

Augmented Intelligence

Advanced Analytics with AI

November 6, 2019



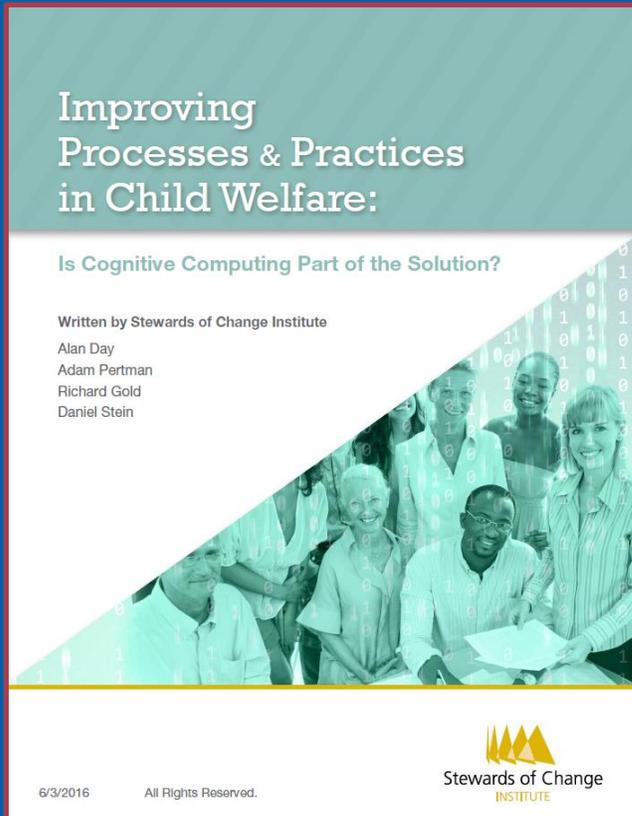
WHO ARE WE?

THE TEAM

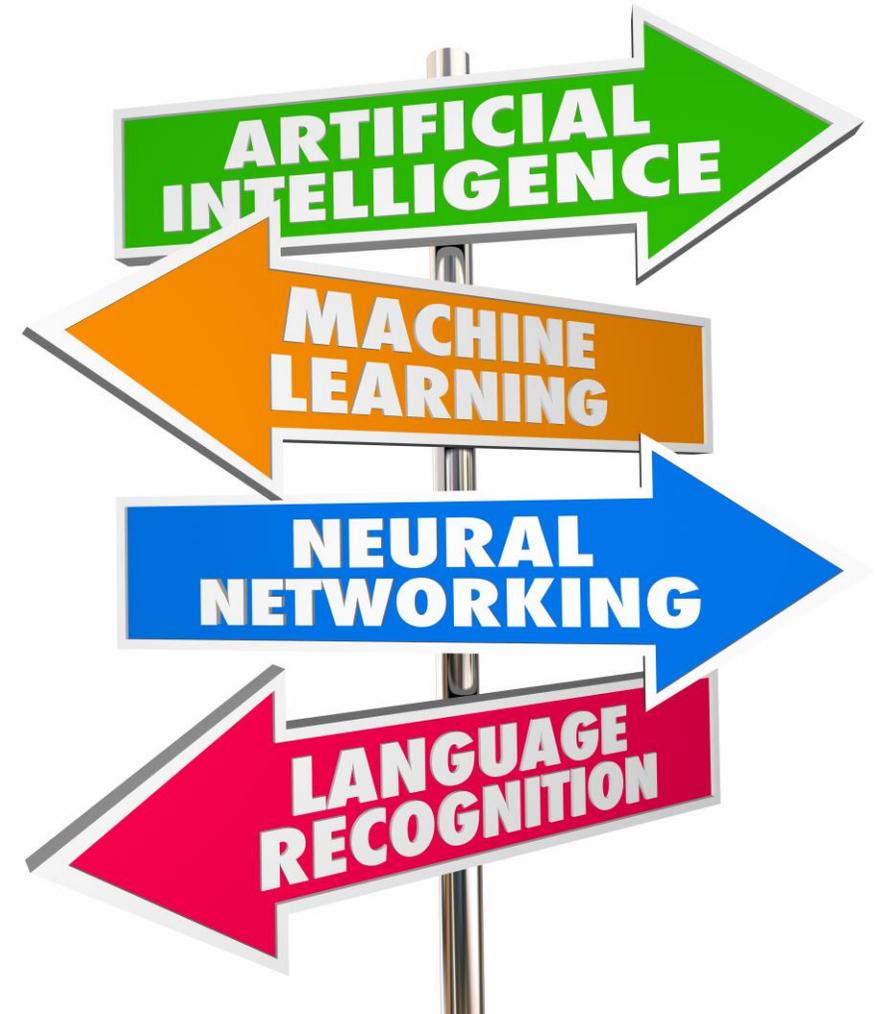
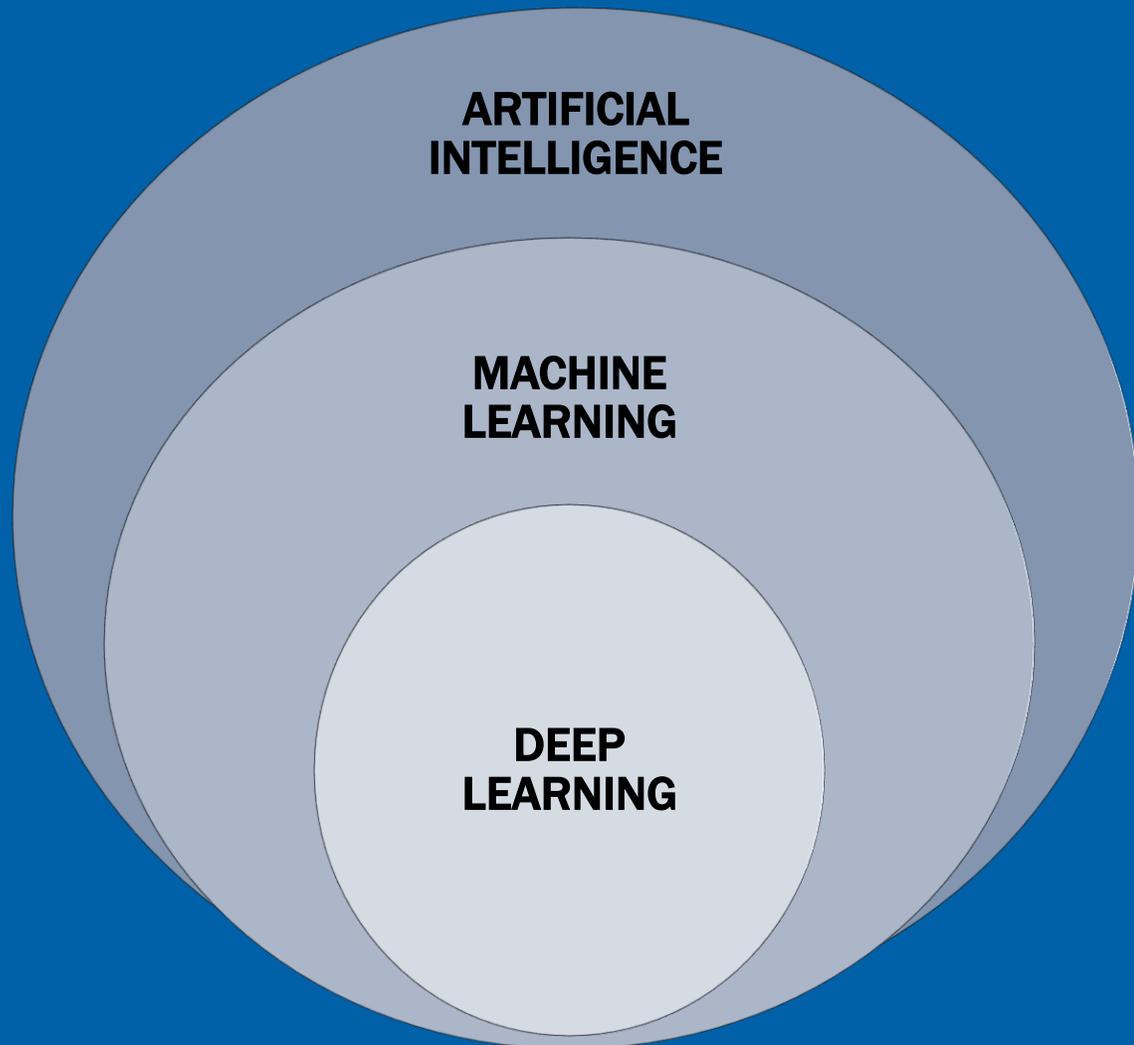
- Marty Elisco – CEO of Augmented Intelligence
- Jim Lindstrom – VP, Product & Engineering
- Daniel Stein – Founder of Stewards of Change, a human services think tank & consultancy
- Vernon Brown – CEO of Aspiranet, a large California-based provider
- Michael Smith – CEO of Linx, a New York based marketing consultancy
- Martin Duggan – Former IBM Social Programs Leader

OUR MISSION

We are a social impact company that is pioneering the development of artificial intelligence and care coordination for social services agencies. Guided by decades of thought leadership, our solutions create new knowledge in organizations to enhance practice, operations and workforce capacity to improve the lives of individuals and families.



ARTIFICIAL INTELLIGENCE OVERVIEW



Natural Language Processing = Statistics + Linguistics + AI

APPLYING AI IN SOCIAL SERVICES

Case notes are by far the largest and one of the most valuable sources of data about a case.

...But the volume of progress notes data is immense.

Natural Language Processing AI can help access critical information to help make decisions based on the millions of case notes in state and agency case management and medical records systems.



PARTNERSHIP TIMELINE OF EVENTS



January 2019

AugIntel provides overview to COFCCA ISC

March

Roundtables conducted to identify and prioritize AI applications

May

Proposals created

July

Planning begins

September

Meeting with ACS and OCFS as stakeholders

February

The New York Foundling, MercyFirst and SCO elect to begin pilot explorations

April

OCFS engaged to obtain access to Connections data

June

Negotiations & contracting executed with the New York Foundling as lead agency

August

Initial development begins
Awarded finalist in RWJ SDOH Innovation Challenge



SOCIAL DETERMINANTS OF HEALTH INNOVATION CHALLENGE – FIRST PLACE



- 150 startups competed
- Narrowed down three finalists – including us!
- We competed for the championship at the Health 2.0 Conference in Santa Clara, CA on September 16, and was awarded first place.



AUGMENTED INTELLIGENCE SOFTWARE DEMO

SOFTWARE DEMONSTRATION

The image displays a sequence of overlapping document pages from a case management system. Each page is titled "Dobson Family:" and contains various sections of text and metadata. The pages are arranged in a perspective view, showing the progression of the case file.

Key sections visible on the pages include:

- Case Information:** Case Name: Dobson, LaVerne; Case ID; Case Initiation Date; District With Case Management: ANX.
- TEACHING CASE: NOT FOR USE AS PRACTICE MODEL**
- Progress Notes Narrative:** Describes interactions between the worker and the family, including discussions about the children's care and the father's involvement.
- Event Log:** Lists events with dates, authors, methods, locations, and purposes.
- Final Progress Notes Page:** Includes a table with columns for Event Date, Event Time, Dist. Agt., Note Status, and Entered By.

Event Date	Event Time	Dist. Agt.	Note Status	Entered By
3/28/20xx	9:00 am	ANX	Final	J. Mercado

© 2010 Research Foundation of SUNY/BSC/CDHS No. 8 Handout (07/10) A62

Software Input: Case notes contained in case management systems
Source: Research Foundation of SUNY/BSC/CDHS, 2010
Note: Above are several pages out of 100 total pages in one case file

DEMO

Referral Reason: biological mother tested positive for marijuana after giving birth. **SUBST-ABUSE** biological mother is currently enrolled in substance abuse treatment and attends daily. At the time of referral, biological father has been removed from the home, active court case against father for sexual abuse of another child. **SEXUAL-ABUSE**

[...] There is no indication that the child is engaged in any illegal activity or drug use/sales at this time. biological mother has a prior indicated case for educational neglect of younger child Preston. **NEGLECT** biological mother served three years in prison and ended her 5-year probation without incident earlier this year. biological father, who lives in Pennsylvania, has also served time in prison and is currently on probation.



PROBLEMS → SOLUTIONS → BENEFITS & ROI

EXAMPLES



PILOT AI APPLICATIONS

1: Client Risk Profile Identifier

2: Client Strength Profile Identifier

3: Client Timeline

4: Client Relationship Identifier

5: Supervision Tools to Monitor Program Fidelity

6: Progress Notes Validator



SUPERVISOR AND FRONT-LINE STAFF APPLICATIONS

Assess completeness of case note

Flag safety and risk issues

Flag strengths and barriers to permanency

Summarize case

Identify case participants

Search across case notes in multiple systems

Review notes for legal and practice issues

Recommend goals & actions

Identify need for immediate intervention and send alerts

Assess case complexity and assign to appropriate case manager

Planned

Future



QUALITY IMPROVEMENT APPLICATIONS

Assess conformance to program models, EBPs and contracts

More precisely identify notes that need to be reviewed

Automate data collection to support case record reviews

Planned

Future



AGENCY MANAGEMENT APPLICATIONS

Report conformance to program models, EBPs and contracts

Identify case practice areas requiring training

Identify resource allocation needs

Assess trends in population-based issues

Identify duplicate person records (PIDs)

Assess commonality across notes and move to "structured" fields

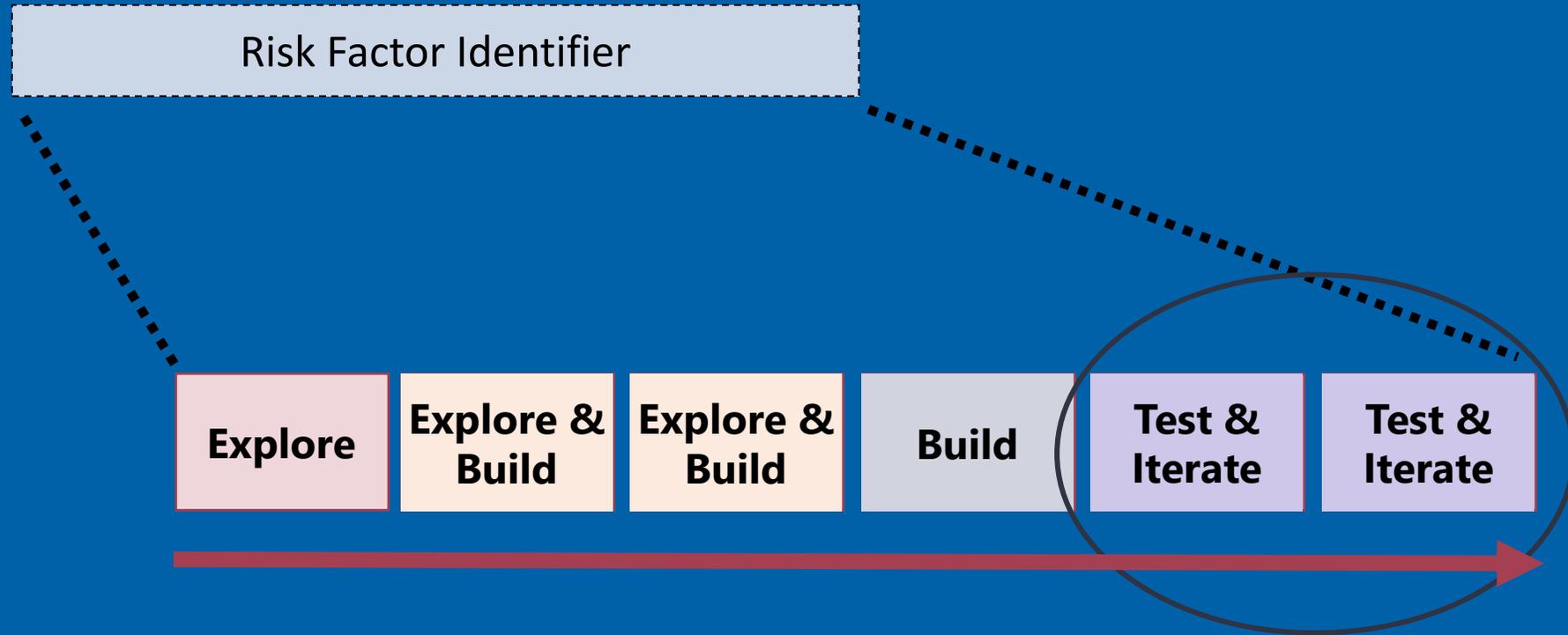
Assess overall case complexity across agency to ID resource and funding needs

Planned

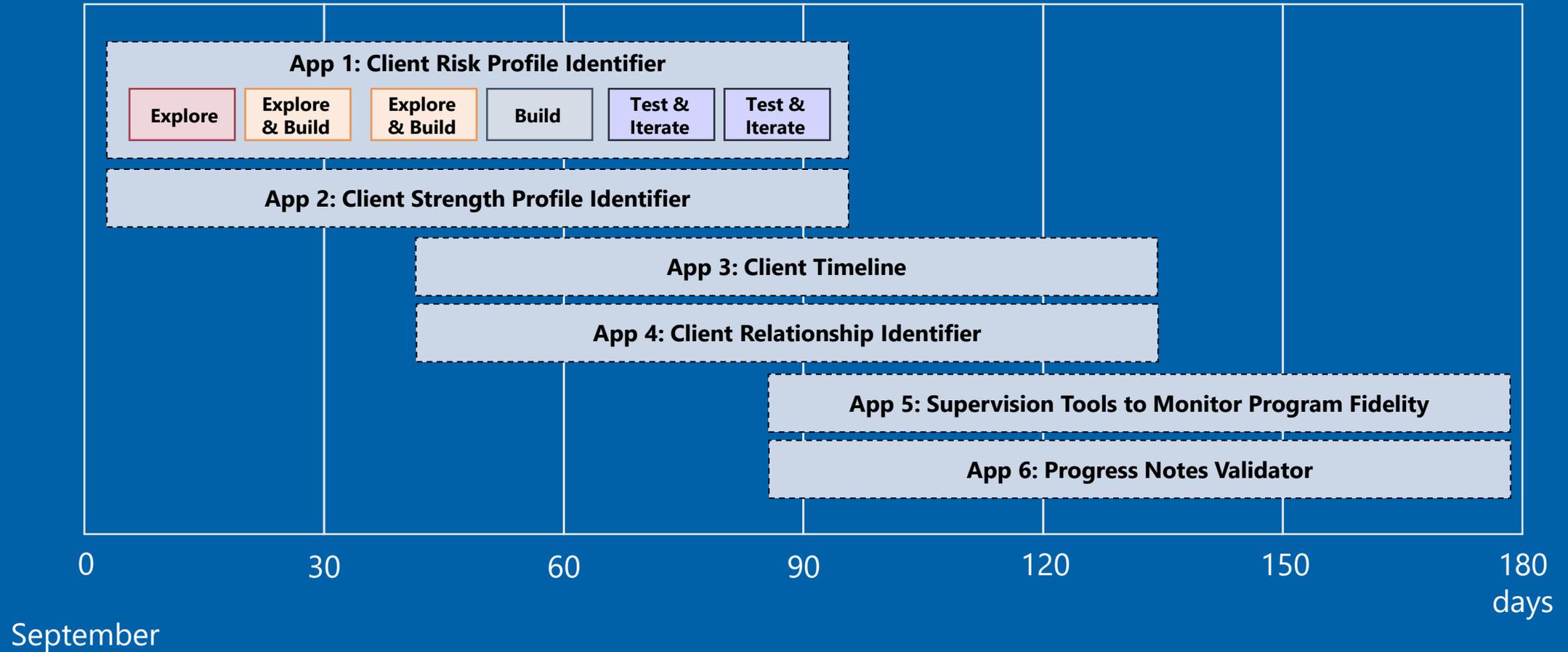
Future



METHODOLOGY: ITERATE



PILOT PROJECT TIMELINE



PILOT TEAM ACTIVITIES

Participate in interviews

Review UI sketches

Create glossary of jargon

Tag training data

Rate application output

Provide input on questions and trade-offs

Use product in day-to-day work



THANK YOU

Q&A

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APPENDIX



DATA SOURCE DISCUSSION

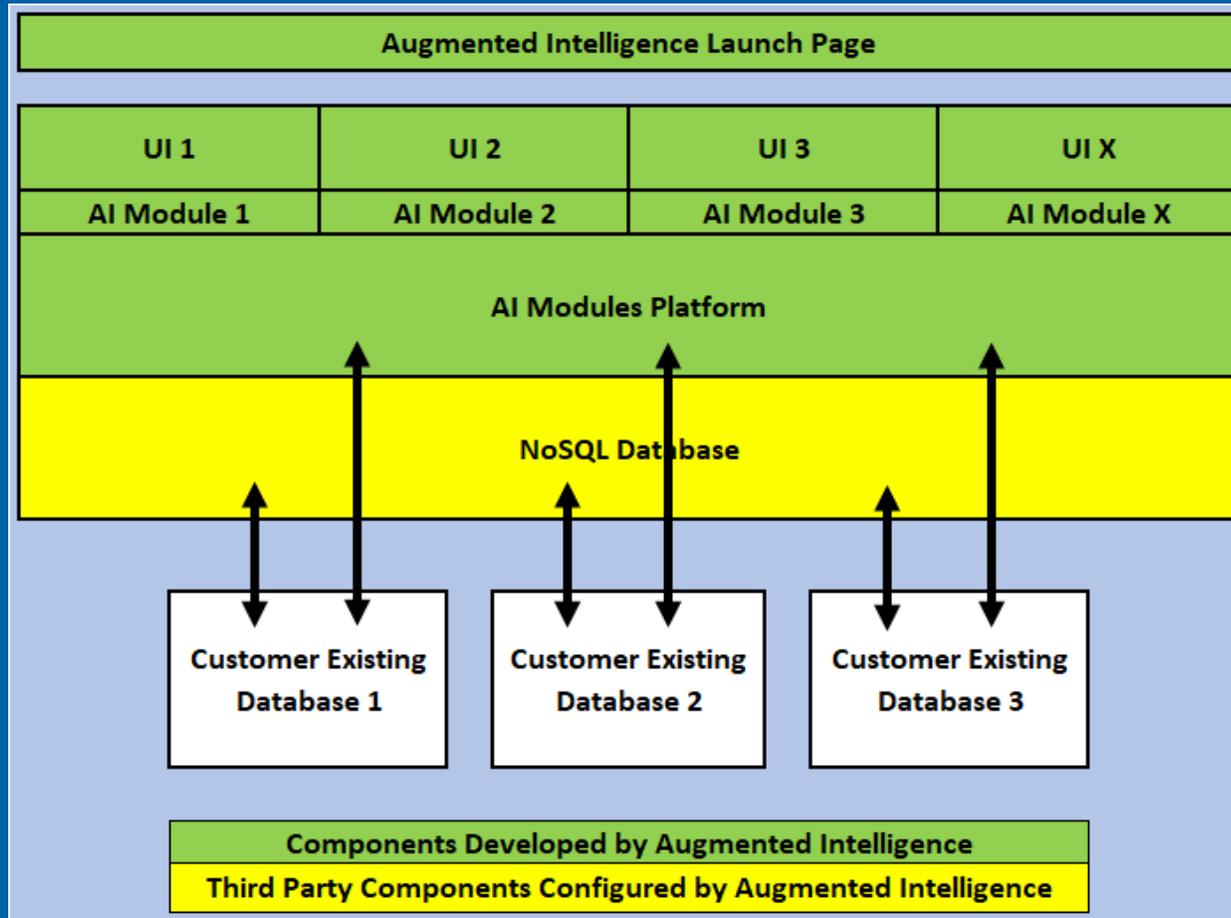
Fundamental to AI systems is the process of training the system to understand the context of the world in which it will be producing information.

In AI systems, key to the training process is access to domain-specific relevant historical narrative and structured data. Using publicly available narrative data sets that are commonly used for consumer-based AI applications, such as those from Wikipedia or Wall Street Journal, or even healthcare data, will not be sufficient.

The data sets that would be required are identified during the pilot scope discussions. Each AI pilot utilizes a limited subset of historical data, with controlled access provided.



DATA FLOW AND SECURITY



Security for Government: NIACAP, NiST 800-37, NIST 800-53, ICD 503, FIPS 140-2, HIPAA, SOX 302/404, FedRAMP, SSAE 16, EU 95/46/EC

Augmented Intelligence enters into a Business Associates' Agreement (BAA) with agencies at start of project.



DUPLICATE PID DISCUSSION

- To reduce duplication of Connections PIDs on a go forward basis, prior to creation of a new Person and PID in Connections, the AI application would search all applicable and available data including:
 - Connections person name, DOB and address histories
 - WMS case composition
 - FRM data
 - Voluntary agency SSPS/BICS submissions or other agency system exports
- From this search, the AI “Clearance” application would come up with a “duplicate person likelihood” score, with source data details that a local district user could see prior to creating a new PID.
- When a person-identifying value is updated, the application could alert local districts in real time that there is a high percentage that the person can be merged with an existing person.
- This approach could also be used to analyze the PID backlog.
- A similar approach could be used to unmerge records that have been incorrectly merged.
- Examples
 - US Census uses BigMatch (<https://www.census.gov/srd/csrreports/byrrc.html>)
 - Manufacturers screen for duplicate suppliers and customers in their ERP systems

