



Financial Obligation Root Cause Explorer



#TTS21

Speed and Scale Motivation



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
- TRANSLATION

H. R. 3684

One Hundred Seventeenth Congress
of the
United States of America
AT THE FIRST SESSION
Begun and held at the City of Washington on Monday,
the third day of January, two thousand and twenty-one

An Act
To authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

(a) SHORT TITLE.—This Act may be cited as the "Infrastructure Investment and Jobs Act".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Sec. 1. Short title table of contents.

Sec. 2. Definitions.

DIVISION A—SEAFACE TRANSPORTATION

TITLE 1—FEDERAL-AID HIGHWAYS

Subtitle A—Authorizations and Programs

Sec. 1101	Authorization of appropriations
Sec. 1102	Definitions
Sec. 1103	Appropriations
Sec. 1104	Emergency performance program
Sec. 1105	Emergency relief projects
Sec. 1106	Roadway highway credit coverage
Sec. 1107	Surface transportation block grant program
Sec. 1108	Highway safety improvement program
Sec. 1109	Rural local transportation program
Sec. 1110	Rural local highway program
Sec. 1111	Rural local highway program
Sec. 1112	Construction acquisition and quality improvement program
Sec. 1113	Construction acquisition and quality improvement program
Sec. 1114	Construction acquisition and quality improvement program
Sec. 1115	Construction acquisition and quality improvement program
Sec. 1116	Construction acquisition and quality improvement program
Sec. 1117	Construction acquisition and quality improvement program
Sec. 1118	Construction acquisition and quality improvement program
Sec. 1119	Construction acquisition and quality improvement program
Sec. 1120	Construction acquisition and quality improvement program
Sec. 1121	Construction acquisition and quality improvement program
Sec. 1122	Construction acquisition and quality improvement program
Sec. 1123	Construction acquisition and quality improvement program
Sec. 1124	Construction acquisition and quality improvement program
Sec. 1125	Construction acquisition and quality improvement program
Sec. 1126	Construction acquisition and quality improvement program
Sec. 1127	Construction acquisition and quality improvement program
Sec. 1128	Construction acquisition and quality improvement program
Sec. 1129	Construction acquisition and quality improvement program
Sec. 1130	Construction acquisition and quality improvement program
Sec. 1131	Construction acquisition and quality improvement program
Sec. 1132	Construction acquisition and quality improvement program
Sec. 1133	Construction acquisition and quality improvement program
Sec. 1134	Construction acquisition and quality improvement program
Sec. 1135	Construction acquisition and quality improvement program
Sec. 1136	Construction acquisition and quality improvement program
Sec. 1137	Construction acquisition and quality improvement program
Sec. 1138	Construction acquisition and quality improvement program
Sec. 1139	Construction acquisition and quality improvement program
Sec. 1140	Construction acquisition and quality improvement program
Sec. 1141	Construction acquisition and quality improvement program
Sec. 1142	Construction acquisition and quality improvement program
Sec. 1143	Construction acquisition and quality improvement program
Sec. 1144	Construction acquisition and quality improvement program
Sec. 1145	Construction acquisition and quality improvement program
Sec. 1146	Construction acquisition and quality improvement program
Sec. 1147	Construction acquisition and quality improvement program
Sec. 1148	Construction acquisition and quality improvement program
Sec. 1149	Construction acquisition and quality improvement program
Sec. 1150	Construction acquisition and quality improvement program
Sec. 1151	Construction acquisition and quality improvement program
Sec. 1152	Construction acquisition and quality improvement program
Sec. 1153	Construction acquisition and quality improvement program
Sec. 1154	Construction acquisition and quality improvement program
Sec. 1155	Construction acquisition and quality improvement program
Sec. 1156	Construction acquisition and quality improvement program
Sec. 1157	Construction acquisition and quality improvement program
Sec. 1158	Construction acquisition and quality improvement program
Sec. 1159	Construction acquisition and quality improvement program
Sec. 1160	Construction acquisition and quality improvement program
Sec. 1161	Construction acquisition and quality improvement program
Sec. 1162	Construction acquisition and quality improvement program
Sec. 1163	Construction acquisition and quality improvement program
Sec. 1164	Construction acquisition and quality improvement program
Sec. 1165	Construction acquisition and quality improvement program
Sec. 1166	Construction acquisition and quality improvement program
Sec. 1167	Construction acquisition and quality improvement program
Sec. 1168	Construction acquisition and quality improvement program
Sec. 1169	Construction acquisition and quality improvement program
Sec. 1170	Construction acquisition and quality improvement program
Sec. 1171	Construction acquisition and quality improvement program
Sec. 1172	Construction acquisition and quality improvement program
Sec. 1173	Construction acquisition and quality improvement program
Sec. 1174	Construction acquisition and quality improvement program
Sec. 1175	Construction acquisition and quality improvement program
Sec. 1176	Construction acquisition and quality improvement program
Sec. 1177	Construction acquisition and quality improvement program
Sec. 1178	Construction acquisition and quality improvement program
Sec. 1179	Construction acquisition and quality improvement program
Sec. 1180	Construction acquisition and quality improvement program
Sec. 1181	Construction acquisition and quality improvement program
Sec. 1182	Construction acquisition and quality improvement program
Sec. 1183	Construction acquisition and quality improvement program
Sec. 1184	Construction acquisition and quality improvement program
Sec. 1185	Construction acquisition and quality improvement program
Sec. 1186	Construction acquisition and quality improvement program
Sec. 1187	Construction acquisition and quality improvement program
Sec. 1188	Construction acquisition and quality improvement program
Sec. 1189	Construction acquisition and quality improvement program
Sec. 1190	Construction acquisition and quality improvement program
Sec. 1191	Construction acquisition and quality improvement program
Sec. 1192	Construction acquisition and quality improvement program
Sec. 1193	Construction acquisition and quality improvement program
Sec. 1194	Construction acquisition and quality improvement program
Sec. 1195	Construction acquisition and quality improvement program
Sec. 1196	Construction acquisition and quality improvement program
Sec. 1197	Construction acquisition and quality improvement program
Sec. 1198	Construction acquisition and quality improvement program
Sec. 1199	Construction acquisition and quality improvement program
Sec. 1200	Construction acquisition and quality improvement program

On November 15, 2021, Agencies completed their 25th CFO Act Audits and the President signed the bipartisan \$1 trillion Infrastructure Bill into law.

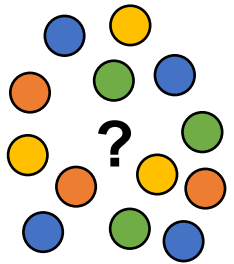
FORCE Technology Stack



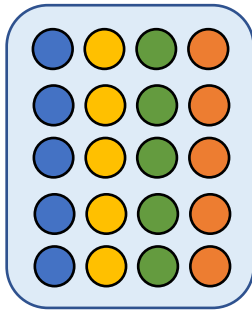
Financial Obligation Root Cause Explorer (FORCE) uses an **innovative technology stack** to analyze grants with potential spending delays and **uncover hidden themes** through artificial intelligence.

Nightly Automated Processing

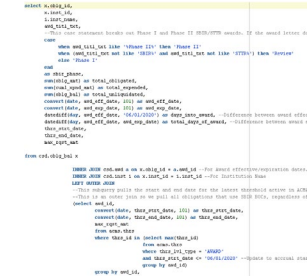
Data Aggregation and Transformation



Raw Data



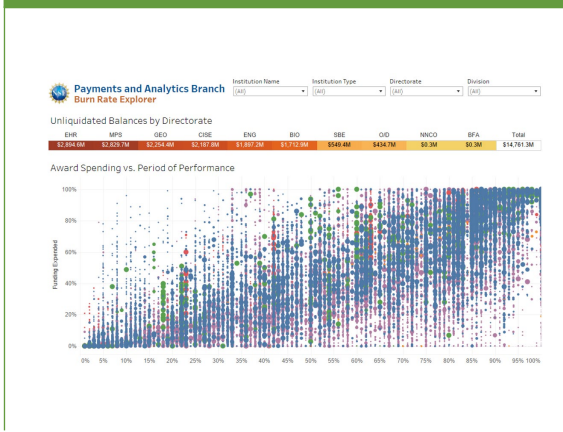
Data Lake



Data Curation

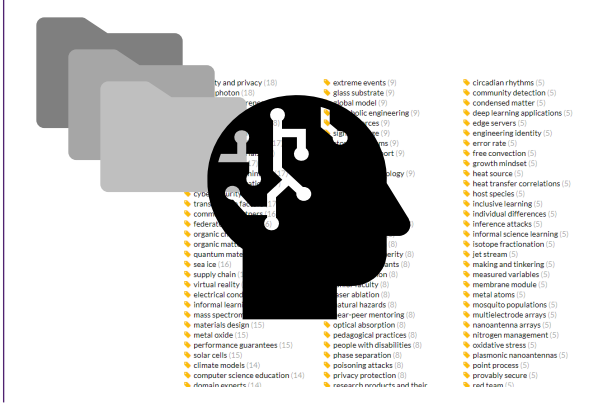
Ad Hoc Analysis and Advanced Insights

Data Visualization



Dashboards and Text Analytics

Artificial Intelligence / Machine Learning

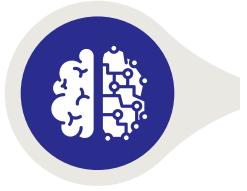


Natural Language Processing



#TTS20

Closing Thoughts

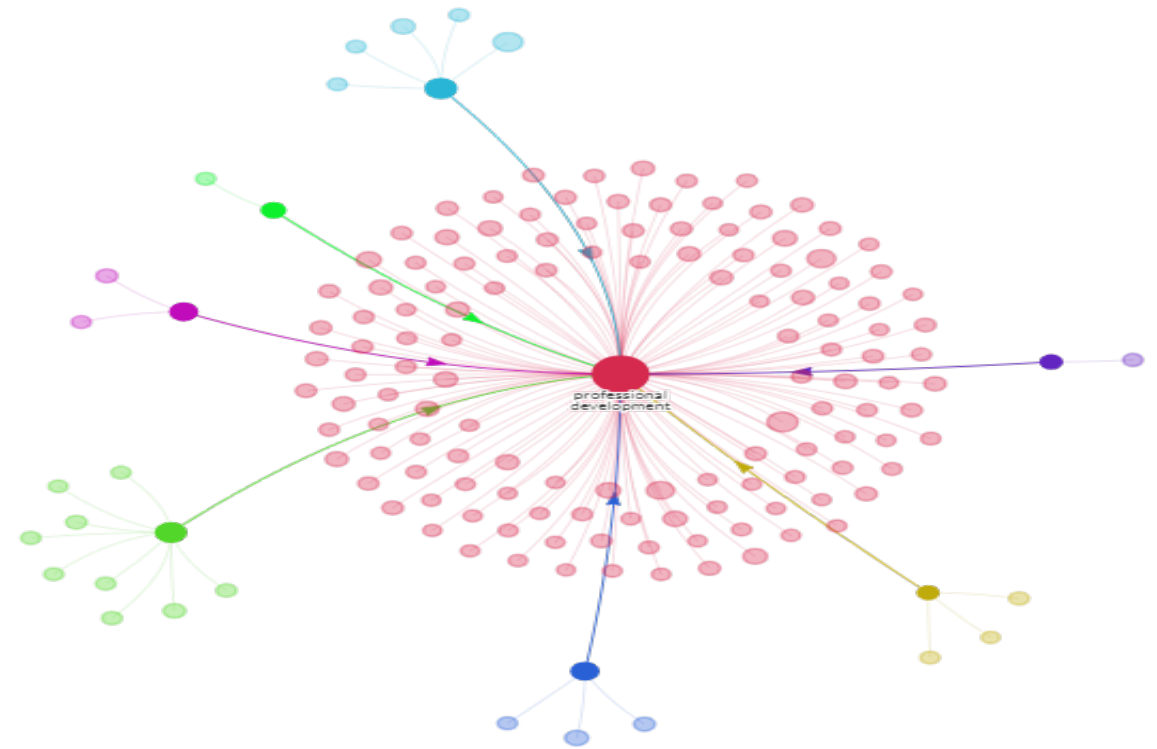
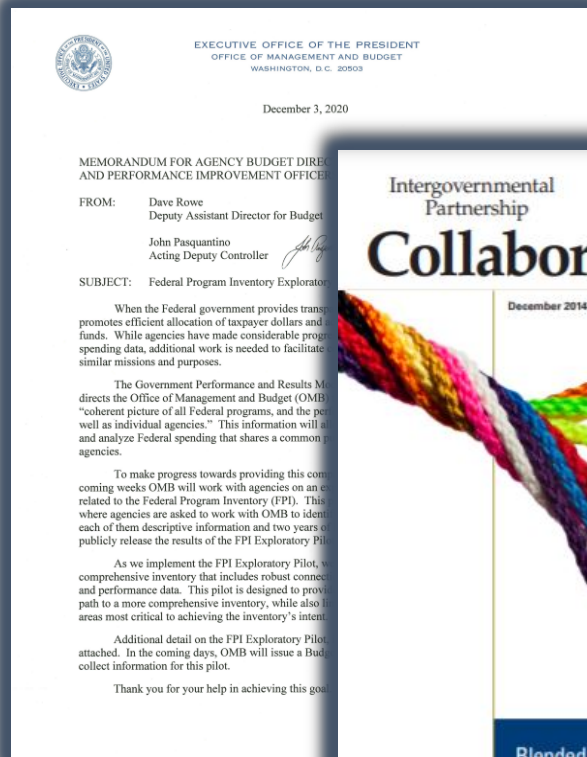


Innovation. Implements cutting-edge processes that transforms data, information, and knowledge; questions the compliance status quo, and connects the dots between financial management and programmatic disciplines through advanced insights and analytics.

Closing Thoughts



New Approaches to Program Inventory or AGA Blended and Braided Funding Challenges!

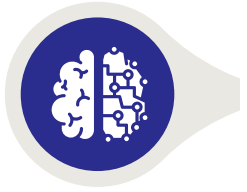


Illustrative Graph View of STEM EDUCATION



#TTS21

Closing Thoughts



Innovation. Implements cutting-edge processes that transforms data, information, and knowledge; questions the compliance status quo, and connects the dots between financial management and programmatic disciplines through advanced insights and analytics. **New Approaches to Program Inventory or AGA Blended/Braided Funding Challenges!**



Transferability. This initial use case is ripe to expand for government-wide shared services and management to auditor collaborations.



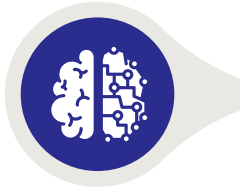
USASPENDING.gov

Think Data Act + FORCE = USAspending v2.0!



#TTS21

Closing Thoughts



Innovation. Implements cutting-edge processes, questions the status quo, and connects the dots between financial management and programmatic disciplines through advanced insights and analytics. **New Approaches to Program Inventory or AGA Blended/Braided Funding Challenges!**



Transferability. This initial use case is ripe to expand for government-wide shared services and management to auditor collaborations.
Think Data Act + Force = USAspending v2.0!



Benefits to Others. Creates tremendous workforce upskilling opportunities and balances value and compliance workloads.
AI/ML Beginner's Guide: [The Artificial Intelligence Wiki | Pathmind](#)

Contact Information



Jesse Simons

Chief, Payments and Analytics Branch

jsimons@nsf.gov

Mike Wetklow

Deputy CFO and Division Director Financial Management

mwetklow@nsf.gov