

Leveraging AI and Digital Engineering Technologies for RAM

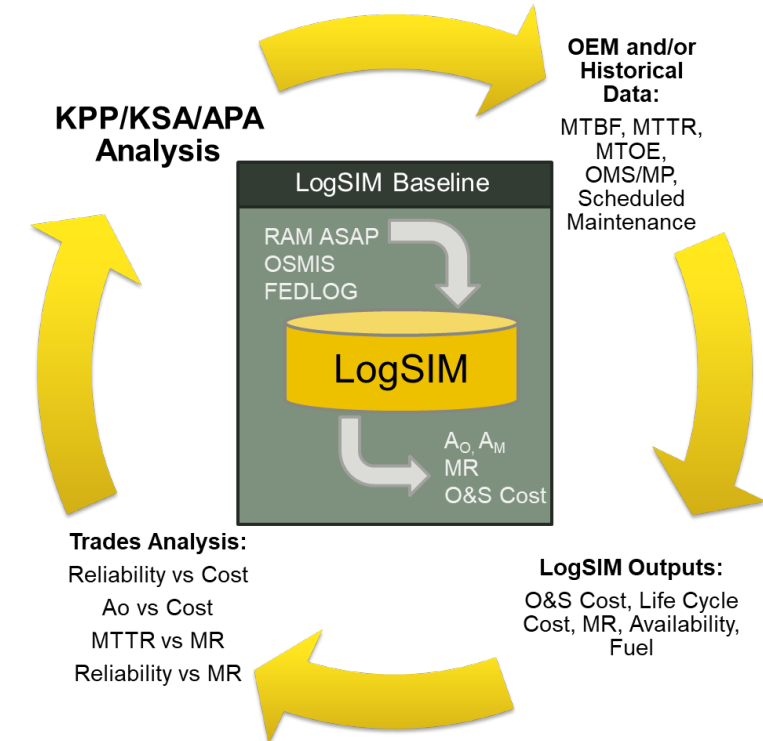
Dr. Philip Reiner
Reliant Technologies, Inc.
November 5, 2024

Agenda

- **Intro**
 - **LogLab**
 - **Digital Engineering in the LogLab**
 - **AI**
- **Practical Applications of AI**
 - **Baseline Case: Chat with your docs**
 - **Requirements Analysis/Evaluation**
 - **Structuring Unstructured Text**
 - **Document Tailoring**
 - **Querying Databases**
 - **Building Tools**
 - **Image Analysis**
- **Implementation Strategies**
- **Future Perspectives**
- **Conclusion**

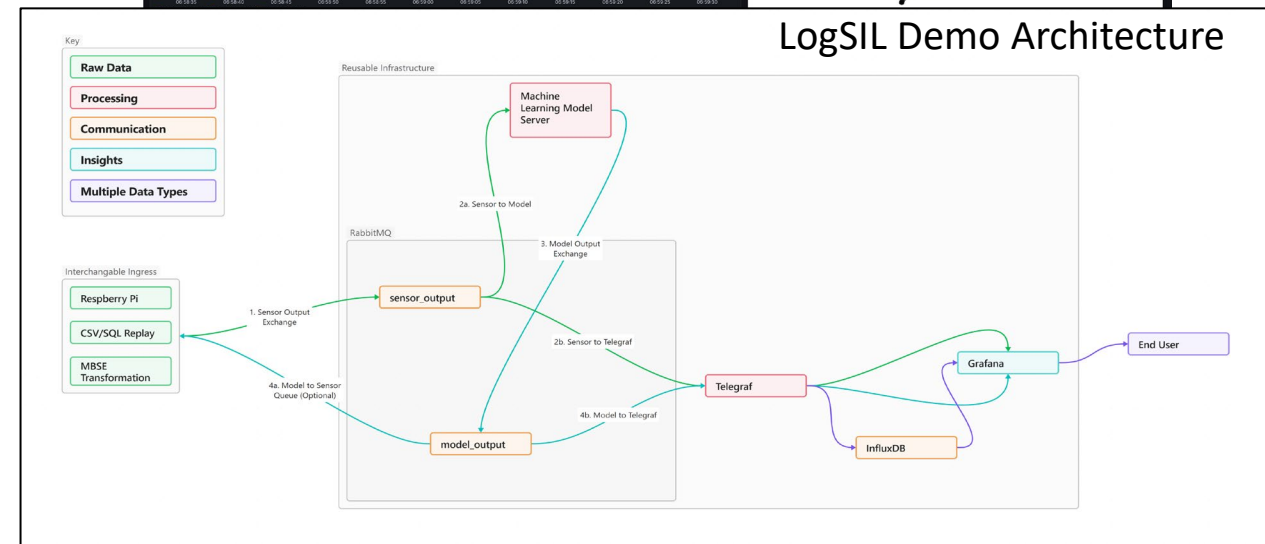
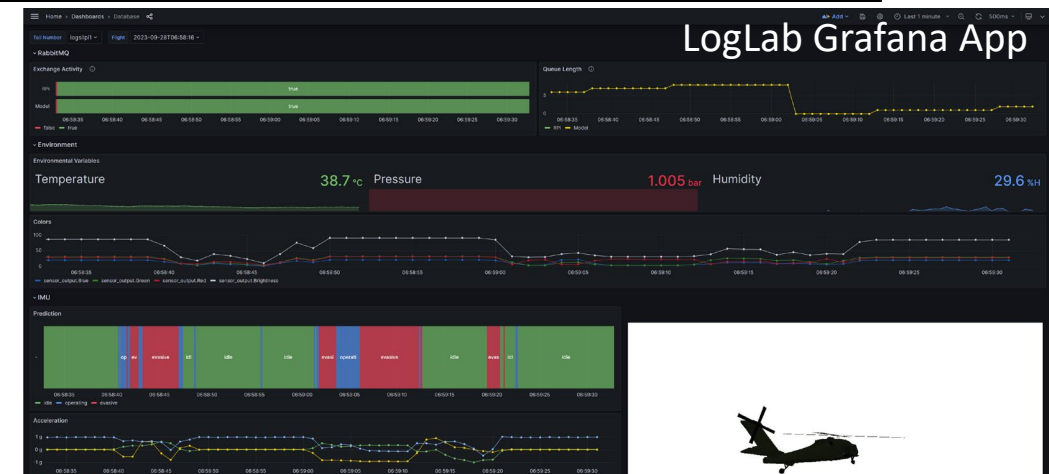
Who are we?

- The LogLab is a collaboration between logistics engineers and software engineers
- We act as a Government-owned sustainment think-tank providing analysis and insights into sustainment of future systems.
 - Influence design for sustainment
 - Identification of support gaps in fields of sustainment, supportability, reliability
 - Assessment of sustainment improvement/technologies
- We work directly with DEVCOM AvMC Log Engineering, RAM Engineering, ALC, AMCOM
- Hardware/Software modelling and simulation to emulate proposed aircraft data inputs, outputs, and infrastructure for analysis of future. maintenance concepts and digital engineering requirements.
- Documented technical approach for establishing hardware, software, data transfer/storage, and manning requirements for Future Vertical Lift (FVL) systems.
- FVL, Cross Functional Team (CFT), RAM, and LogLab will be granted access to compute infrastructure, models, and analysis.
- Potential partnerships include The Joint Artificial Intelligence Committee (JAIC), Enduring Fleet (UH, CH, AH) offices, Science and Technology (S&T), and others involved in Digital Twin development.



LogLab offers two main DE products

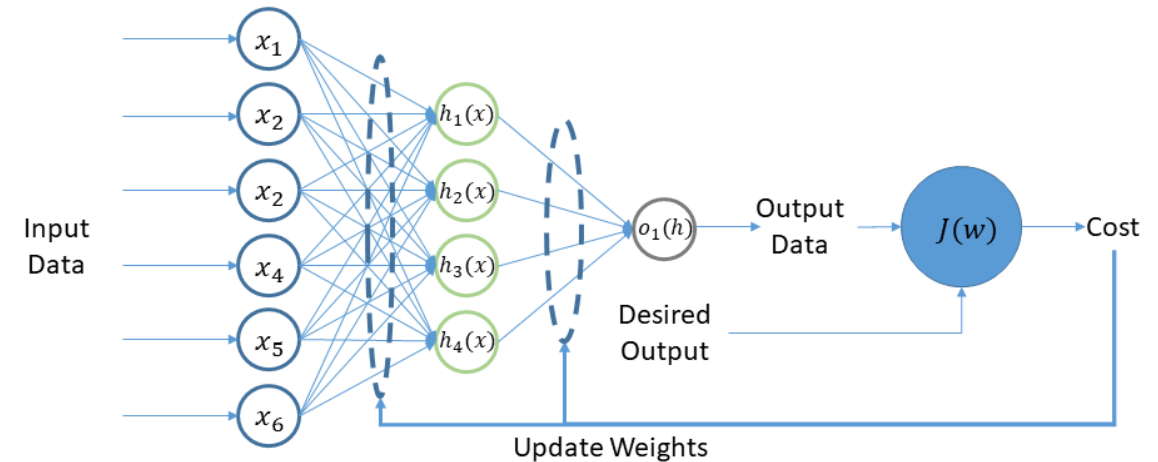
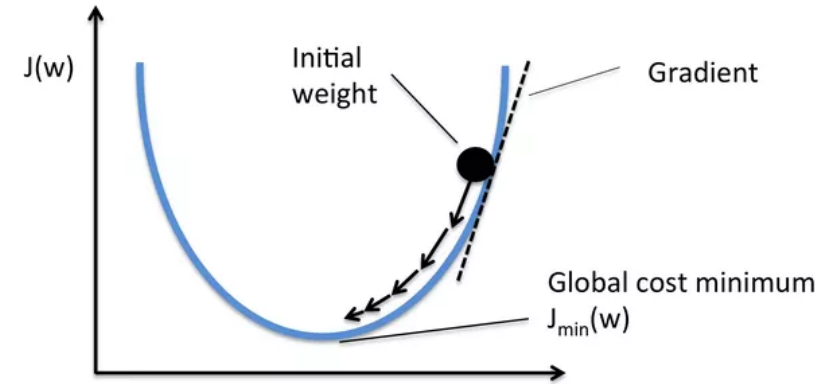
- Logistics simulation (LogSIM)
 - Discrete event simulation designed to simulate logistics operations of various deployments.
 - Used to provide insight into sustainment of future systems
- Logistics Systems Integration Lab (LogSIL)
 - Data Infrastructure Model – simulates communications across a network of various data types
 - Data can be streamed from various sources – from hardware components and/or software analogs
 - Data streams from real operations and/or simulated operations can be played through the network and stored.



Capabilities allow the LogLab to provide digital engineering capabilities to various customers helping inform their design for sustainment.

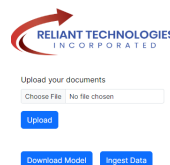
What is AI (more accurately, Machine Learning)?

- At the core, it's an optimization problem
 - Given a predefined set of computations with variable parameters (neural network), a set of input data (images, sensors, etc.), and a desired output (classification, forecasting, etc.), optimize the parameters of my computation network so the difference between the desired output of the model and the actual output of the model is minimized.
- Old Wave of ML
 - Basic Artificial Neural Networks
 - Basic tasks (classify this image, predict the next value in this sequence, map this data into a smaller dimensional space)
 - Relatively straight forward training (optimization)
- New Wave of ML
 - Multiple architecture types combined
 - Centered around integrating human language into ML inputs and outputs
 - More complex tasks (predict the next word in this sentence -> predict the next string in this line of code -> take a natural language input from a user, translate it to numbers for the machine, reason over the input and the possible outputs, translate results back to natural language or code or data, present to user)



Offline GPT AI Assistant prototypes

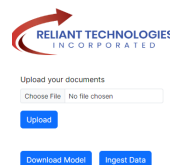
- LogLab developed a prototype Large Language Model (LLM) utilizing cutting edge open-source models trained on additional data
 - LogLab used GPU accelerated training to fine-tune base models to LogLab needs
- Tech document prototype model built by training models with technical documentation
 - Ability to interact with technical documentation
 - Ability to write with context from data repository
 - Model trained offline, so data can be contained within secure networks
 - Potential uses for training, document review, document writing
- Flight simulation prototype model built by training with simulated flight data
 - Ability to ask for sensor values at key time steps
 - Ability to perform basic calculations on values



User: Describe the SoSAT External Conditions model

2a: The SoSAT external conditions model allows for the altering of primary element aging rates and downtimes, personnel fatiguing rates, consumables usage and generation rates, and combat damage models due to defined environmental conditions.

Source: source_documents\SoSAT v3.0 Master Design Document.pdf



User: What is the SoSAT Footprint?

2a: Based on the context, the SoSAT Footprint appears to be a tool that calculates the logistic footprints of a SoSAT model. It allows users to import details from a SoSAT model and define user assumptions to create and assign systems that exist in SoSAT. The results can be viewed by system type, force structure, or final footprint roll up.

Source: source_documents\SoSAT v3.0 Master Design Document.pdf

External Conditions

Overview:

The SoSAT external conditions model provides the capability to alter primary element aging rates and downtimes, personnel fatiguing rates, consumables usage and generation rates, and combat damage models. External conditions can be used to model the effect of environmental conditions (e.g., sandstorms, extreme temperatures, etc.) and to alter the rates at which systems are used during a particular mission segment. SoSAT also has the capability to model multiple external conditions in a single mission segment. For example, a system may be assigned a new combat damage model at the same time that a heavy thunderstorm is affecting a system's electronics. The external conditions model is flexible and allows for additional detail to be represented in a system's mission scenario.

Assumptions:

- The occurrence of an external condition during a particular scenario segment is determined at the beginning of the simulation based on the probability of the external condition occurrence.
- If multiple external conditions are applied to a single element, the probability value of the altered property will be the base value multiplied by the product of all external condition multipliers assigned to this item.
- If an external condition is applied to a system and several elements on the external condition list are not defined for the system, then the system will only apply external condition values to those items that exist on the system.

Requirement Coverage:

Rqmt ID	Requirement Description
RQMT_263	SoSAT shall provide the capability to apply multiple external conditions to a given mission scenario segment.
RQMT_264	SoSAT shall multiply the product of all applied external conditions with the base value, if the base value has multiple external conditions applied.
RQMT_265	SoSAT shall apply external condition multipliers to modify system component behavior.
RQMT_266	SoSAT shall allow user designated combat loss change definitions to enable

Log FootPrint

SoSAT v3.0 Note: Log FootPrint was part of SoSAT v2.0 but is not included in SoSAT v3.0. Its design documentation, provided in the following sections, is maintained here for reference purposes.

Overview:

SoSAT-Footprint is a new addition to the SoSAT Tool Set that can calculate the logistic footprints of a SoSAT model. SoSAT-Footprint will allow the user to import details from a SoSAT model, define user assumptions, and create and assigns systems that exist in SoSAT. The results can be viewed by system type, force structure, or final footprint roll up.

Assumptions:

- The base SoSAT project file must be in version 2.0.0.12 format or newer.
- Weight calculations are represented in SoSAT-Footprint as short tons (STON). One STON is equivalent to 2,000 lb.
- Maximum capacity is used to calculate all inventory items to an assumed fully loaded inventory.
- Average total weight of a supply item for a system type is used as the total weight for the item in supply inventory for each system that is part of that system type.
- Meals Ready to Eat (MRE) that are required for each personnel (per day) are no longer calculated in the System Gross Weight as before in the footprint worksheet.

Requirements Coverage

Rqmt ID	Requirement Description
RQMT_917	SoSAT-Footprint shall allow the user to create a new project from an existing SoSAT project.
RQMT_918	SoSAT-Footprint shall allow the user to save logistic footprint details into the existing SoSAT project.
RQMT_919	SoSAT-Footprint shall be able to import system definitions from a SoSAT project.
RQMT_920	SoSAT-Footprint shall maintain the original SoSAT data from the existing SoSAT-Simulation Project.
RQMT_921	SoSAT-Footer shall be able to import structure definitions from a SoSAT

Prototypes demonstrate the possibility for the LogLab GPT to become the primary interface to the future Digital Engineering (DE) environment.

Practical Applications – Requirements Evaluation



Submission Evaluation and Analysis Prototype

AI assesses a very poor submission

User Evaluate Proposal

Overall Assessment

The proposal from the company exhibits a vague understanding of the project's objectives and requirements. The proposal lacks specific details and fails to provide a comprehensive plan to meet the objectives. While the company shows enthusiasm and a general idea of the project, it fails to offer a clear and detailed technical approach, commercialization strategy, and key personnel descriptions. Overall, this proposal needs to be significantly improved to meet the requirements of the Army SBIR.

- Fail: The proposal lacks details on the specific technical problem to be addressed and its importance. It only mentions that AI/ML deployment can increase aircraft lethality, safety, and mission effectiveness without specific details.
- Fail: The proposal does not enumerate the specific objectives of the Phase I work, nor the questions the research and development effort will try to answer to determine the feasibility of the proposed approach.
- Fail: The proposal does not provide an explicit, detailed description of the Phase I approach. The description "We will do some stuff" is insufficient.
- Fail: The proposal does not describe appropriate research activities which would commence at the end of Phase I base period should the Component elect to exercise the option.
- Fail: The Statement of Work section is not a substantial portion of the Technical Volume and lacks detailed information on planned tasks, work conduct, schedule of major events, and the final products to be delivered.
- Fail: The proposal does not describe significant activities directly related to the proposed effort, including any conducted by the proposing firm, consultants, or others.
- Fail: The proposal fails to describe how these activities interface with the proposed project and discuss any planned coordination with outside sources.
- Fail: The Technical Volume does not persuade evaluators of the proposer's awareness of the state of the art in the topic.
- Fail: The proposal does not state the anticipated results of the proposed approach if the project is successful.
- Fail: The proposal fails to discuss the significance of the Phase I effort in providing a foundation for a Phase II research or research and development effort.
- Fail: The proposal does not identify the applicable clearances, certifications and approvals required to conduct Phase II testing.
- Fail: The proposal does not describe in approximately one page the company strategy for commercializing this technology in DoD, other Federal Agencies, and/or private sector markets.
- Fail: The proposal lacks specific information on the market need the technology will address and the size of the market.
- Fail: The proposal does not include a schedule showing the quantitative commercialization results from the project that the company expects to achieve.
- Fail: The proposal does not provide a concise description of the principal relevant technical experience and its application to this topic.
- Fail: The proposal does not justify equipment purchases and does not include detailed pricing information in the Cost Volume.
- Fail: The proposal does not state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state, and local Governments.
- Fail: The proposal does not mention the involvement of a university or other subcontractors or consultants in the project.

Final Score: 1/10

AI assesses a bad submission

User Evaluate Proposal

Overall Assessment

The proposal provides a strong vision for the application of AI/ML technologies at the edge of aircraft systems. The proposed approach is technically sound and the team has relevant experience. However, the proposal falls short in providing specific information on market needs and size, detailed plan for commercialization, and fails to mention any previous work or awards related to the topic. Furthermore, there is a lack of detail in describing the methods for achieving each objective and the proposal lacks a detailed pricing information.

- Pass: The proposal correctly addresses the technical problem and provides a detailed approach for Phase I.
- Fail: The proposal does not provide detailed information on market need and size.
- Fail: The proposal does not provide a convincing commercialization strategy.
- Fail: The proposal does not mention any previous work, awards, or patents related to the topic.
- Fail: The proposal does not provide detailed methods planned to achieve each objective.
- Fail: The proposal does not include detailed pricing information.

Final Score: 4/10



AI assesses a marginally passing submission

User Evaluate Proposal

Overall Assessment

The proposal demonstrates an understanding of the technical problem at hand and has outlined a plan to integrate AI/ML algorithms with aircraft sensor systems. The company also shows a clear commercialization strategy and has identified key personnel with relevant experience to ensure the success of the project. However, there are areas where the proposal falls short of the specific requirements, specifically in detailing the specific tasks, schedule of major events, the final product to be delivered, and the methods to achieve each task.

- Pass: The proposal addresses the technical problem of integrating AI/ML algorithms with aircraft sensor systems, and the importance of this task.
- Pass: The company has identified the specific objectives of the Phase I work.
- Pass: The proposal provides a detailed description of the Phase I approach.
- Pass: The proposal outlines the appropriate research activities for the end of Phase I base period.
- Fail: The proposal does not provide a clear Statement of Work with planned tasks, a schedule of major events, and the final products to be delivered.
- Fail: The proposal does not explicitly discuss the methods planned to achieve each task.
- Pass: The proposal provides relevant technical experience and its application to this topic.
- Pass: The proposal outlines a clear strategy for commercializing the technology in DoD, other Federal Agencies, and private sector markets.
- Fail: The proposal does not provide specific information on the market need the technology will address and the size of the market.
- Fail: The proposal does not list any awards received, patents granted, or applications submitted for work related to this topic.
- Fail: The proposal does not list any publications relevant to this topic.
- Fail: The proposal does not justify equipment purchases or include detailed pricing information in the Cost Volume.
- Fail: The proposal does not state whether the facilities meet environmental laws and regulations of federal, state, and local Governments.
- Fail: The proposal does not mention the involvement of a university or other subcontractors or consultants in the project.

Final Score: 6/10

The GPT Prototype provides the ability to reason about CDRL submissions and provide scores based on requirements determined by the user

Practical Applications – Structuring Unstructured Text



GPT Structuring Unstructured Data Prototype

- LogLab developed a prototype Large Language Model (LLM) aimed at turning unstructured data into a structured format
 - LogLab used DID standard CDRL format as the output
- Simple example where an unstructured text description of a product is converted into a CDRL format
 - Ability to utilize a variety of formats
 - Ability to write with context from a document or data repository
 - Model trained offline, so data can be contained within secure networks
 - Potential uses for training, document review, document writing

The '1_DATA_ITEM_NO is 69 and the 2_TITLE_OF_DATA_ITEM of the cdrl is 'Chippers Chips'. With a '3_SUBTITLE': 'named after Chucks Dog' and '4_AUTHORITY_Data_Acquisit': of 'DI-MGMT-82165'. The CDRLS CONTRACT REFERENCE is Phillip Reiner from the REQUIRING OFFICE, FLRAA. The date of the first submission was 1 November and the subsequent submission was on 15 November. The estimated total price is \$1,000,000 which is grouped as high. We will do these reports every month and I want them prepared by Zeb freeman everytime. My name is Alden Moreton and I approve of this CDRL.

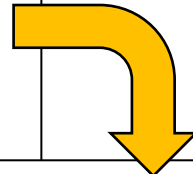
```
'7_DID_250_REQ': '444',
'8_APP_CODE': '222',
'DIST_STATEMENT': '33',
'11_AS_OF_DATE': date.today(),
'H_DATE': date.today(),
'J_DATE': date.today(),
```

This cutting-edge product, "Chippers Chips," is with precision and innovation, these chips bring them apart in the market. Named after Chuck's hearts, reflecting the bond between man and h and Blackhawk.

The authority for data acquisition, as per DI-MC information gathering. The commitment to excel reports, spearheaded by the talented Zeb Free 1st, is a testament to our dedication to providin

With an estimated total price of \$1,000,000, ca substantial return on investment. Phillip Reiner CDRLs contract reference, ensuring a seamles

As we embark on this journey, Alden Moreton v significance of "Chippers Chips." We look forward the monthly reports that will undoubtedly shape



CONTRACT DATA REQUIREMENTS LIST (1 Data Item)										Form Approved OMB No. 0704-0188		
<small>The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0701-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to the above address. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.</small>												
A. CONTRACT LINE ITEM NO.			B. EXHIBIT			C. CATEGORY: TDP _____ TM _____ OTHER _____						
D. SYSTEM/ITEM					E. CONTRACT/PR NO.			F. CONTRACTOR				
1. DATA ITEM NO. 69		2. TITLE OF DATA ITEM Chippers Chips					3. SUBTITLE named after Chucks Dog					17. PRICE GROUP
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-82165				5. CONTRACT REFERENCE Phillip Reiner			6. REQUIRING OFFICE FLRAA					18. ESTIMATED TOTAL PRICE 1,000,000.00
7. DD 250 REQ 444		9. DIST STATEMENT REQUIRED 33		10. FREQUENCY		12. DATE OF FIRST SUBMISSION 2021-11-01		14. DISTRIBUTION				
8. APP CODE 222		11. AS OF DATE 2021-11-30		13. DATE OF SUBSEQUENT SUBMISSION 2021-11-15		a. ADDRESSEE		b. COPIES				
						Draft		Final				
						Reg		Repro				
16. REMARKS												

Prototype demonstrates the possibility of taking notes, proposals, or other free flowing text documents and converting them to government accepted formats.

Tailoring Documents Based on Compliance and Security

- Customers in various offices have shown interest in the ability to take broad, comprehensive documents and tailoring those docs to specific customers based on security and compliance requirements
 - Example, A system purchased by India has different components and standards than one purchased by Poland
 - User would have to comb through a report template with all data in it and remove the parts that are irrelevant to each country individually
- LogLab built a prototype tool that takes in a standard report and tailors it based on a selected recipient and set of criteria
 - AI Tool edits each section of the report, removing terms as determined by the predefined criteria
 - Tool outputs the changes into a word doc and tracks the changes using the built in Word functionality
 - Users can review the tailored report in their usual document environment

1.0 (U) Introduction

The ~~Eswatini~~ Army Unpredictable Inventory Security Division (UIDS), led by ~~the~~ Commander ~~Thabo A~~ scrutinizing data from experiments, operations, and monitoring to evaluate the present and future ~~e~~ stockpile. These evaluations, ~~are~~ overseen by Chief Analyst Dr. Lindiwe Dlamini, ~~They~~ lay the ground improvements, aid in the investigation of mysterious occurrences, devise strategies for deployment reduce the likelihood of abrupt magnetization during solar flares, ~~events~~, and determine system lon alpine plants.

2.0 (U) Testing Authority

The ~~Eswatini~~ Army Unpredictable Inventory Security Division (UIDS) operates under the stringent ov ~~Assessments~~, a body entrusted with ultimate testing authority. This council is responsible for ensuri highest standards of precision and thoroughness. They mandate rigorous testing regimens, including storms and assessments of inventory items ~~such as the MK-19 plasma rifles and QZ-88 nanotech suil~~ anomalies. The council's unique approach includes the incorporation of esoteric methodologies, suc pattern analysis, to guarantee that ~~the~~ UIDS's operations remain at the forefront of both scientific ai

3.0 (U) Purpose of Report

The purpose of this report is to provide a comprehensive evaluation of the ~~Eswatini~~ Army Unpredict methodologies and findings. It aims to detail the rigorous testing protocols mandated by the Supren the effectiveness of the Division's unconventional approaches, and offer insights into the reliability ~~a~~ ~~critical components such as Part #XJ-42B7~~. The report seeks to ensure transparency, support strate security and performance ~~of the inventory~~.

Tailored Reporting

Editing Sections:

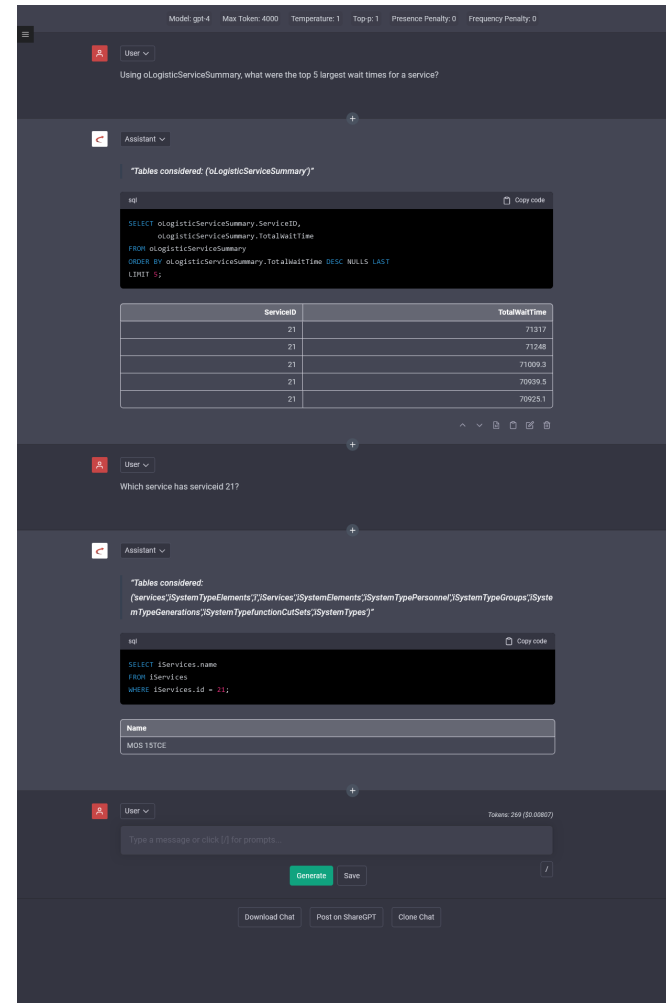
- (U) Introduction
- 1.1 (U) Testing Authority
- 1.2 (U) Purpose of Report
- 1.3 (CUI) Test Concept and Background
- 1.3.1 (CUI) Component Testing
- 1.3.2 (CUI) Flight Testing
- 1.3.3 (CUI) Surveillance Van Testing
- 1.3.4 (CUI) Missile Firing Data Reports (MFDRs)
- 1.4 (CUI) Method of Analysis
- 1.4.1 (CUI) Component Data
- 1.4.2 (CUI) Flight Test Data
- 1.4.3 (CUI) Surveillance Van Data
- 1.4.4 (CUI) MFDR Analysis
- 1.5 (CUI) Inventory
- (CUI) Component Testing
- 2.1 (CUI) Rocket Motor
- 2.1.1 (CUI) Static Fire
- 2.1.1.1 (CUI) Material Properties Testing
- 2.1.1.2 (CUI) Thermal Battery
- 2.1.2 (CUI) Electronic Safe, Arm and Fire Device
- 2.1.3 (CUI) Warhead
- 2.1.4 (CUI) Warhead
- 2.1.4.1 (CUI) Precursor Warhead
- 2.1.4.2 (CUI) Main Charge Warhead
- 2.1.5 (CUI) Accumulator
- 2.2.1 (CUI) Control Actuator Section
- 2.2.2 (CUI) Guidance Section
- (CUI) Flight Testing
- (CUI) Surveillance Van Testing
- (CUI) Missile Firing Data Reports
- (CUI) Cold Firing Recommendation
- (CUI) Conclusions



Prototype demonstrates the capacity to speed up a month-long process to mere minutes while the AI edits remain reviewable by a human user.

AI Database/Code Assistant Prototype

- LogLab developed a prototype Large Language Model (LLM) designed to interface with databases or other types of code platforms in Natural Language
- SQL Query Prototype built to showcase the possibility of interacting with databases and code tools in Natural Language
 - Ability to interact with SQL Database using English query
 - Ability to write code that works with a formatted backend (such as a SQL database)
 - Model developed using offline open-source model custom built for SQL writing tasks
 - Part of the multi-model architecture



Model: gpt-4 Max Token: 4000 Temperature: 1 Top-p: 1 Presence Penalty: 0 Frequency Penalty: 0

User
Using oLogisticServiceSummary, what were the top 5 largest wait times for a service?

Assistant
"Tables considered: (oLogisticServiceSummary)"

```
SELECT oLogisticServiceSummary.ServiceID,  
       oLogisticServiceSummary.TotalWaitTime  
FROM oLogisticServiceSummary  
ORDER BY oLogisticServiceSummary.TotalWaitTime DESC NULLS LAST  
LIMIT 5;
```

ServiceID	TotalWaitTime
21	71217
21	71248
21	71009.3
21	70939.5
21	70925.1

User
Which service has serviceid 21?

Assistant
"Tables considered: (services, SystemTypeElements, Services, SystemElements, SystemTypePersonnel, SystemTypeGroups, SystemTypeGenerations, SystemTypefunctionCutSets, SystemTypes)"

```
SELECT IServices.name  
FROM IServices  
WHERE IServices.id = 21;
```

Name
MOS 151CE

User
Tokens: 269 (50.0087)

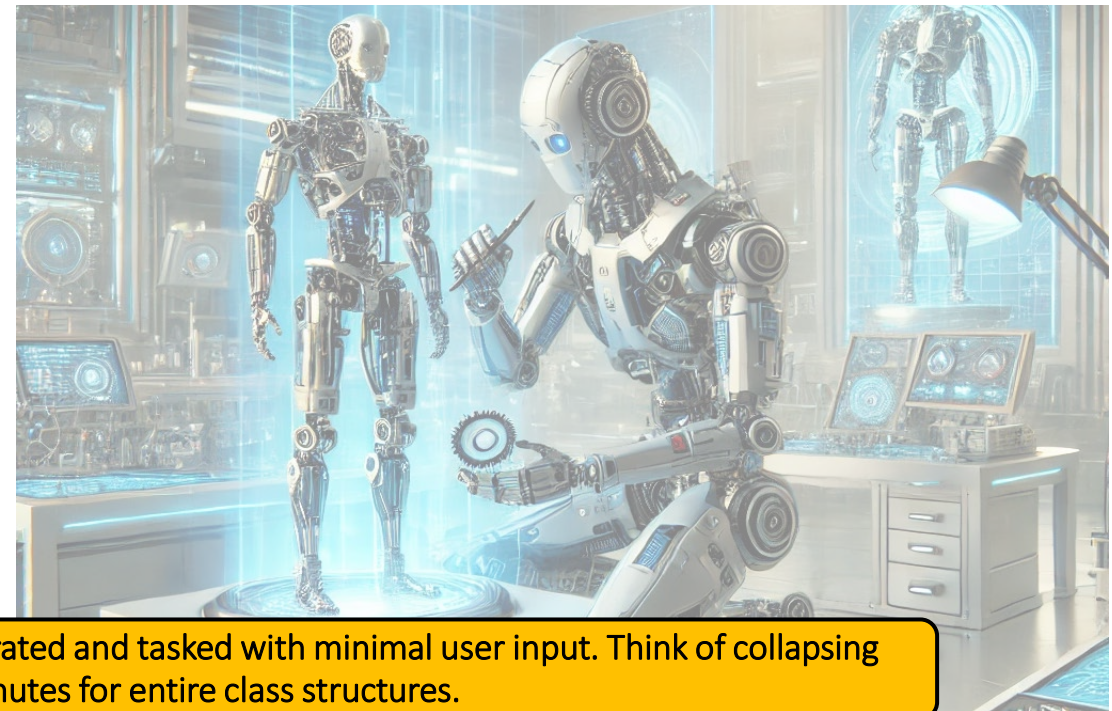
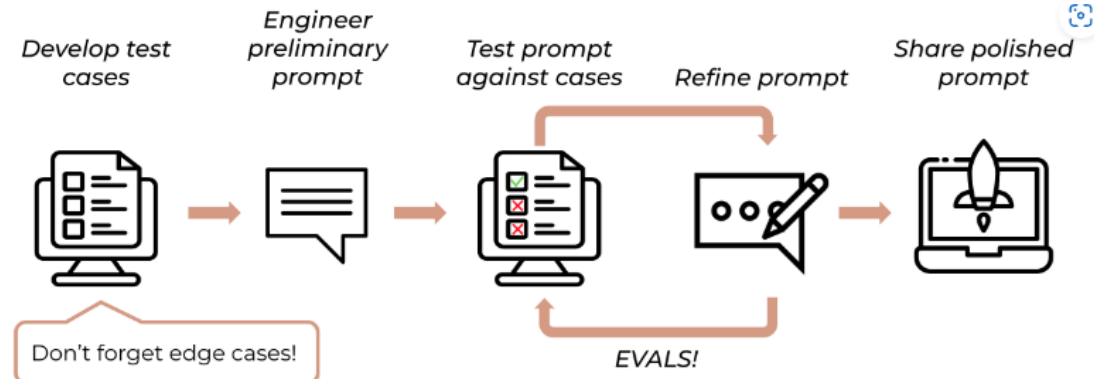
Generate Save

Download Chat Post on ShareGPT Clone Chat



Prototype demonstrates the possibility for the LogLab GPT to interface with specific tools which have specific formats and syntax.

- LogLab has been experimenting with agentic AI workflows using “metaprompts” and AI Assistants.
- What is a metaprompt?
 - A meta prompt is a prompt for an LLM which was developed to help the LLM write prompts for certain tasks.
 - A scaffolding which allows the AI tools to tell other AI tools what to do.
- Anthropic released a well rounded metaprompt for Claude 3 this Spring.
 - We fed the Claude metaprompt and the docs for Chat GPT-4 into Claude and asked it to generate a metaprompt for GPT-4.
 - From there we asked GPT-4 to refine the prompt for generating instructions for GPT Assistants.
 - Result – programmatic generation of AI assistants for a variety of tasks
- Examples:
 - Python software architect to generate classes with various functions
 - Python coder to fill in functions with code designed to perform various tasks
 - Web researcher which calls functions from a Python class to run web searches and add data to databases.

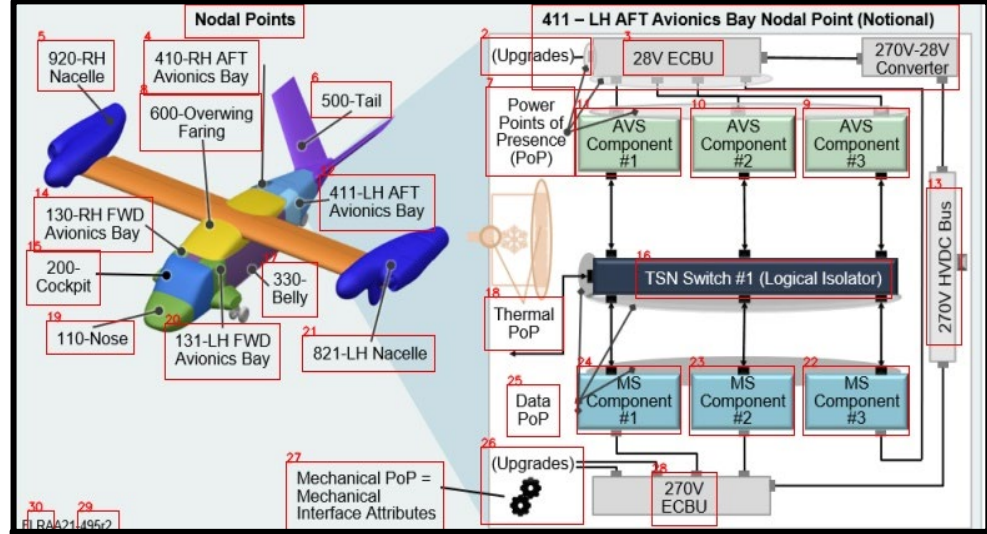


The Metaprompt prototype provides the ability for AI assistants to be generated and tasked with minimal user input. Think of collapsing your software development cycles down to minutes for entire class structures.



GPT Parsing and Comparing CDRL Revisions

- LogLab developed a parsing architecture designed to handle various CDRLs coming into the FLRAA program
 - LogLab used multiple parsing strategies to account for document content
 - Text and images parsed and stored in a database structure
- Model is then asked to compare multiple revisions of the same document for changes
 - Ability to summarize differences between doc revisions
 - Ability to determine if images in the doc were changed/updated
 - Model summarizes the changes and locations of changes
 - Potential uses for training, document review, document writing



METADATA:

- The author's name has changed from "S. Hepner" to "K. Price".
- The document name has been shortened to "Failure Mode, Effects".
- The report number has been changed, from "280-939-020" to "280-939-120".

Document Changes:

Revise Date (page 5): 6/20/2022 => changed to 7/20/2022

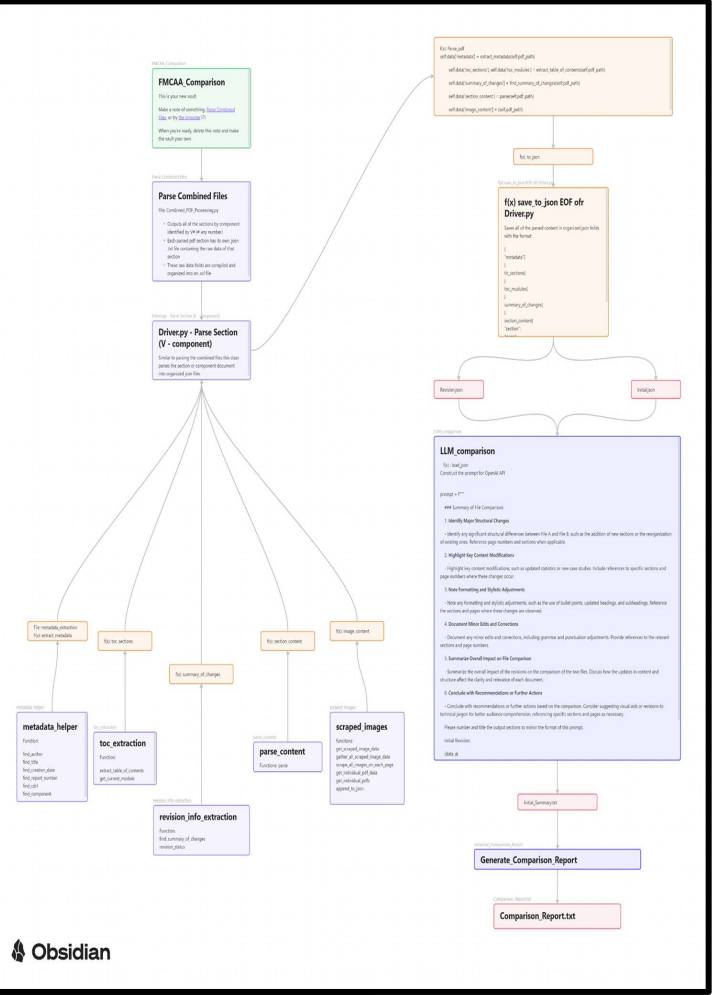
Additional changes:

Add new sub-section in the Definitions section (page 34):

"Criticality - Criticality refers to the ability of an item or occurrence to impact a p
higher
potential for project impact."

Edit Cost Factor Chart (page 47):

- Change legend title to "Cost Factor Levels".
- Add new category "Moderate Impact" with a value of 5.
- Increase the "Catastrophic Impact" value to



Prototype demonstrates the possibility of reducing the turnaround time for CDRL review.

Implementation Strategies

Building Trust

How do we use AI in a way where we can be sure the outputs are valid?

- Craft Your Use Cases Carefully – Choose small measurable tasks to tackle with AI.
 - Document Sorting
 - Structuring text
 - Data query
- Keep the human in the loop – Let the people have the final say.
 - Develop accept/reject mechanisms for AI outputs
 - Use real-world feedback to fine tune models
 - Don't tackle a job, tackle steps in a workflow
- Keep your data security in mind – Ensure the tools you deploy are appropriate for the domain.
 - Classified or Proprietary data MUST not be sent to commercial AI services

Minimizing Cost

Large-scale AI is incredibly expensive to train and maintain.

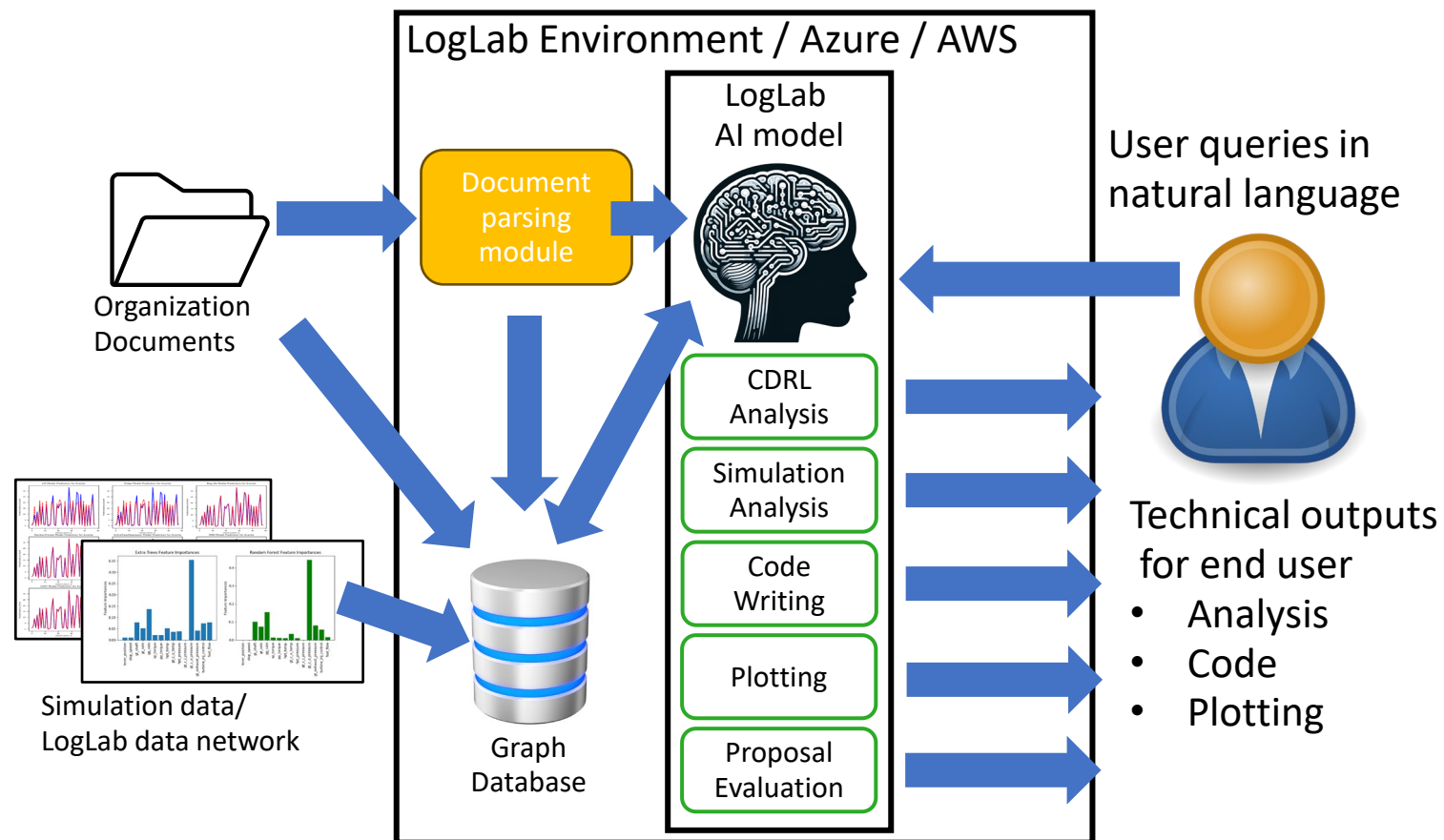
- Start small – Open-source models can be very performant for specific tasks.
 - Models used for small, specific tasks can run on less hardware
- Use all the tools available – Some commercial tools are very inexpensive to use on tasks with publicly available data.
 - Cloud deployments offer various levels of security and pay-as-you-go options.
- Make hardware purchases with extensibility in mind.
 - Think about how future funds can be used to build on available hardware rather than replace it.

Implementation should focus on practical benefits, trustworthy data management, and minimal cost

Future Perspectives

The Sum of these developing capabilities leads to radical digital transformation

- Imagine being able to access any of your organization's data with a simple query.
- Imagine asking AI to make variations of an established system model and analyze results.
- Imagine having requirements, vendor deliverables, and third-party analysis in the same place.
- Imagine being able to explore system requirements and their effects on key performance metrics as the system is developed.



Deliberate use of AI technologies will transform your Digital Engineering and Business workflows across the board.

Conclusion

AI Represents an incredible opportunity to increase productivity and reduce costs across a wide range of disciplines

- LogLab has piloted and developed proof of concept applications of AI which are actively assisting customers with their daily tasks
- AI Tools provide a previously unattainable democratization of data.
- AI Tools provide novel ways of knowledge management in an organization
- AI Tools provide a way to reduce time spent on tedious tasks
- AI Tools provide the key to digital transformation of your enterprise.

AI will be the key component of Digital Transformation efforts in the coming years.