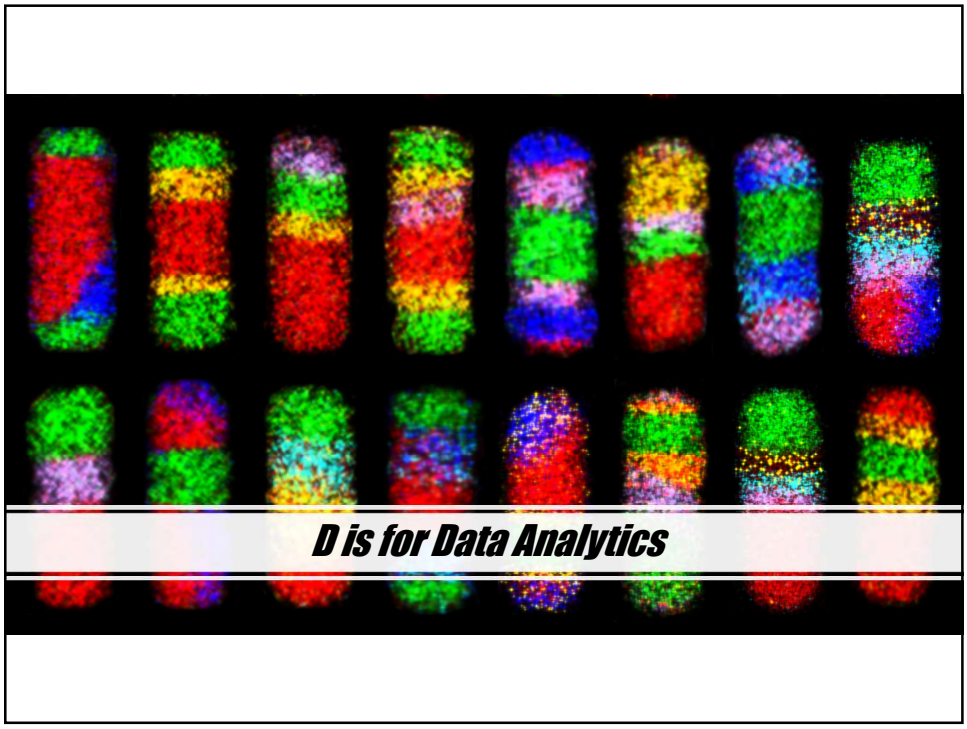

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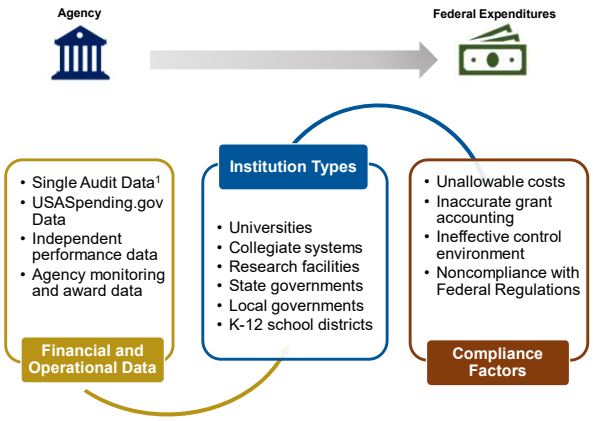
Statistical Learning and Modeling Improper Payments Logistic Model

- Initial use case to begin implementing data science techniques
- Streamline PIIA compliance and reporting requirements
- Turning data into information to drive decision making
- Professional development opportunity - upskilling for the workforce of the future



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[1] Federal Audit Clearinghouse Single Audit summary data

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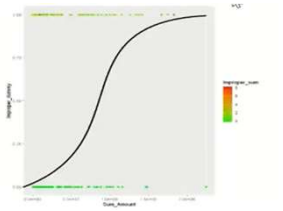
Statistical Learning and Modeling
Improper Payments Logistic Model

Model Development

```
In [11]: M Logistic_demo <- readPNG("Logistic_demo.png")
           plot.new()
           rasterImage(Logistic_demo,0,0,1,1)
```



Model Results

Using the initial results as a basis for prediction, the model predicted with **87% accuracy** whether an institution would have an improper payment over a five-year period.

	Actual Positive	Actual Negative
Predicted Positive	**34 (8.9%)**	25 (5.7%)
Predicted Negative	39 (7.8%)	**339 (77.6%)**

Equation for Probability of an Improper Payment Finding

$$log\frac{1}{1-p} = \beta X_1 + \beta X_2 + \cdots \beta X_9$$

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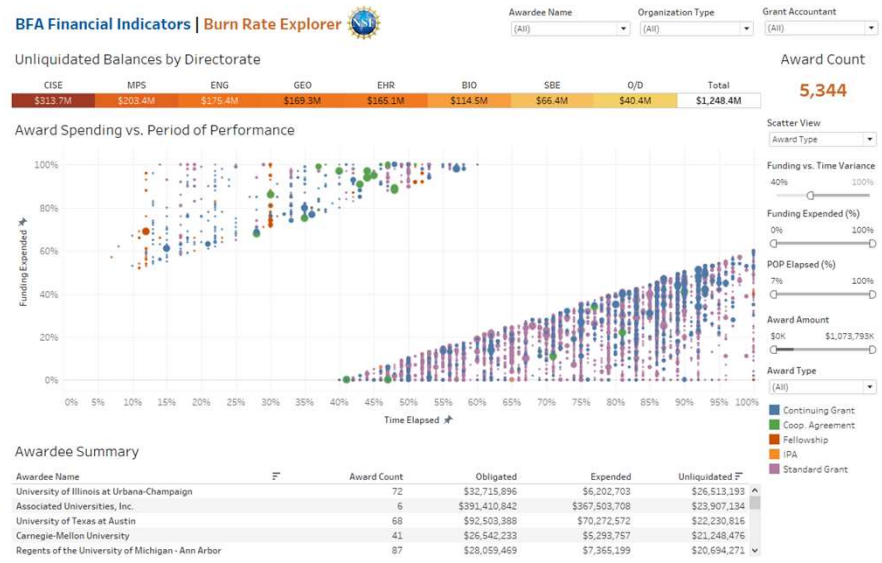
Data Aggregation and Visualization
Burn Rate Explorer



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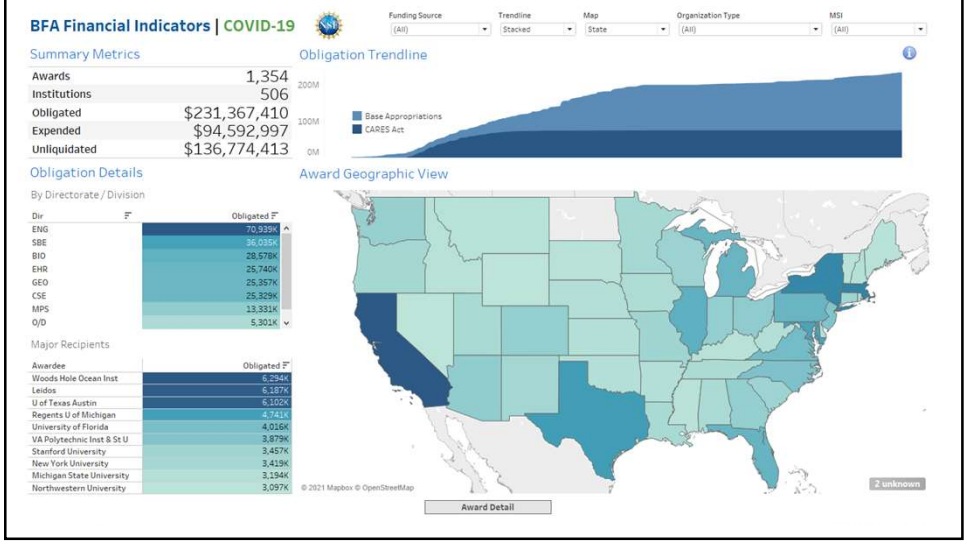
Data Aggregation and Visualization COVID-19 Grant Response



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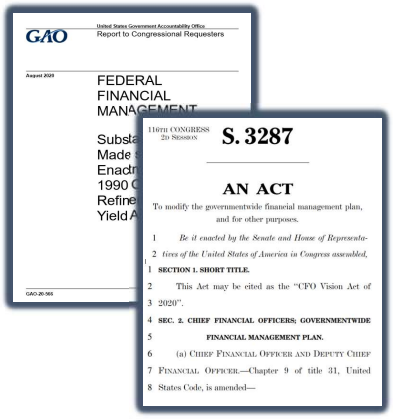
CFO Act Visions for the Future



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NSF Virtual Giftbag

Blockchain "Clickable" Prototype

- https://projects.invisionapp.com/share/XR102NLZB9MD
- **Password:** fit_gps

Improper Payment Logistic Model

- https://github.com/https://github.com/NSF-DFM/AGA_TTS2020_DataSciencePilot
- Github account required (Free)

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