

(See what we did there?!) 

# AI and Cost Estimation

Data Science's Expanding Role in Cost Estimating

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Special thanks to Greg Forman

# Overview



Purpose &  
Background



IT Trends



Application to  
Cost Estimation



AI Use Cases  
and Examples



Considerations  
and Caveats

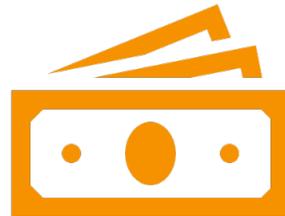


Resources

# Purpose



Provide basic overview of key AI concepts and developments



Introduce Applications of AI relevant to Cost Estimation



Initiate further study and discussion

# Presenters' Background

- Kevin and Dan have backgrounds and interests in cost estimation, automation, and in general finding more efficient ways to help our US DoD and federal sector clients make informed acquisition decisions
- Both worked for PRICE Systems (now Unison) in the 2000s, and have worked for a variety of leading Cost Engineering firms (Dan: MITRE, Wyle, Booz Allen; Kevin: MCR, TASC, Logapps)
- Kevin and Dan presented on the topic of Artificial Intelligence (AI), Generative AI and Cost Estimating at the 2023 and 2024 International Cost Estimating and Analysis Association Annual Workshops
- Presented to Project Controls Expo, Boehm Center for Software Estimating Annual Research Review, the AI/ML Working Group hosted by DHS Cybersecurity and Infrastructure Security Agency (CISA), the Annual Comptrollers' Conference and Training & Development Forum hosted by the Canada's National Defence Costing Community Development team, and local ICEAA Chapter meetings



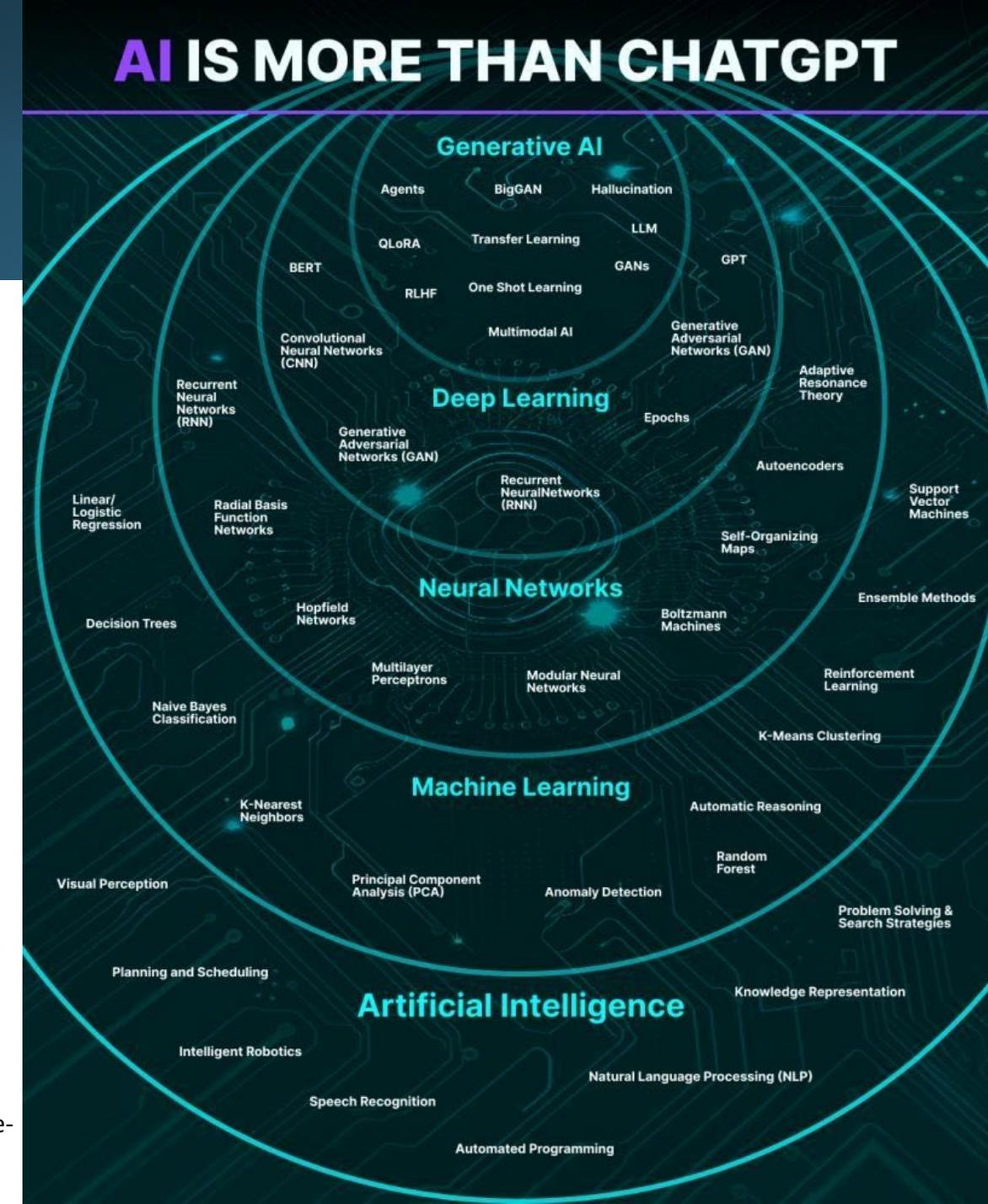
# Poll Question

**Have you every used an AI tools such as ChatGPT for any purpose?**

- a. Yes**
- b. No**

# AI is MORE than ChatGPT via Generative AI

- The graphic to the right provides an excellent picture of several AI Domains



# Key AI Terms and Definitions

- **Artificial Intelligence (AI)** | “The science and engineering of making intelligent machines, especially intelligent computer programs” – John McCarthy
- **Machine Learning (ML)** | Algorithms that can learn from and make predictions or decisions based on data
  - **Artificial Neural Networks (ANN)** | Class of ML algorithms designed to conceptually mimic the neural network (neurons and synapses) in the brain.
- **Expert Systems** | rule-based systems that make decisions and solve problems in a specific domain
- **Natural Language Processing (NLP)** | a subfield of AI focused on the intersection of linguistics, computer science, information engineering, and the interactions between computers and human languages
- **Generative Adversarial Networks (GAN):** Type of Deep Learning model that can generate new combinations of output, such as images or text, from data it has been trained on – ChatGPT, DALL-E, Stable Diffusion are examples



# IT Trends

- Data generated by individuals, businesses and governments is increasing exponentially
- AI is currently most powerful technology for tackling big data challenges, but implementation historically complex and resource intensive
- As AI capabilities grow, and barriers of implementing AI solutions are reduced, more domains will be integrated with or rely on some form AI
- Recently popularized “Generative” AI models pave the way more intuitive general purpose AI abilities, enabling widespread use by the general public, potentially accelerating investment and innovation
- Models like DALL-E (OpenAI) and Stable Diffusion (CompVis) disrupting industries once considered well insulated from AI, such as digital art and music
- ChatGPT (OpenAI) “fastest-growing consumer internet app ever” – 100 Million users in 2 months!

# IT Trends-ChatGPT



- ChatGPT is a NLP tool driven by AI technology that allows you to have human-like conversations and much more with a chatbot. The language model can answer questions, and assist you with tasks such as composing emails, essays, and code. It's "Google on crack"
- Chat GPT 3.5 is currently free (<https://openai.com/chatgpt/pricing>), while GPT-4 is \$20/month, which includes DALL-E
- OpenAI's CEO, Sam Altman was fired then hired in November 2023 due disagreements with Board of Directors on future vision of Gen AI
- *How big a deal is ChatGPT?*
- It's certainly made a big splash. "ChatGPT is scary good. We are not far from dangerously strong AI," said Elon Musk, who was one of the founders of OpenAI before leaving. Altman tweeted that ChatGPT had more than 1 million users in its first five days after launching.
- According to analysis by Swiss bank UBS, ChatGPT is the fastest growing app of all time. In January, only two months after its launch, UBS analysis estimates that ChatGPT had 100 million active users. For comparison, it took nine months for TikTok to reach 100 million.



**How will AI tools such as ChatGPT impact cost estimation and acquisition?**

# Poll Question

**How will AI tools such as ChatGPT impact cost estimation and acquisition?**

- a. No impact whatsoever**
- b. No impact for the next 5 years or so**
- c. Moderate Impact**
- d. Significant Impact**
- e. I'll lose my job!**

# IT Trends: Chatbot (LLM) Market Leaders

Gen AI



- **Version:** GPT-4
- **Ownership:** OpenAI
- **Funded By:** Microsoft
- **Launched** Nov 2022
- **Position:** Market Leader
- 1M users in first five days. 180M Users in March 2024
- **Features:** Chatbot, content creation, coding assistant, image generator
- **Knowledge Cut off:** Dec 2023
- **Context Window:** 128K
- **API monthly cost** : \$10/1M input token; \$30/1M output token
- **User monthly cost:** \$20

Claude



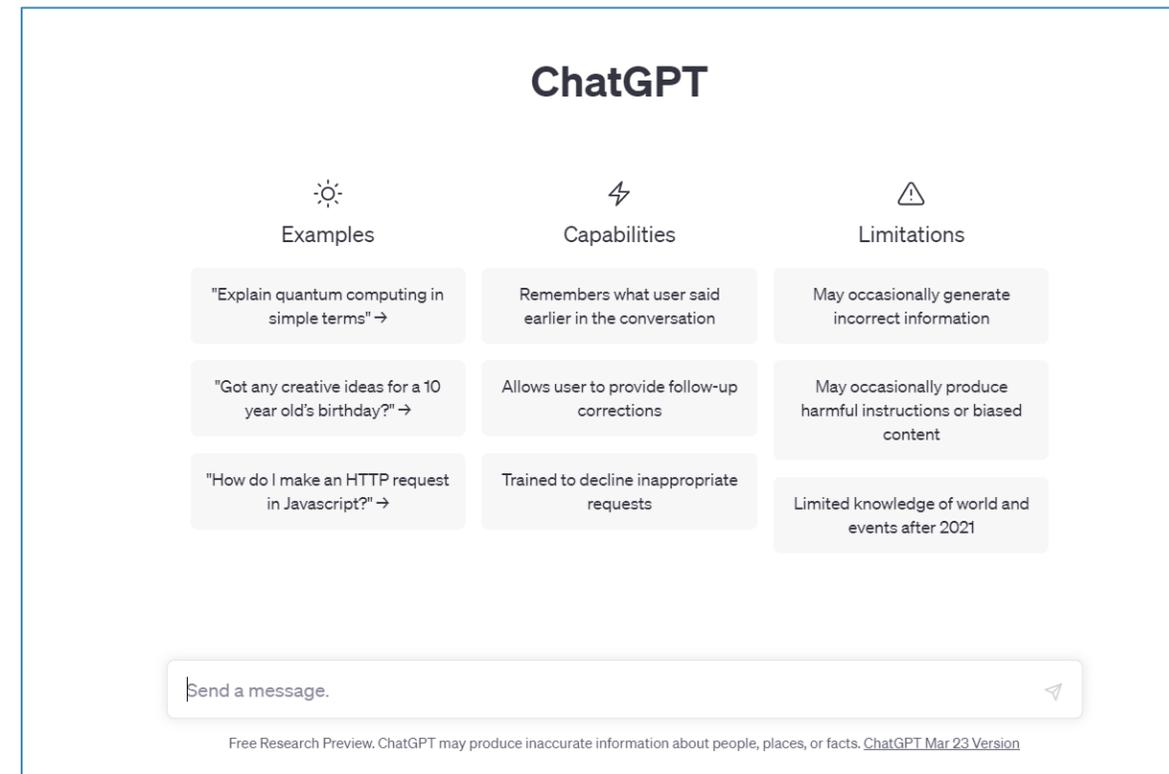
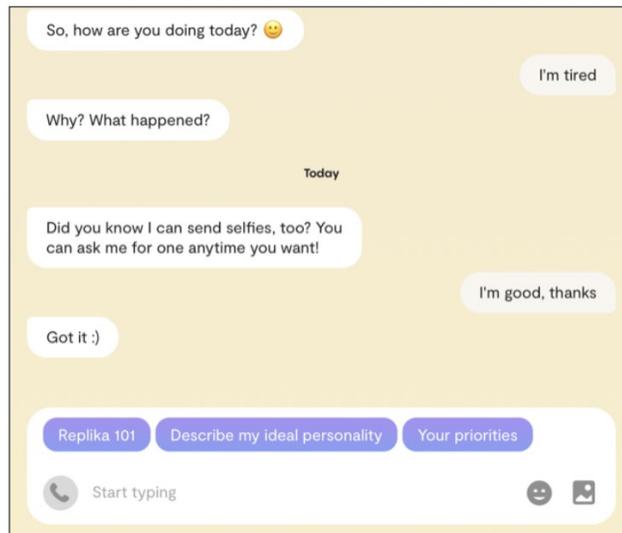
- **Version:** Claude 3
- **Ownership:** Anthropic
- **Funded by:** Amazon, Google, Salesforce
- **Launched:** Mar 2023
- **Position:** Very competitive
- **Features:** OCR, coding assistant, creative writing, ethical AI development
- **Knowledge Cut off:** Aug 2023
- **Context Window:** 200K
- **API Monthly price:** \$15/1M input token; \$75/1M output token
- **User monthly cost:** \$15

Gemini

- **Version:** 1.5 Pro
- **Ownership:** Google
- **Replaces** Bard, Duet AI, Google Assistant
- **Launched:** Mar 2023 (rebranded Feb 2024)
- **Position:** Failed to Deliver but its Google
- **Features:** Chatbot, voice assistant, coding assistant, video processing
- **Knowledge Cut off:**
- **Context Window:** 128K
- **API Monthly price:** \$7/1M input token; \$21/1M output token
- **User Monthly cost:** \$20

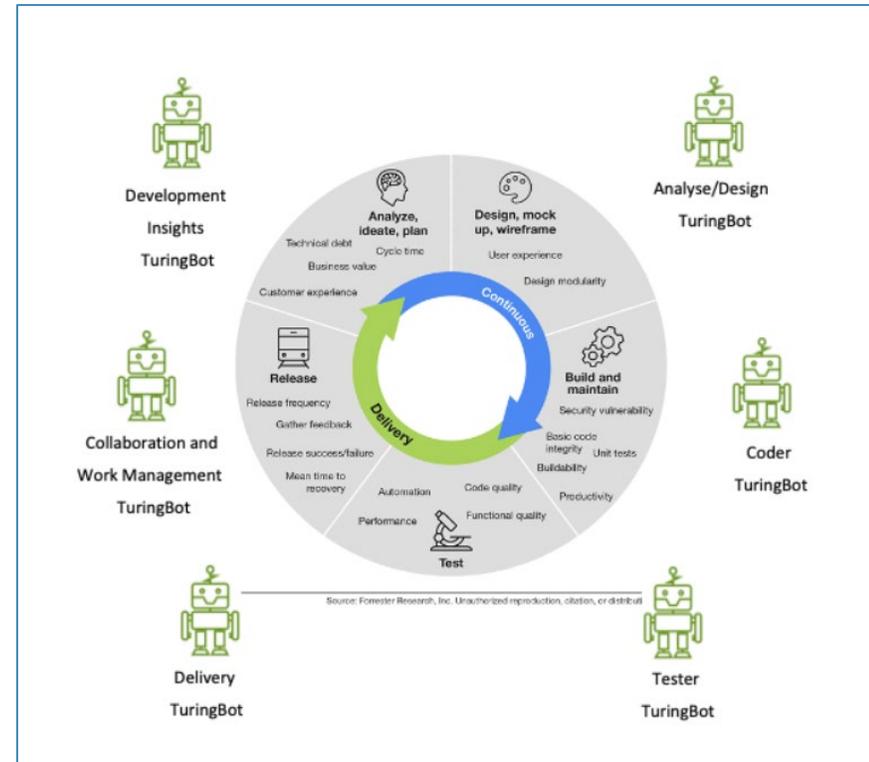
# ChatGPT & Beyond

- **OpenAI has brought to market ChatGPT, GPT-4 and DALL-E2**
  - ChatGPT is a prototype AI chatbot released in November 22, available free of charge
  - GPT-4 is the next generation of Chat GPT as a subscription-based service and via API service (token pricing)
  - DALL-E 2 utilizes deep learning to generate images
- Numerous competitors have entered Generative AI market
  - Google Bard
  - GitHub Copilot
  - WriteSonic
  - Replica



# IT Trends-ChatGPT-Application to Software Development

- Generative code development will change how software is developed
- ChatGPT supports over 50 programming languages
- Limitation is that it does not reside within IDE
- TuringBOTS
  - Term coined by Forrester describe generative AI-powered software such as Copilot or ChatGPT that helps developers code from the planning stage to the testing and deployment stage.
  - It defines what analysts believe is a major technology trend, giving birth to a new generation of software development.
  - Software vendors and federal Contracting Officers will have to manage generative code tools



"ChatGPT is good at providing clear, natural-language suggestions or for getting started with and using a new programming language," said Diego Lo Giudice, principal analyst with Forrester Research. "But [developers] also use it to generate code from English prompts to document existing code, to get a clear explanation of a program or to translate from a programming language to another -- asking about APIs, libraries, parameters to use in coding and more."

# IT Trends: Chatbot (LLM) Market Leaders

	Claude 3 Opus	Claude 3 Sonnet	Claude 3 Haiku	GPT-4	GPT-3.5	Gemini 1.0 Ultra	Gemini 1.0 Pro
Undergraduate level knowledge <i>MMLU</i>	86.8% 5-shot	79.0% 5-shot	75.2% 5-shot	86.4% 5-shot	70.0% 5-shot	83.7% 5-shot	71.8% 5-shot
Graduate level reasoning <i>GPQA, Diamond</i>	50.4% 0-shot CoT	40.4% 0-shot CoT	33.3% 0-shot CoT	35.7% 0-shot CoT	28.1% 0-shot CoT	—	—
Grade school math <i>GSM8K</i>	95.0% 0-shot CoT	92.3% 0-shot CoT	88.9% 0-shot CoT	92.0% 5-shot CoT	57.1% 5-shot	94.4% Maj1@32	86.5% Maj1@32
Math problem-solving <i>MATH</i>	60.1% 0-shot CoT	43.1% 0-shot CoT	38.9% 0-shot CoT	52.9% 4-shot	34.1% 4-shot	53.2% 4-shot	32.6% 4-shot
Multilingual math <i>MGSM</i>	90.7% 0-shot	83.5% 0-shot	75.1% 0-shot	74.5% 8-shot	—	79.0% 8-shot	63.5% 8-shot
Code <i>HumanEval</i>	84.9% 0-shot	73.0% 0-shot	75.9% 0-shot	67.0% 0-shot	48.1% 0-shot	74.4% 0-shot	67.7% 0-shot
Reasoning over text <i>DROP, FI score</i>	83.1 3-shot	78.9 3-shot	78.4 3-shot	80.9 3-shot	64.1 3-shot	82.4 Variable shots	74.1 Variable shots
Mixed evaluations <i>BIG-Bench-Hard</i>	86.8% 3-shot CoT	82.9% 3-shot CoT	73.7% 3-shot CoT	83.1% 3-shot CoT	66.6% 3-shot CoT	83.6% 3-shot CoT	75.0% 3-shot CoT
Knowledge Q&A <i>ARC-Challenge</i>	96.4% 25-shot	93.2% 25-shot	89.2% 25-shot	96.3% 25-shot	85.2% 25-shot	—	—
Common Knowledge <i>HellaSwag</i>	95.4% 10-shot	89.0% 10-shot	85.9% 10-shot	95.3% 10-shot	85.5% 10-shot	87.8% 10-shot	84.7% 10-shot

- What are LLMs?
- What type of scientific problems can they solve?

## An AI rival to ChatGPT passed a university level law and economics exam, and did better than many humans, professor says

[Sawdah Bhaimiya](#) Jan 19, 2023, 10:02 AM EST

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An AI financed by Sam Bankman-Fried just passed a law and economics exam. Kilito Chan/Getty Images

# Generative AI in 2024

- 2023 was the year ChatGPT exploded. 2024 will bring Gen AI to more specific use cases
- Technology
  - Google Bard operates as competitor to chat GPT at no cost, and integrates with Google tools
  - GitHub Co-Pilot: offers automated code development, generates code snippets and enhances developer productivity
- Graphics and art production
  - DALL-E: image generation from text prompts
  - Jasper and Writesonic: creates long-form content like blog articles, scripts, outlines, and more.
  - Fireflies: provides meeting note-taking and transcription
  - Adobe Sensei: Adobe's own generative AI models allow for seamless photo, audio, and video editing
  - Fliki: converts text into audio files and video to simplify the creative process behind videos, podcasts, or audiobooks in 1,000 voices and 75 languages
  - MusicLM by Google: currently in R&D, will allow to create music from text
- Business workflow
  - Summarize.tech: input a video link, and tool will generate text summary
  - Jasper and Writesonic: creates long-form content like blog articles, scripts, outlines, and more.
  - Fireflies: Provides meeting note-taking and transcription services
- AI Threats
  - Bad actors can gain access to user accounts
  - Fraudulent push payment requests from pay applications
  - Financial markets can be influenced by AI algorithms

# Application to Cost Estimation

## Will impact what is estimated:

- AI impact to private and public sector operating costs?
- How do estimators reflect these changes in estimates?
- What areas will be impacted? How soon?

## Will impact how we estimate:

- New ways of collecting data and performing cost research
- AI augmented estimation workflows
- AI powered insights and recommendations

# Potential Applications in Cost Estimation

**Streamlining cost research:** AI assisted cost research offers potentially more intuitive and interactive information gathering, leveraging immense datasets, including data sourcing

**Predictive modeling:** Algorithms can be trained on historical data to predict future costs for a project or product, taking into account factors such as materials, labor, and overhead

**Process automation:** AI can be used to further automate cost estimation processes, reducing the time and resources required to perform cost analysis

**Optimization:** AI algorithms can be used to optimize cost estimates, exploring different scenarios and trade-offs to find the most cost-effective solution

**Risk analysis:** AI can be used to assess the risk of cost overruns and identify the key factors that contribute to cost variability, allowing organizations to make more informed decisions

**Supply chain management:** AI can be used to analyze the cost of goods, services, and resources required to deliver a product or service, helping organizations to identify opportunities for cost savings.

# Use Cases

- **Use Case 1: WBS QA**
  - Technology: Excel and ChatGPT
  - Usage: WBS or any kind of numbering creation/QA
  - Reference: next slide
- **Use Case 2: Labor Rate Lookup**
  - Technology: PromptLoop function, GPT function
  - Usage: Excel, Google Sheets, Google Docs
  - Reference: <https://sheetgpt.ai/articles/how-to-start-using-sheetgpt-in-a-google-sheet>
- **Use Case 3: Functional Size Measurement**
  - Technology: NLP
  - Usage: Cadence
  - Reference: <https://logapps.com/cadence/>
- **Use Case 4: ChatGPT as SME**
  - Technology: Generative AI
  - Usage: OpenAI
  - Reference: <https://openai.com/>
- **Use Case 5: BOE Documentation, CES creation**
  - Technology: ChatGPT
  - Usage: Excel, Google Sheets, Google Docs
  - Reference:
- **Use Case 6: Analyze FEMA Disaster Relief Data**
  - Technology: ChatGPT
  - Usage: Excel
  - Reference:
- **Use Case 7: Writing Macros**
- **Use Case 8: Testing**
- **Use Case 9: Built-in AI in Excel**
  -

# Use Case 1: WBS QA

## QA of ever-changing WBS 1000+ rows in workbook

CES ID	Cost Element Name
0.2	Census Engineering
0.2.1	Technology Engineering
0.2.1.1	Technology Engineering Management
0.2.1.1.1	IT Strategy & Roadmap
0.2.1.1.2	IT Solution Requirements Management
0.2.1.1.3	IT Engineering Methods, Processes, and Practices
0.2.1.1.4	IT Program Management Office
0.2.1.1.4.1	Program Cost Management
0.2.1.1.4.2	Flicense
0.2.1.1.4.3	Program Schedule Management
0.2.1.1.4.4	Program Quality Management
0.2.1.1.4.5	Program Resource Management
0.2.1.1.4.6	Program Communications Management
0.2.1.1.4.7	Program Risk Management
0.2.1.1.4.8	Program Procurement Management
0.2.1.1.4.9	Program Stakeholder Engagement
0.2.1.2	Technology Research and Acquisition
0.2.1.2.1	Technology Research
0.2.1.2.2	Technology Acquisition
0.2.1.2.4.1	Pre-award
0.2.1.2.4.2	Award
0.2.1.2.4.3	Post-award
0.2.2	Solution Architecture and Security
0.2.2.1	Solution Architecture
0.2.2.1.1	Application Architecture
0.2.2.1.2	Cloud Architecture
0.2.2.1.3	Integration Architecture
0.2.2.1.4	Data Architecture



Census WBS.xlsx  
Spreadsheet

Please check my numbering in the attached. It's a work breakdown structure. highlight any numbering errors.



I've loaded your Work Breakdown Structure (WBS) data from the Excel file. Now, I'll analyze the numbering to identify any inconsistencies or errors. I'll check for gaps or incorrect sequencing in the structure. Let's proceed with that analysis. [↩]

It looks like there was an issue with handling some of the numbers in your WBS, possibly because some entries might be formatted as numbers directly rather than as text. I'll adjust the handling to ensure all data is treated as text and then recheck the numbering for any errors. Let's fix that and continue. [↩]

It appears that there are some entries in your WBS that could not be processed, possibly due to missing or 'NaN' values. I'll adjust the processing to ignore such entries and recheck the numbering to highlight any errors. Let's make this adjustment. [↩]

It seems there are still issues processing the data, likely due to unexpected 'nan' values not being properly filtered. I will ensure all non-numeric entries are appropriately handled and then recheck the numbering. Let's correct this and proceed. [↩]

I've identified a few numbering errors in your Work Breakdown Structure:

1. There is a jump from '0.2.1.2.2' to '0.2.1.2.4.1'.
2. There is a jump from '0.2.3.2.2.1' to '0.2.3.5.2.1.1'.
3. There is a jump from '0.2.3.1.9.1.3' to '0.2.3.5.9.2'.
4. There is a major section jump from '0.2.3.14.3.5' to '0.7'.

These jumps suggest that there are missing intermediate steps or subsections in these areas. You may want to review these parts of your WBS to ensure that the structure is sequentially and logically consistent. [↩]

# Use Case 2: Using AI in a Spreadsheet: Labor Rate Lookup

Part 1/3

**Goal:** Find the labor rate based in column 'C' based on the labor category in column 'B'

- User creates a prompt by populating two columns:
  1. List labor categories
  2. Rates associated with those labor categories
- AI analyzes the user entered subset and generates rates for the missing labor categories

PromptLoop ☆ 📁 ☁

File Edit View Insert Format Data Tools Extensions

100% | \$ % .0 .00 123 | Default (Ari...

fx =PROMPTLOOP(B2:B6,C2:C6,B7)

A	B	C
	Systems Engineer	\$130.00
	Systems Architect	\$145.00
	Computer Systems Analyst	\$135.00
	Customer Service Representative	\$88.00
	Database Administrator	\$95.00
	Information Security Analyst	120
	Computer Systems Administrator	135
	Software Developer	135
	Web Developer, Senior	170

User entered

AI generated

# Use Case 2: Using AI in a Spreadsheet: Labor Rate Lookup

Part 2/3

**Modified Goal:** Lookup average hourly rates based on location

A	B	C	D
average hourly wage in	alabama	average hourly wage in alabama	The average hourly wage in Alabama is \$17.45, according to the Bureau of Labor Statistics.
average hourly wage in	georgia	average hourly wage in georgia	The average hourly wage in Georgia is \$17.90, according to the Bureau of Labor Statistics.
average hourly wage in	new york	average hourly wage in new york	The average hourly wage in New York is \$25.90, according to the Bureau of Labor Statistics.
average hourly wage in	florida	average hourly wage in florida	The average hourly wage in Florida is \$17.90, according to the Bureau of Labor Statistics.
average hourly wage in	michigan	average hourly wage in michigan	The average hourly wage in Michigan is \$20.90, according to the Bureau of Labor Statistics.

**Note that at this time the source information has been provided in the AI output and can be validated**

# Use Case 2: Using AI in a Spreadsheet: Labor Rate Lookup

Part 3/3

## Observations and limitations:

- Many unknowns for output rate
  - Location, experience?
  - Fully burdened (overhead, etc.)?
  - What timeframe?
- Validation
  - Compare a known set of rates to AI generated

The screenshot shows a Google Sheet titled "PromptLoop" with a menu bar (File, Edit, View, Insert, Format, Data, Tools, Extensions) and a toolbar. The formula bar displays the formula `=PROMPTLOOP(B2:B6,C2:C6,B7)`. The spreadsheet data is as follows:

A	B	C
	Systems Engineer	\$130.00
	Systems Architect	\$145.00
	Computer Systems Analyst	\$135.00
	Customer Service Representative	\$88.00
	Database Administrator	\$95.00
	Information Security Analyst	120
	Computer Systems Administrator;	135
	Software Developer	135
	Web Developer, Senior	170

# Use Case 3: NLP-Aided SW Estimating

Cadence is a SAAS application developed by LOGAPPS to review and improve software requirements and estimate functional software size.

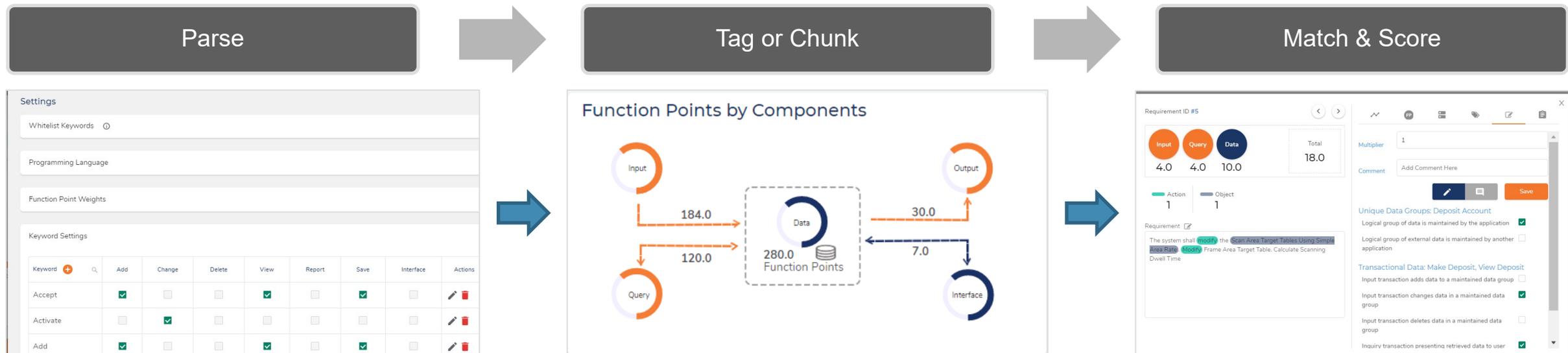


Version 2.0 is developed around a core NLP capability and a robust rules engine that aims to mitigate weaknesses in the estimation process.



# Use Case 3: NLP-Aided SW Estimating

- Parsed requirements is used as input for functional sizing
  - Specific words or phrases are mapped to IFPUG data or transactional functions
  - Business rules are applied
  - Analyst evaluates and adjusts as needed
  - ROM-level software sizing produced, which then supports estimation or benchmarking activities
- Interfaces with JIRA and Office
  - **Functional sizing for large projects can be completed in minutes!**



# Use Case 4: ChatGPT as SME

what is the process to create a cost estimate to stand up a help desk?

The process to create a cost estimate to stand up a help desk involves several steps:

1. Define the scope of the project: Determine the size and type of help desk that is needed, including the number of staff required, the level of support to be provided, and the types of technology needed to support the help desk.
2. Determine the staffing needs: Estimate the number of staff required to run the help desk, including the number of agents, supervisors, and managers. This can be based on the expected volume of calls or requests, as well as the required level of service.
3. Estimate the technology costs: Identify the hardware and software needed to run the help desk, including computers, phones, ticketing systems, and other tools. Research the cost of purchasing or leasing the necessary equipment and software.
4. Estimate the training costs: Determine the cost of training the help desk staff, including initial training and ongoing training to ensure that they are able to provide the necessary level of support.
5. Estimate the facilities costs: Determine the cost of leasing or renovating a space to house the help desk, including rent, utilities, and other associated costs.
6. Create a detailed estimate: Based on the information gathered in the previous steps, create a detailed estimate of the costs for standing up the help desk, including staffing, technology, training, and facilities costs.
7. Review and refine the estimate: Review the estimate with the project team and make any necessary adjustments. It's important to take into account contingencies and any potential unknown costs that may arise during the implementation process.

It's important to note that cost estimates are not exact figures, they are a projection of the costs of the project, and actual costs may vary.

what is the hourly labor rate for a help desk worker?

The hourly labor rate for a help desk worker can vary depending on various factors such as location, level of experience, and industry.

According to data from the US Bureau of Labor Statistics, as of May 2020, the median hourly wage for computer user support specialists, which includes help desk workers, was \$25.16 per hour in the United States. The lowest 10% of earners made less than \$16.67 per hour, while the highest 10% earned more than \$42.06 per hour.

However, it's important to note that these figures are median wages and may vary based on different factors. Additionally, some companies may offer benefits or bonuses on top of the hourly rate, which can also impact the overall compensation package.

how many employees work for an average help desk support group:

The number of employees who work for an average help desk support group can vary widely depending on the size and complexity of the organization, the volume of calls or requests received, and the level of support required.

In general, smaller organizations may have only a few help desk support staff members, while larger organizations may have dozens or even hundreds of help desk support staff members. According to industry surveys and research, the average help desk support group may range from 3 to 20 staff members, but this number can vary widely depending on the organization's needs.

The number of employees required may also depend on the level of support provided. For example, a help desk that provides basic support for a few software applications may require fewer employees than a help desk that provides more advanced technical support for a wide range of applications and devices.

Ultimately, the number of employees needed for a help desk support group will depend on a variety of factors unique to each organization, and should be determined based on the specific needs and goals of the organization.

- **With just 3 chats, I was able to use ChatGPT as a “SME:”**
  - Received detailed process for estimating help desk costs
  - Low/average/high Hourly rate for Help Desk Staff
  - FTE counts

# Use Case 5: ChatGPT for IT CES/WBS

o Create a work breakdown structure for software development and maintenance



Creating a complete work breakdown structure (WBS) for software development and maintenance can be quite extensive, but I can provide a high-level overview to get you started. Keep in mind that the WBS can vary depending on the project's complexity, methodology, and specific requirements. Here's a simplified example:

- Project Initiation**
  - Define project scope and objectives
  - Gather initial requirements
  - Identify stakeholders
- Planning**
  - Create a project plan
  - Develop a project schedule
  - Define roles and responsibilities
  - Risk assessment and mitigation planning
- Analysis and Design**
  - Requirements gathering and analysis
  - System architecture design
  - User interface design
  - Database design
- Development**
  - Coding and programming
  - Unit testing
  - Integration testing
  - Version control
- Quality Assurance**
  - System testing
  - User acceptance testing
  - Bug tracking and resolution
  - Performance testing
- Deployment**
  - Deployment planning
  - Installation and configuration
  - User training
  - Data migration
- Maintenance and Support**
  - Regular updates and patches
  - Bug fixes and troubleshooting
  - Performance monitoring
  - User support and helpdesk
- Documentation**
  - User manuals
  - Technical documentation
  - Knowledge transfer
- Project Management**
  - Project status reporting
  - Change management
  - Resource allocation
  - Budget tracking
- Closure**
  - Final acceptance and sign-off
  - Post-implementation review
  - Documentation archive
  - Lessons learned

- Created “Level 2” basic IT WBS
- Using the iterative nature of ChatGPT, asked for a Level 3 WBS
- <https://chat.openai.com/c/856d11ff-a801-4e40-ac56-97acf9bde659>



Certainly! Breaking down the work breakdown structure (WBS) for software development and maintenance into the next level of detail:

- Project Initiation**
  - Define project scope and objectives
    - Conduct stakeholder interviews
    - Create a project charter
  - Gather initial requirements
    - Identify high-level functional requirements
    - Identify non-functional requirements (e.g., performance, security)
  - Identify stakeholders
    - Compile a list of project stakeholders
    - Define their roles and responsibilities
- Planning**
  - Create a project plan
    - Develop a project scope statement
    - Define project milestones
  - Develop a project schedule
    - Create a Gantt chart
    - Allocate resources and estimate durations
  - Define roles and responsibilities
    - Assign project roles (e.g., project manager, developer, tester)
    - Outline responsibilities and reporting structures
  - Risk assessment and mitigation planning
    - Identify project risks
    - Develop risk mitigation strategies
- Analysis and Design**
  - Requirements gathering and analysis
    - Conduct detailed user interviews and surveys
    - Create a comprehensive requirements document
  - System architecture design
    - Develop system architecture diagrams
    - Define system components and their interactions
  - User interface design
    - Create wireframes and mockups
    - Develop user interface prototypes
  - Database design
    - Design the database schema
    - Define data relationships and entities
- Development**
  - Coding and programming
    - Write code based on design specifications
    - Follow coding standards and best practices
  - Unit testing
    - Develop unit test cases
    - Execute unit tests on individual components
  - Integration testing
    - Integrate components and test interactions
    - Identify and address integration issues
  - Version control
    - Implement version control system (e.g., Git)
    - Manage code repositories and branches
- Quality Assurance**
  - System testing
    - Create comprehensive test plans
    - Execute tests to validate system functionality
  - User acceptance testing
    - Involve users to validate system usability

Regenerate

# Use Case 5: ChatGPT for IT CES/WBS

- Created “Level 3” basic WBS for IT



Create a work breakdown structure for information technology



Creating a work breakdown structure (WBS) for information technology (IT) can be broad and complex, as IT encompasses a wide range of activities and projects. Below is a simplified WBS for IT that you can further customize to fit the specific requirements and projects within your IT department or organization:

## 1. IT Strategy and Planning

- Develop IT strategic plan
- Define IT governance framework
- Conduct technology assessments
- Establish IT policies and standards

## 2. Infrastructure Management

- Network infrastructure
  - Design and maintain network architecture
  - Configure routers, switches, and firewalls
- Server infrastructure
  - Provision and maintain servers
  - Implement virtualization solutions
- Data center management
  - Manage data center facilities
  - Implement disaster recovery and backup solutions
- Cloud services
  - Evaluate and manage cloud providers
  - Migrate to cloud-based solutions

## 3. Software Development

- Requirements gathering and analysis
  - Collaborate with stakeholders to define software needs
  - Document functional and non-functional requirements
- Application design and development
  - Design software architecture
  - Code and develop applications
- Testing and quality assurance
  - Develop and execute test plans
  - Conduct user acceptance testing
- Deployment and release management
  - Deploy software to production environments
  - Manage software releases and updates

## 4. Cybersecurity

- Security assessment and planning
  - Identify security risks and vulnerabilities
  - Develop a security strategy and policies
- Network security
  - Implement firewalls, intrusion detection systems, and encryption
  - Monitor network for security breaches
- Data security
  - Protect sensitive data through encryption and access controls
  - Conduct regular security audits and assessments
- Incident response and recovery
  - Develop an incident response plan
  - Investigate and mitigate security incidents

## 5. End-User Support

- Helpdesk and user support
  - Provide technical assistance to end-users
  - Resolve hardware and software issues
- Training and education
  - Develop training materials and programs
  - Educate users on best practices and IT policies
- Device management
  - Manage and maintain end-user devices (computers, mobile devices)
  - Install and update software and applications

## 6. Database Management

- Database design and modeling
  - Design and create database schemas
  - Define data relationships and entities
- Database administration
  - Ensure database performance and availability
  - Backup and recovery
- Data integration and reporting
  - Integrate data from various sources
  - Develop and maintain reporting solutions

## 7. Project Management

- Project initiation and planning
  - Define project objectives and scope
  - Develop project plans and schedules
- Project execution and monitoring
  - Manage project resources and tasks
  - Monitor project progress and budget
- Project closure
  - Ensure project deliverables are met
  - Conduct post-project evaluations and documentation

## 8. IT Procurement and Vendor Management

- Procurement planning
  - Identify hardware and software needs
  - Develop procurement strategies
- Vendor selection and management
  - Evaluate and select IT vendors
  - Manage vendor contracts and relationships
- Asset management
  - Track and manage IT assets (hardware, software licenses)

## 9. Business Continuity and Disaster Recovery

- Business impact analysis
  - Assess critical business processes and dependencies
  - Identify recovery time objectives (RTO) and recovery point objectives (RPO)
- Disaster recovery planning
  - Develop a disaster recovery plan
  - Test and update the plan regularly
- Backup and data preservation
  - Implement backup and data preservation strategies
  - Ensure data integrity and availability during disasters

## 10. IT Compliance and Governance

- Regulatory compliance
  - Ensure compliance with industry and government regulations
  - Conduct audits and assessments
- IT governance
  - Establish IT governance structures
  - Define roles and responsibilities for IT stakeholders

# Use Case 6: Analyze FEMA Disaster Relief Data

- Please clean up the data in this Excel workbook

Region	Reference	Date	Name	Valu
US West	219/4/jh	5/21/2021	DAN	5100
	88/DCNA/01	5/26/2021	bill	2368
	366/FAD/9	5/27/2022	fRed	1145
	1035/JLZ/3	3/12/2021	Joe	4561
	12/UAR/69	1/26/2021	jOE	2534
	26/rst/4	9/27/2022	Ted	69
AFRICOM	1902/faa/5	9/21/2021	juanita	3256
	83/FAP/6	1/2/2021	iSabelle'	1278
	711/MTX/8	4/27/2022	Lisa	1200
	15/MTX/0		LUCy	1439



You

Please clean up the data in this Excel workbook



ChatGPT

The workbook contains one sheet named 'Sheet1'. Let's load the data from this sheet and take a quick look at the first few rows to understand what kind of cleaning might be needed. [↔]

The data from 'Sheet1' has been loaded, but it seems there are a few issues that might need addressing:

1. **Column Headers:** The first row contains what appears to be the column headers, but they are not recognized as such.
2. **Missing Data:** There are missing values in the 'Region' column.
3. **Inconsistent Data:** The 'Name' column has names in different cases (e.g., 'DAN', 'bill', 'fRed').
4. **Data Types:** The 'Date' column should likely be in a date format, and 'Valu' seems to be a numerical column but may be read as text.

I will proceed with the following steps unless you have specific requests:

1. Set the first row as the header.
2. Fill missing values in the 'Region' column (need more information on how you want this handled).
3. Normalize the 'Name' column to have consistent casing (e.g., title case).
4. Ensure the 'Date' column is in the correct date format.
5. Convert 'Valu' to a numerical data type if it's not already.

# Use Case 6: Analyze FEMA Disaster Relief Data



- FEMA produces these PDF reports quarterly for the public
- Includes thousands of disaster-related expenses for everything from satellite radios to forklift rentals
- What if we could easily analyze that data as a tool for estimating future disaster recovery costs?
- “It would take too long unless I can get an overhead number to research it....” Appendix 1. List of all disaster-related contracts and micropurchase actions issued during FY 2020 Q1

## Disaster Contracts Quarterly Report

First Quarter, Fiscal Year 2020

May 6, 2020  
Fiscal Year 2020 Report to Congress



Federal Emergency Management Agency

Number	CONTRACT/ORDER NUMBER	Modification Number	OBLIGATED AMOUNT	CONTRACTOR	Date Signed	Completion Date	Ultimate Completion Date	State: Event	Description of Requirement	REASON NOT COMPLETED
1	70FA3018C00000003	P00024	\$392,213.00	Gordian Group, Inc., The	10/29/2019	1/9/2020	1/9/2021	4339DR	RS MEANS FOR PA - CONSOLIDATION OF LICENSES	Only One Source - Other (FAR 6.302-1 other)
2	HSHQDC13DE2018 / 70FA3019F00000356	P00039	\$81,993.12	Global Tech Inc.	11/20/2019	5/31/2020	5/31/2020	4339DR	INFORMATION SYSTEMS SECURITY OFFICER	Completed
3	HSFE3016A0201 / 70FA3019F00000549	P00002	\$0.00	Inmarsat Government, Inc.	11/27/2019	9/26/2019	9/26/2019	72205U DRF-SURGE-DISASTR SUPRT ACCTS-PRE-DECLARE/MOBILZTN	SATELLITE VOICE SERVICES HURRICANE DORIAN	Completed
4	70FA3018D00000003 / 70FA3019F00000633	P00006	\$68.33	VERIZON WIRELESS	10/8/2019	1/7/2020	1/7/2020	4404DR	TO ADD INTERNATIONAL FEATURE TO ONE IPHONE DEVICE IN SUPPORT OF DR4404MP	Completed
5	70FA3018D00000003 / 70FA3019F00000633	P00013	\$330.49	VERIZON WIRELESS	12/9/2019	1/7/2020	1/7/2020	3425EM	TO ADD INTERNATIONAL FEATURE TO TWO IPHONES AND ONE MIFI DEVICES IN SUPPORT OF 3425EM TYPHOON BUALOI	Completed
6	HSFE3016A0201 / 70FA3019F00000670	P00001	\$0.00	Inmarsat Government, Inc.	11/26/2019	10/2/2019	10/2/2019	3419EM	SATELLITE VOICE SERVICES HURRICANE DORIAN	Completed
7	HSFE3016D0203 / 70FA3020F00000002		\$8,752.18	VERIZON FEDERAL INC.	10/8/2019	12/8/2019	12/8/2019	4461DR	TELECOMMUNICATION SERVICES IN SUPPORT OF DR-4461-IL  LOCAL TELECOMMUNICATION EQUIPMENT AND SERVICES TO SUPPORT FEMA INFRASTRUCTURE NATIONWIDE (CONUS AND OCONUS), WHICH WILL ENABLE THE AGENCY CHARGED WITH THE CENTRALIZED DIRECTION OF EMERGENCY MANAGEMENT TO FULFILL ITS MISSION.	Only One Source - Other (FAR 6.302-1 other)
8	HSFE3016A0201 / 70FA3020F00000003		\$487.20	Inmarsat Government, Inc.	10/21/2019	12/20/2019	12/20/2019	4337DR	SATELLITE PHONES	Completed

# Use Case 6: Analyze FEMA Disaster Relief Data

- I could copy paste to excel and then fix errors by hand or perhaps using macros/automation
- Could convert using Adobe or free Ilovepdf.com

Provided 10 standardized categories

**You**

fema\_-\_disaster\_contracts\_quarterly\_re... PDF

analyze this

**ChatGPT**

The document you've uploaded, titled "FEMA - Disaster Contracts Quarterly Report - First Quarter FY 2020," provides an overview and detailed data on the contracts executed by the Federal Emergency Management Agency (FEMA) during the first quarter of the fiscal year 2020. Here's an analysis of the key elements:

### Executive Summary:

- **Purpose:** This report, mandated by Title VI of the FY 2007 Department of Homeland Security Appropriations Act, details contracts entered into using disaster funds that were procured non-competitively.
- **Methodology:** Data was collected from FEMA's Procurement Information System for Management (PRISM) and cross-validated with the Federal Procurement Data System - Next Generation (FPDS-NG).
- **Contracting Overview:** FEMA reported 917 contract actions totaling \$403,940,779. Out of these, 576 were disaster-related with a total value of \$270,852,713. Non-competitive disaster-related contracts made up 14% of total actions, with a value of \$10,275,763 (approximately 2.5% of the total contract dollars spent).

### Detailed Findings:

- **Contract Distribution:** A significant portion of the contracts were related to disaster recovery, emphasizing FEMA's focus on quick procurement during emergencies.
- **Non-competitive Contracts:** Specific reasons for non-competition were documented, such as urgent need, the uniqueness of service, or in cases where only one source was available. This aligns with federal regulations that allow for non-competitive procurement in specific circumstances.

### Appendices:

- **Appendix 1:** Lists all disaster-related contracts and micropurchase actions issued, detailing contractor names, contract values, and specific reasons for non-competitive procedures.
- **Appendix 2:** Covers amendments and updates to previously unreported contract actions from the last quarter of FY 2019.
- **Appendix 3:** Provides definitions and justifications for non-competitive procurement methods used, enhancing transparency and accountability.

Analysis: ↓

**You**

create standard categories for the costs provided

**ChatGPT**

To create standard categories for the costs outlined in the FEMA Disaster Contracts Quarterly Report, it's important to consider the nature of the services and goods provided, the procurement context (especially in disaster-related scenarios), and the reporting requirements for transparency and accountability. Here's a proposed categorization based on common themes in government procurement, particularly in emergency management:

### 1. Telecommunication Services

- **Description:** Costs associated with providing telecommunication services, including satellite phones, data services, and other communication infrastructure essential during disaster responses.
- **Typical Entries:** Satellite voice services, local telecommunication equipment and services.

### 2. IT and Security Services

- **Description:** Expenditures related to information technology and security, including cybersecurity services, IT support, and security systems maintenance and installation.
- **Typical Entries:** Information systems security, IT network equipment, FEMA security systems installation.

### 3. Logistics and Infrastructure

- **Description:** Includes all costs related to logistical support and infrastructure setup, such as transportation, warehousing, and other logistical arrangements.
- **Typical Entries:** Transportation services, warehousing costs.

### 4. Professional Services

- **Description:** Fees paid for expert advice and operational support, including legal, consulting, and project management services.
- **Typical Entries:** Legal services, consulting fees, project management.

### 5. Construction and Engineering Services

- **Description:** Costs related to construction and engineering, including repairs, construction management, and engineering services.
- **Typical Entries:** Construction projects, engineering services, repair works.

### 6. Medical Services and Supplies

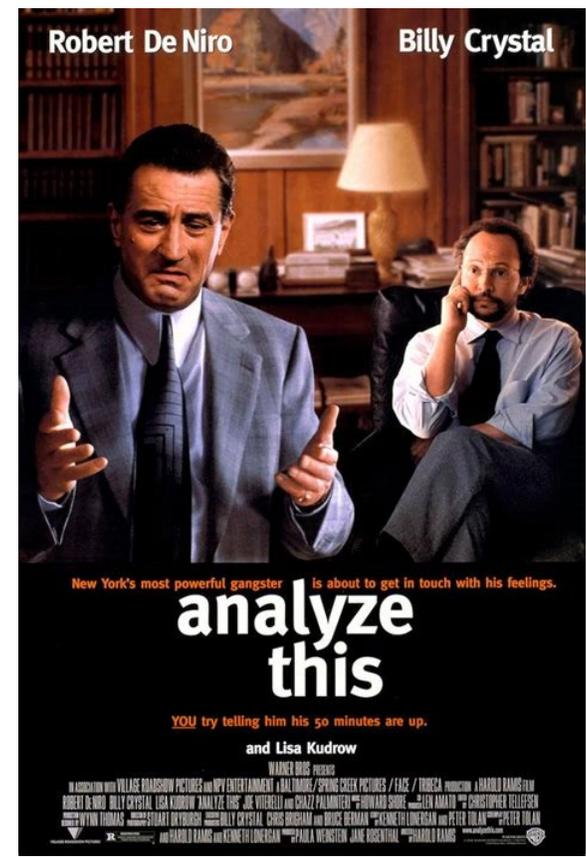
- **Description:** Expenditures for medical supplies and services, which are crucial during disasters for treating injured individuals and preventing disease outbreaks.
- **Typical Entries:** Medical supplies, emergency medical services.

### 7. Emergency Supplies and Equipment

- **Description:** Costs for emergency supplies like meals, water, temporary shelters, and other necessary supplies during a disaster.
- **Typical Entries:** Meals, water supplies, temporary housing units.

### 8. Training and Development

- **Description:** Costs related to training services and educational programs to prepare for or respond to



# Use Case 6: Analyze FEMA Disaster Relief Data

- Final results: 600 rows of data!

Chat GPT added 10 standardized categories

Number	TRACT / ORDER NUMBER	Notification Number	BLIGATED AMOUNT	CONTRACTOR	Description of Requirement	REASON NOT COMPLETED	Category
1	70FA3018C000000C	P00024	\$ 392,213.00	Gordian Group, Inc., The	RS MEANS FOR PA - CONSOLIDATION OF LICENSES	Only One Source - Other (FAR 6.302-1other)	Miscellaneous
2	HSHQDC13DE2018	P00039	\$ 81,993.12	Global Tech Inc.	INFORMATION SYSTEMS SECURITY OFFICER	Competed	IT and Security Services
3	HSFE3016A0201 /	P00002	\$ -	Inmarsat	SATELLITE VOICE SERVICES	Competed	Telecommunication Services
3	70FA3019F0000054	P00002	\$ -	Government, Inc.	HURRICANE DORIAN	Competed	Miscellaneous
3	70FA3019F0000054	P00002	\$ -	Government, Inc.	HURRICANE DORIAN	Competed	Miscellaneous
3	70FA3019F0000054	P00002	\$ -	Government, Inc.	HURRICANE DORIAN	Competed	Miscellaneous
4	70FA3018D000000C	P00006	\$ 68.33	VERIZON WIRELESS	TO ADD INTERNATIONAL FEATURE TO ONE IPHONE DEVICE IN SUPPORT OFDR4404MP	Competed	Telecommunication Services
5	70FA3018D000000C	P00013	\$ 330.49	VERIZON WIRELESS	TO ADD INTERNATIONAL FEATURE TO TWO IPHONES AND ONE MIFI DEVICES IN SUPPORT OF 3425EM	Competed	Telecommunication Services
6	HSFE3016A0201 / 7	P00001	\$ -	Inmarsat Government, Inc.	SATELLITE VOICE SERVICES HURRICANE DORIAN	Competed	Telecommunication Services
7	HSFE3016D0203 / 7	P00001	\$ 8,752.18	VERIZON FEDERAL INC.	TELECOMMUNICATION SERVICES IN SUPPORT OF DR-4461-IL.	Only One Source - Other (FAR 6.302-1other)	Telecommunication Services
7	HSFE3016D0203 / 7	P00001	\$ 8,752.18	VERIZON FEDERAL INC.	LOCAL TELECOMMUNICATION EQUIPMENT AND SERVICES TO SUPPORT FEMA INFRASTRUCTURE NATIO	Only One Source - Other (FAR 6.302-1other)	Telecommunication Services
8	HSFE3016A0201 / 7	P00001	\$ 487.20	Inmarsat Government, Inc.	SATELLITE PHONES	Competed	Telecommunication Services
9	HSFE3016A0201 / 7	P00001	\$ 730.80	Inmarsat Government, Inc.	SATELLITE PHONES	Competed	Telecommunication Services
10	HSFE3016D0203 /	P00001	\$ 1,447.62	VERIZON FEDERAL	TELECOMMUNICATION SERVICES AND	Only One Source -	Telecommunication Services
10	70FA3020F0000000	P00001	\$ 1,447.62	INC.	EQUIPMENT IN SUPPORT OF DR-4339-	Other (FAR 6.302-1	Miscellaneous
10	70FA3020F0000000	P00001	\$ 1,447.62	INC.	FL.	other)	Miscellaneous
11	HSFE3016D0203 /	P00001	\$ 1,699.38	VERIZON FEDERAL	TELECOMMUNICATION SERVICES AND	Only One Source -	Telecommunication Services
11	70FA3020F0000000	P00001	\$ 1,699.38	INC.	EQUIPMENT IN SUPPORT OF DR-4337-	Other (FAR 6.302-1	Miscellaneous

# Use Case 6: Analyze FEMA Disaster Relief Data

- It wasn't perfect: there were a few errors and first iterations kept summarizing the data at a high level, but I wanted the entire table
- Couldn't get it do a simple Tree Map
- Was able to get a Top 20 Stacked graph through iterative dialogue

Good news, analysts: You still have a job 😊



convert the attached tables to excel

**ChatGPT**  
I will now extract the data from the tables in the provided PDF file and convert it into an Excel spreadsheet. This will include all the contract and micropurchase details listed in the report's appendices.

Let's start by extracting this data. Please bear with me for a moment while I process this information.

Error analyzing

Error analyzing

It looks like I encountered a syntax error while trying to create the dataset for conversion. I'll fix this error

and proceed with the conversion of the provided data into an Excel format, making sure to include all details correctly. Let's start this process again.

I have successfully converted the data into an Excel format. You can download the Excel file using the link below:

[Download the Excel file](#)

**You**  
Create a tree map of the dollars for each contractor

**ChatGPT**

Error analyzing

It appears that the module required for creating the tree map is not available in this environment. However, I can use an alternative method to generate the tree map visualization using available tools. Let's proceed with that.

Error analyzing

It seems there was an issue because I hadn't correctly defined the data for the sums by contractor due to the error encountered earlier. Let me properly prepare the data again and then create the tree map.

Error analyzing

It looks like there's an issue with the data type in the 'OBLIGATED AMOUNT' column, possibly containing mixed types or non-numeric entries that weren't properly converted or cleaned. I need to fix these data issues before attempting to generate the tree map again.

Let's clean the data properly and try the visualization once more.

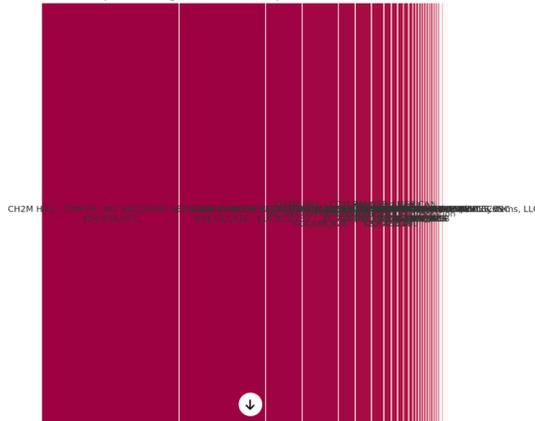
Error analyzing

It seems I missed an import for NumPy, which is needed for generating the color map. I'll import it and attempt to create the tree map again. Let's proceed with the correct setup this time.

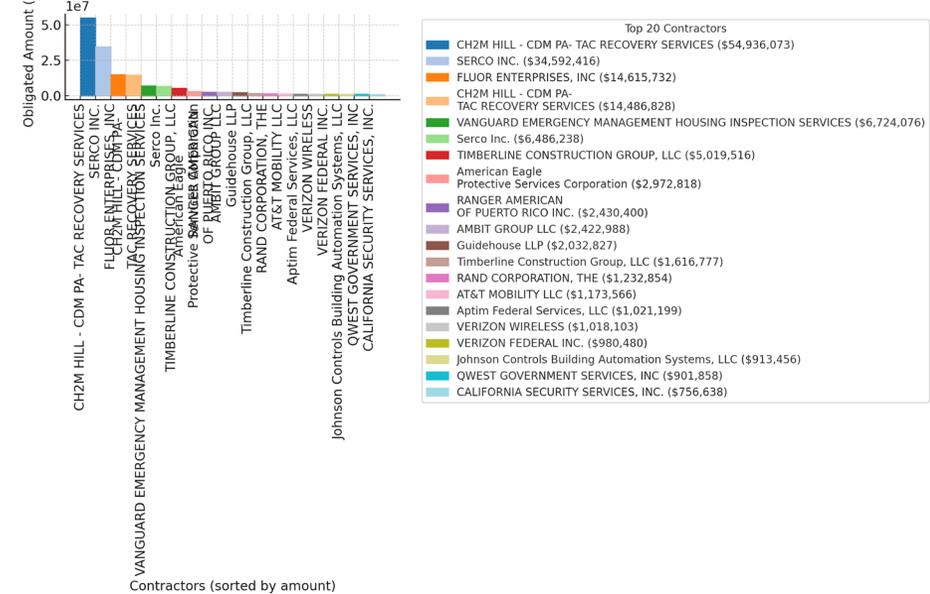
Error analyzing

I encountered another issue because the 'squarify' module is not available in this environment. I'll switch to creating a basic tree map using a method that doesn't rely on the 'squarify' package. Let's proceed with an alternative visualization method.

Treemap of Obligated Dollars per Contractor (Manual)



Stacked Area Map of Obligated Dollars for Top 20 Contractors





- It offered to provide downloadable images, but I got Errors!



It seems there is an internal issue preventing the creation of the Excel workbook with the charts. As an alternative, you can manually insert the generated charts into the Excel workbook. Here are the steps:

1. Download the chart images using the provided links.
2. Open the original Excel workbook (^FEMA Q2 2020 DR Cost Data.xlsx`).
3. Insert the images into the workbook on a new sheet.

Here are the links to download the chart images:

1. [Bar Chart](#)
2. [Pie Chart](#)
3. [Download file](#)
4. [Scatter Chart](#)



# Use Case 7: Writing Macros

- Write a macro to automate sorting

write an excel macro for the attached data set to sort data by "State: Event" column

Number	RACT/ORDER N	ification N	DELEGATED AMOUNT	CONTRACTOR	Date Signed	Completion Date	Ultimate Completion Date	State: Event	Description of Requirement	Category
1	70FA3018C000	P00024	\$ 392,213.00	Gordian Group, Inc., The	10/29/2019	1/9/2020	1/9/2021	4339DR	RSMEANS FOR PA - CONSOLIDATION OF LICENSES	Miscellaneous
2	HSFE3016A020	P00039	\$ 81,993.12	Global Tech Inc.	11/20/2019	5/31/2020	5/31/2020	4339DR	INFORMATION SYSTEMS SECURITY OFFICER	IT and Security Services
3	HSFE3016A020	P00002	\$ -	Inmarsat	11/27/2019	9/26/2019	9/26/2019	7220SU DRF-SURGE-	SATELLITE VOICE SERVICES	Telecommunication Services
3	70FA3019F000	P00002	\$ -	Government Inc.	11/27/2019	9/26/2019	9/26/2019	DISASTR SUPRTRACC TS-	HURRICANE DORIAN	Miscellaneous
3	70FA3019F000	P00002	\$ -	Government Inc.	11/27/2019	9/26/2019	9/26/2019	PRE-	HURRICANE DORIAN	Miscellaneous
3	70FA3019F000	P00002	\$ -	Government Inc.	11/27/2019	9/26/2019	9/26/2019	DECLARE/MOBILZIN	HURRICANE DORIAN	Miscellaneous
4	70FA3018D000	P00006	\$ 68.33	VERIZON WIRELESS	10/8/2019	1/7/2020	1/7/2020	4404DR	TO ADD INTERNATIONAL FEATURE TO ONE IPHONE DEVICE IN SUPPORT OF DR-4404	Telecommunication Services
5	70FA3018D000	P00013	\$ 330.49	VERIZON WIRELESS	12/9/2019	1/7/2020	1/7/2020	3425EM	TO ADD INTERNATIONAL FEATURE TO TWO IPHONES AND ONE MIFI DEVICES IN SU	Telecommunication Services
6	HSFE3016A020	P00001	\$ -	Inmarsat Government, Inc.	11/26/2019	10/2/2019	10/2/2019	3419EM	SATELLITE VOICE SERVICES HURRICANE DORIAN	Telecommunication Services
7	HSFE3016D020	P00001	\$ 8,752.18	VERIZON FEDERAL INC.	10/8/2019	12/8/2019	12/8/2019	4461DR	TELECOMMUNICATION SERVICES IN SUPPORT OF DR-4461-IL	Telecommunication Services
7	HSFE3016D020	P00001	\$ 8,752.18	VERIZON FEDERAL INC.	10/8/2019	12/8/2019	12/8/2019	4461DR	LOCAL TELECOMMUNICATION EQUIPMENT AND SERVICES TO SUPPORT FEMA INFR	Telecommunication Services
8	HSFE3016A020	P00001	\$ 487.20	Inmarsat Government, Inc.	10/21/2019	12/20/2019	12/20/2019	4337DR	SATELLITE PHONES	Telecommunication Services
9	HSFE3016A020	P00001	\$ 730.80	Inmarsat Government, Inc.	12/17/2019	3/20/2020	3/20/2020	4337DR	SATELLITE PHONES	Telecommunication Services
10	HSFE3016D020	P00001	\$ 1,447.62	VERIZON FEDERAL	10/11/2019	12/31/2019	12/31/2019	4399DR	TELECOMMUNICATION SERVICES AND	Telecommunication Services
10	70FA3020F000	P00001	\$ 1,447.62	INC.	10/11/2019	12/31/2019	12/31/2019	4399DR	EQUIPMENT IN SUPPORT OF DR-4339-	Miscellaneous
10	70FA3020F000	P00001	\$ 1,447.62	INC.	10/11/2019	12/31/2019	12/31/2019	4399DR	FL	Miscellaneous
11	HSFE3016D020	P00001	\$ 1,699.38	VERIZON FEDERAL	10/11/2019	12/31/2019	12/31/2019	4337DR	TELECOMMUNICATION SERVICES AND	Telecommunication Services
11	70FA3020F000	P00001	\$ 1,699.38	INC.	10/11/2019	12/31/2019	12/31/2019	4337DR	EQUIPMENT IN SUPPORT OF DR-4337-	Miscellaneous
11	70FA3020F000	P00001	\$ 1,699.38	INC.	10/11/2019	12/31/2019	12/31/2019	4337DR	FL	Miscellaneous
12	HSFE3016D020	P00001	\$ 74,270.00	VERIZON FEDERAL INC.	10/15/2019	12/31/2019	12/31/2019	4466DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4466- TX	Telecommunication Services
13	HSFE3016D020	P00001	\$ 1,765.67	VERIZON FEDERAL INC.	10/15/2019	12/31/2019	12/31/2019	4469DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4469- WI	Telecommunication Services
14	HSFE3016D020	P00001	\$ 3,250.00	VERIZON FEDERAL INC.	10/23/2019	11/22/2019	11/22/2019	4429DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4229- MS	Telecommunication Services
15	HSFE3016D020	P00001	\$ 1,457.00	VERIZON FEDERAL INC.	10/23/2019	11/22/2019	11/22/2019	4463DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4463- SD	Telecommunication Services
16	HSFE3016D020	P00001	\$ 1,394.40	VERIZON FEDERAL INC.	10/25/2019	12/31/2019	12/31/2019	4464DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4464- SC	Telecommunication Services
17	70FA3018D000	P00001	\$ 177,762.35	VERIZON WIRELESS	11/1/2019	7/18/2020	4/26/2021	4654DRF DISASTER TELECO	THE PURPOSE OF THIS ORDER IS TO PROVIDE DEVICES FOR NEW EMPLOYEES ONB	Miscellaneous
18	HSFE3016D020	P00001	\$ 132,050.00	VERIZON FEDERAL INC.	10/31/2019	12/31/2019	12/31/2019	4277DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-1603- LA	Telecommunication Services
19	HSFE3016D020	P00001	\$ 22,801.00	VERIZON FEDERAL INC.	10/31/2019	12/31/2019	12/31/2019	4277DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4277- LA	Telecommunication Services
20	HSFE3016D020	P00001	\$ 24,946.00	VERIZON FEDERAL INC.	10/31/2019	12/31/2019	12/31/2019	4424DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4424- OH	Telecommunication Services
21	HSFE3016D020	P00001	\$ 980.00	VERIZON FEDERAL INC.	10/31/2019	12/31/2019	12/31/2019	4469DR	TELECOMMUNICATION SERVICES AND EQUIPMENT IN SUPPORT OF DR-4469- WI	Telecommunication Services

Here's an Excel macro to sort the data by the "State: Event" column. This macro will open the specified sheet and sort the data accordingly.

- Press `ALT + F11` to open the VBA editor.
- Insert a new module by right-clicking on any existing module or the `VBAProject`, selecting `Insert`, and then `Module`.
- Copy and paste the following VBA code into the module.

```

vba
Copy code

Sub SortByStateEvent()
    Dim ws As Worksheet
    Dim lastRow As Long

    ' Set the worksheet you want to sort
    Set ws = ThisWorkbook.Sheets("Sheet1")

    ' Find the last row with data in the sheet
    lastRow = ws.Cells(ws.Rows.Count, "A").End(xlUp).Row

    ' Sort the data by the "State: Event" column (assuming it is column J)
    ws.Range("A1:K" & lastRow).Sort Key1:=ws.Range("J1"), Order1:=xlAscending, Header:=xlYes

    ' Notify the user
    MsgBox "Data sorted by 'State: Event' column successfully."

End Sub
    
```

# Use Case 8: Testing

## • 8a Write a test plan for a mobile app

Write a test plan for a mobile app



Creating a comprehensive test plan for a mobile app involves several key components to ensure that the app functions correctly across various devices and scenarios. Here's a detailed test plan:

### Test Plan for Mobile App

#### 1. Introduction

##### Objective:

To verify the functionality, usability, performance, and security of the mobile app across different devices and operating systems.

##### Scope:

This test plan covers the testing of the mobile app on both Android and iOS platforms.

##### Resources Required:

- Test devices (smartphones and tablets)
- Testing tools (e.g., Appium, Xcode, Android Studio, Charles Proxy)
- Test data
- QA team

#### 2. Test Items

The following features/modules of the mobile app will be tested:

- User Authentication (Login/Logout)
- User Registration
- Dashboard
- Profile Management
- Notifications
- Settings
- In-app Purchases
- Social Media Integration
- Offline Functionality

#### 3. Testing Approach

##### Types of Testing:

1. Functional Testing:



#### 4. Test Environment

##### Hardware:

- Various Android and iOS devices with different screen sizes and OS versions.

##### Software:

- Android Studio for Android app testing.
- Xcode for iOS app testing.
- Appium for automated testing.
- Charles Proxy for network testing.

#### 5. Test Cases

##### Example Test Cases:

##### 1. User Authentication:

- Verify login with valid credentials.
- Verify login with invalid credentials.
- Verify the logout functionality.

##### 2. User Registration:

- Verify registration with valid data.
- Verify registration with invalid data.
- Verify email verification process.

##### 3. Dashboard:

- Verify the dashboard loads correctly.
- Verify data is displayed as expected.
- Verify navigation from the dashboard to other screens.

##### 4. Profile Management:

- Verify updating user profile information.
- Verify profile picture upload functionality.

##### 5. Notifications:

- Verify push notifications are received.
- Verify in-app notifications.

#### 6. Defect Management



# Use Case 8: Testing

• **8b Write a Test Case, “Login to Application with 2-Factor Authentication”, iterate by having it “add more”**

Here's an example of a test case to log in to an application with 2-factor authentication (2FA):

**Test Case: Login to Application with 2-Factor Authentication**

Test Case ID: TC-Login-001

Title: Verify login functionality with 2-factor authentication

Description: This test case verifies that a user can successfully log in to the application using 2-factor authentication.

**Preconditions:**

1. User is registered in the application.
2. User has 2-factor authentication enabled.
3. User has access to the secondary authentication device (e.g., mobile phone for SMS/OTP, authenticator app).

**Test Data:**

- Username: `testuser`
- Password: `Password123`
- 2FA method: SMS/OTP or Authenticator app

**Steps:**

1. Open the web browser.
2. Navigate to the application login page (e.g., `https://www.example.com/login`).
3. Enter the username `testuser` in the username field.
4. Enter the password `Password123` in the password field.
5. Click the "Login" button.
6. Wait for the 2-factor authentication prompt.
7. Retrieve the 2FA code from the secondary authentication method (SMS/OTP or authenticator app).
8. Enter the 2FA code in the provided field.
9. Click the "Verify" or "Submit" button.
10. Verify that the user is redirected to the application dashboard or home page.

**Expected Result:**

- The user should be successfully logged in and redirected to the application dashboard or home page.

**Postconditions:**

- User is logged into the application and can access its features.

**Test Case Execution:**

Step	Description	Expected Result	Pass/Fail	Remarks
1	Open the web browser.	Browser is opened.		
2	Navigate to the application login page.	Application login page is displayed.		
3	Enter the username `testuser` in the username field.	Username is entered.		
4	Enter the password `Password123` in the password field.	Password is entered.		
5	Click the "Login" button.	2FA prompt is displayed.		
6	Wait for the 2-factor authentication prompt.	2FA prompt is received.		
7	Retrieve the 2FA code from the secondary authentication method.	2FA code is retrieved.		
8	Enter the 2FA code in the provided field.	2FA code is entered.		
9	Click the "Verify" or "Submit" button.	User is redirected to the application dashboard or home page.		
10	Verify that the user is redirected to the application dashboard or home page.	User is successfully logged in and can access the application features.		

**Notes:**

- If any step fails, capture screenshots and provide detailed error messages for troubleshooting.
- Ensure that the 2FA code is valid and not expired before entering it.

add more preconditions

Certainly! Here are additional preconditions for the test case to ensure a more comprehensive setup:

**Test Case: Login to Application with 2-Factor Authentication**

Test Case ID: TC-Login-001

Title: Verify login functionality with 2-factor authentication

Description: This test case verifies that a user can successfully log in to the application using 2-factor authentication.

**Preconditions:**

1. User is registered in the application.
2. User has 2-factor authentication enabled.
3. User has access to the secondary authentication device (e.g., mobile phone for SMS/OTP, authenticator app).
4. The application server is up and running.
5. The user has an active internet connection.
6. The user's secondary authentication device (e.g., mobile phone) has an active internet connection or network coverage.
7. The browser cache and cookies are cleared to prevent issues related to previous sessions.
8. The user is logged out of any other sessions of the application.
9. The 2FA code is set to a valid time frame for the test (e.g., code expires in 30 seconds).

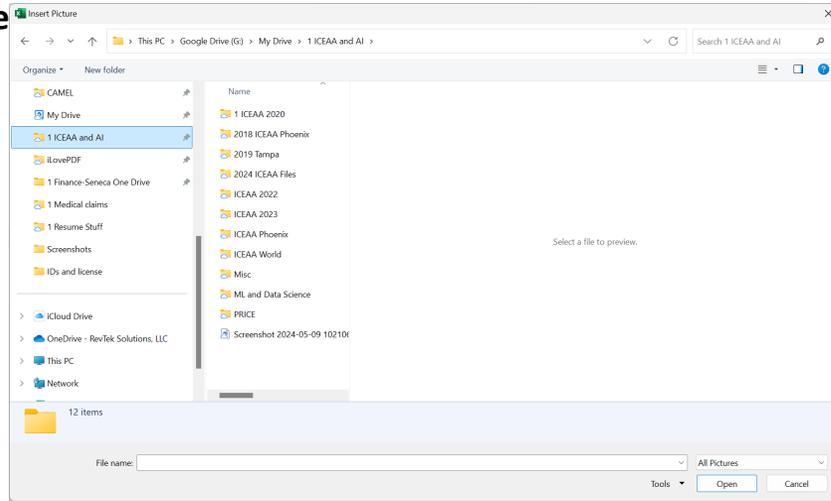
**Test Data:**

- Username: `testuser`
- Password: `Password123`
- 2FA method: SMS/OTP or Authenticator app

# Use Case 9: Built-in AI in Excel



- Microsoft is including more AI features embedded within Excel
- Insert data from a picture, screenshot, etc
- In Excel, choose Data > From Picture



Appendix 1. List of all disaster-related contracts and micropurchase actions issued during FY 2020 Q1

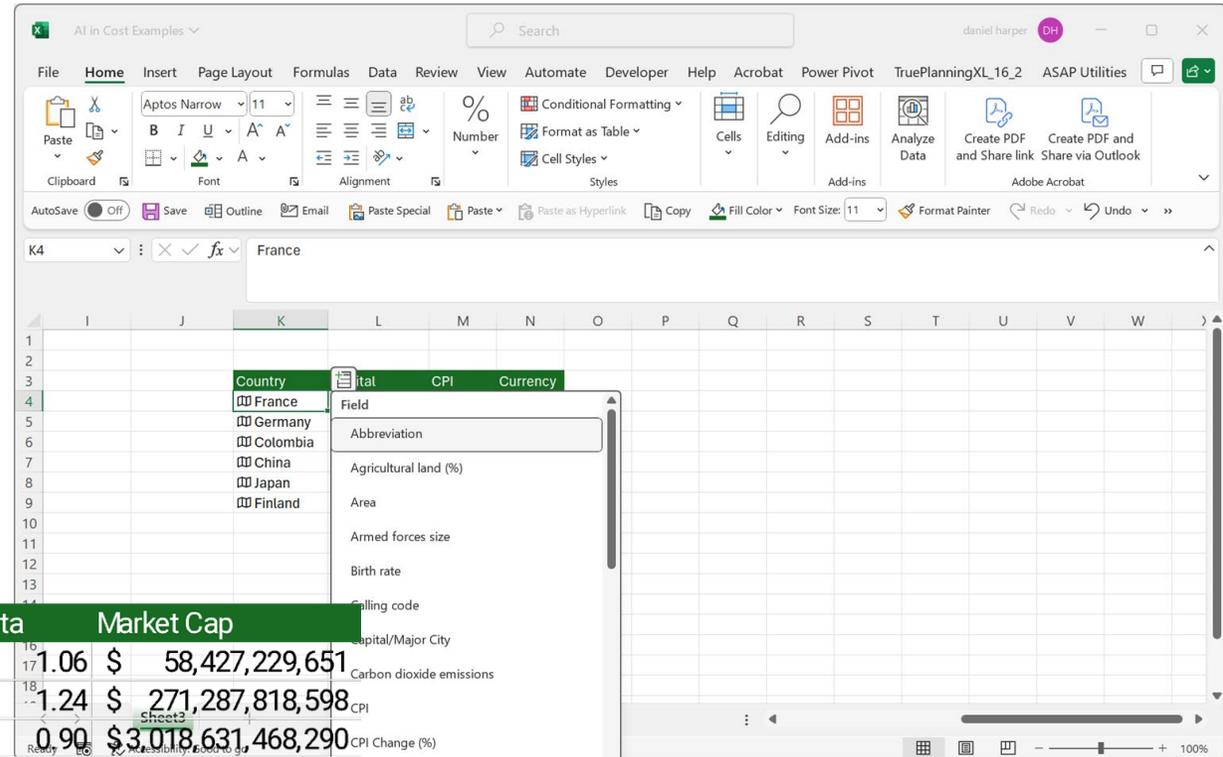
CONTRACT/ORDER NUMBER	Modification Number	OBLIGATED AMOUNT	CONTRACTOR	Date Signed	Completion Date	Ultimate Completion Date	State: Event	Description of Requirement	REASON NOT COMPLETED
70FA3018C00000003	P00024	\$392,213.00	Gordian Group, Inc., The	10/29/2019	1/9/2020	1/9/2021	4339DR	RS MEANS FOR PA - CONSOLIDATION OF LICENSES	Only One Source - Other (FAR 6.302-1 other)
HSHQDC13DE2018 / 70FA3019F00000356	P00039	\$81,993.12	Global Tech Inc.	11/20/2019	5/31/2020	5/31/2020	4339DR	INFORMATION SYSTEMS SECURITY OFFICER	Competed
HSFE3016A0201 / 70FA3019F00000549	P00002	\$0.00	Inmarsat Government, Inc.	11/27/2019	9/26/2019	9/26/2019	7220SU DRF-SURGE-DISASTR SUPRT ACCTS- PRE-DECLARE/MOBILZTN	SATELLITE VOICE SERVICES HURRICANE DORIAN	Competed
70FA3018D00000003 / 70FA3019F00000633	P00006	\$68.33	VERIZON WIRELESS	10/8/2019	1/7/2020	1/7/2020	4404DR	TO ADD INTERNATIONAL FEATURE TO ONE IPHONE DEVICE IN SUPPORT OF DR4404MP	Competed
70FA3018D00000003 / 70FA3019F00000633	P00013	\$330.49	VERIZON WIRELESS	12/9/2019	1/7/2020	1/7/2020	3425EM	TO ADD INTERNATIONAL FEATURE TO TWO IPHONES AND ONE MIFI DEVICES IN SUPPORT OF 3425EM TYPHOON BUALOI	Competed
HSFE3016A0201 / 70FA3019F00000670	POOOOI	\$0.00	Inmarsat Government, Inc.	11/26/2019	10/2/2019	10/2/2019	3419EM	SATELLITE VOICE SERVICES HURRICANE DORIAN	Competed
HSFE3016D0203 / 70FA3020F00000002		\$8,752.18	VERIZON FEDERAL INC.	10/8/2019	12/8/2019	12/8/2019	4461DR	TELECOMMUNICATION SERVICES IN SUPPORT OF DR-4461-IL LOCAL TELECOMMUNICATION EQUIPMENT AND SERVICES TO SUPPORT FEMA INFRASTRUCTURE NATIONWIDE (CONUS AND OCONUS), WHICH WILL ENABLE THE AGENCY CHARGED WITH THE CENTRALIZED DIRECTION OF EMERGENCY MANAGEMENT TO FULFILL ITS MISSION.	Only One Source - Other (FAR 6.302-1 other)
HSFE3016A0201 / 70FA3020F00000003		\$487.20	Inmarsat Government, Inc.	10/21/2019	12/20/2019	12/20/2019	4337DR	SATELLITE PHONES	Competed

Number	CONTRACT/ORDER NUMBER	Modification Number	OBLIGATED AMOUNT	CONTRACTOR	Date Signed	Completion Date	Ultimate Completion Date	State: Event	Description of Requirement	REASON NOT COMPLETED
1	70FA3018C00000003	P00024	\$392,213.00	Gordian Group, Inc., The	10/29/2019	1/9/2020	1/9/2021	4339DR	RS MEANS FOR PA - CONSOLIDATION OF LICENSES	Only One Source - Other (FAR 6.302-1 other)
2	HSHQDC13DE2018 / 70FA3019F00000356	P00039	\$81,993.12	Global Tech Inc.	11/20/2019	5/31/2020	5/31/2020	4339DR	INFORMATION SYSTEMS SECURITY OFFICER	Competed
3	HSFE3016A0201 / 70FA3019F00000549	P00002	\$0.00	Inmarsat Government, Inc	11/27/2019	9/26/2019	9/26/2019	7220SU DRF-SURGE-DISASTR SUPRT ACCTS PRE-DECLARE/MOBILZTN	SATELLITE VOICE SERVICES HURRICANE DORIAN	Competed
4	70FA3018D00000003 / 70FA3019F00000633	P00006	\$68.33	VERIZON WIRELESS	10/8/2019	1/7/2020	1/7/2020	4404DR	TO ADD INTERNATIONAL FEATURE TO ONE IPHONE DEVICE IN SUPPORT OF DR4404MP	Competed
5	70FA3018D00000003 / 70FA3019F00000633	P00013	\$330.49	VERIZON WIRELESS	12/9/2019	1/7/2020	1/7/2020	3425EM	TO ADD INTERNATIONAL FEATURE TO TWO IPHONES AND ONE MIFI DEVICES IN SUPPORT OF 3425EM TYPHOON BUALOI	Competed
6	HSFE3016A0201 / 70FA3019F00000670	POOOOI	\$0.00	Inmarsat Government, Inc.	11/26/2019	10/2/2019	10/2/2019	3419EM	SATELLITE VOICE SERVICES HURRICANE DORIAN	Competed
7	HSFE3016D0203 / 70FA3020F00000002		\$8,752.18	VERIZON FEDERAL INC.	10/8/2019	12/8/2019	12/8/2019	4461DR	TELECOMMUNICATION SERVICES IN SUPPORT OF DR-4461-IL LOCAL TELECOMMUNICATION EQUIPMENT AND SERVICES TO SUPPORT FEMA INFRASTRUCTURE NATIONWIDE (CONUS AND OCONUS), WHICH WILL ENABLE THE AGENCY CHARGED WITH THE CENTRALIZED DIRECTION OF EMERGENCY MANAGEMENT TO FULFILL ITS MISSION.	Only One Source - Other (FAR 6.302-1 other)
8	HSFE3016A0201 / 70FA3020F00000003		\$487.20	Inmarsat Government, Inc	10/21/2019	12/20/2019	12/20/2019	4337DR	SATELLITE PHONES	Competed



- **Insert Geographic Data or Stocks**

- **Insert > Data > From Picture**



Company	HIGH	Low	Beta	Market Cap
CROWDSTRIKE HOLDINGS, INC. (XNAS:CRWD)	\$ 140.52	\$ 140.52	1.06	\$ 58,427,229,651
NETFLIX, INC. (XNAS:NFLX)	\$ 344.73	\$ 344.73	1.24	\$ 271,287,818,598
MICROSOFT CORPORATION (XNAS:MSFT)	\$ 309.45	\$ 309.45	0.90	\$ 3,018,631,468,290
ALPHABET INC. (XNAS:GOOG)	\$ 121.46	\$ 121.46	1.05	\$ 2,024,384,000,000
NVIDIA CORPORATION (XNAS:NVDA)	\$ 39.23	\$ 39.23	1.70	\$ 2,696,529,000,000

Credit: YouTuber [Kenji Explains](#)

Learn how to use the AI features available in Excel. Get the FREE AI for Data Analysis Guide from Hubspot: <https://clickhubspot.com/8gdl>



# Use Case 9: Built-in AI in Excel: Analyze Data Feature

- Analyze Data Feature

The screenshot displays the Microsoft Excel interface with the 'Analyze Data' task pane open on the right. The spreadsheet data is as follows:

Continent	Name	Country	Price	Units	Revenue
Africa	Janet	FR	400	91	36400
North America	Janice	IT	400	84	33440
Africa	Charlotte	FR	320	84	26752
Asia	Natalie	FR	320	84	26752
North America	Doris	IT	400	84	33440
Asia	Keith	UK	250	84	20900
Africa	Kelly	JP	320	82	26240
Asia	Kennedi	ES	250	80	20000
South America	Joseph	FR	150	80	12000
Asia	Steven	US	150	80	12000
Europe	Kenneth	JP	150	80	12000
Africa	Nicholas	ES	320	80	25600
Asia	Judith	JP	400	80	32000
Europe	Hannah	ES	320	80	25536
Asia	Marilyn	IT	400	80	31840
Africa	Brendan	JP	400	76	30400
Asia	Carolyn	FR	150	76	11400
Europe	Teresa	IT	400	76	30400
Asia	Beverly	FR	150	76	11400
Africa	Brittany	IT	320	76	24320
Asia	Christian	JP	320	76	24320
Europe	Gary	ES	320	76	24320
Africa	Ivan	US	320	75	24000
Asia	Jonah	US	400	75	30000
Europe	Lucia	JP	150	75	11250

The 'Analyze Data' pane on the right provides the following insights:

- Suggested questions:**
  - Percentage of total 'Revenue' for each 'Name'
  - Sort 'Country' by total 'Units' in ascending order
- Discover insights:**
  - 'Revenue' by 'Country' and 'Name': A pivot table showing revenue for countries ES, FR, and others, with a total of 95456 for ES and 124704 for FR.
  - 'Units': A scatter plot showing Units vs Price.
  - 'Continent': Asia and Africa have noticeably higher 'Revenue'. A horizontal bar chart showing Sum of Revenue (Thousands) for continents: Asia (~200), Africa (~180), Europe (~100), North America (~50), South America (~20).



- Iteratively created market **research spreadsheet**

Create a comparison sheet of different tools used for group collaboration. For example, Discord, Reddit, and Facebook groups. Include up to 20 different tools.

Include the following criteria: Ability to charge a fee for membership; chat capability between members; file storage capability; ability to create message threads; ability to host virtual meetings; subscription price, or cost for using tool;

Add color to the worksheet: green for cells that say yes; red for cells that say no

For criteria where a ranking is more appropriate than a simple yes or no indication, add a ranking of one to five, where 1 indicates the lowest ranking for that criteria and a five indicates the highest ranking for that criteria.



Tool	Chat Capability Between Members (1-5)					Ability to Create Message Threads (1-5)	Ability to Host Virtual Meetings (1-5)	Subscription Price or Cost for Using Tool Website	Cost	Gamification?	Comments
	File Storage Capability (1-5)	Ability to Charge a Fee for Membership	Ability to Create Message Threads (1-5)	Ability to Host Virtual Meetings (1-5)	Subscription Price or Cost for Using Tool Website						
Discord	5	4	5	4	Free/Paid	<a href="https://discord.com">https://discord.com</a>	\$0 - \$9.99 per user/month	\$0	Yes-users can earn "karma" for participation	There is a Reddit business version	
Reddit	3	1	4	1	Free	<a href="https://reddit.com">https://reddit.com</a>	\$0				
Facebook Groups	4	3	4	1	Free	<a href="https://www.facebook.com/groups">https://www.facebook.com/groups</a>	\$0				
Slack	5	5	5	4	Free/Paid	<a href="https://slack.com">https://slack.com</a>	\$0 - \$12.50 per user/month				
Microsoft Teams	5	5	5	5	Free/Paid	<a href="https://www.microsoft.com/teams">https://www.microsoft.com/teams</a>	\$0 - \$12.50 per user/month				
Zoom	3	1	1	5	Free/Paid	<a href="https://zoom.us">https://zoom.us</a>	\$0 - \$19.99 per user/month				
Google Meet	3	1	1	5	Free	<a href="https://meet.google.com">https://meet.google.com</a>	\$0				
Trello	1	3	1	1	Free/Paid	<a href="https://trello.com">https://trello.com</a>	\$0 - \$17.50 per user/month				
Asana	2	4	1	1	Free/Paid	<a href="https://asana.com">https://asana.com</a>	\$0 - \$24.99 per user/month				
Notion	2	4	1	1	Free/Paid	<a href="https://www.notion.so">https://www.notion.so</a>	\$0 - \$15.99 per user/month				
Basecamp	4	4	2	1	Paid	<a href="https://basecamp.com">https://basecamp.com</a>	\$99 per month				
ClickUp	4	4	3	2	Free/Paid	<a href="https://clickup.com">https://clickup.com</a>	\$0 - \$19 per user/month				
Monday.com	2	4	3	5	Paid	<a href="https://monday.com">https://monday.com</a>	\$8 - \$10 per user/month				
Confluence	2	4	2	1	Paid	<a href="https://www.atlassian.com/confluence">https://www.atlassian.com/confluence</a>	\$10 per user/month				
Miro	2	4	2	3	Free/Paid	<a href="https://miro.com">https://miro.com</a>	\$0 - \$16 per user/month				
Workplace by Facebook	4	3	4	4	Paid	<a href="https://www.workplace.com">https://www.workplace.com</a>	\$4 per user/month				
Yammer	4	3	4	4	Paid	<a href="https://www.yammer.com">https://www.yammer.com</a>	\$3 - \$8 per user/month				
Flock	4	4	4	4	Free/Paid	<a href="https://flock.com">https://flock.com</a>	\$0 - \$4.50 per user/month				
Webex	4	4	4	4	Free/Paid	<a href="https://www.webex.com">https://www.webex.com</a>	\$0 - \$20 per user/month				
BlueJeans	4	4	4	4	Paid	<a href="https://www.bluejeans.com">https://www.bluejeans.com</a>	\$9.99 - \$15.99 per user/month				
Chanty	4	3	4	3	Free/Paid	<a href="https://www.chanty.com">https://www.chanty.com</a>	\$0 - \$4 per user/month				
Glip	4	4	4	4	Free/Paid	<a href="https://glip.com">https://glip.com</a>	\$0 - \$9.99 per user/month				
Rocket.Chat	4	3	4	3	Free	<a href="https://rocket.chat">https://rocket.chat</a>	\$0				
Mattermost	4	3	4	3	Free	<a href="https://mattermost.com">https://mattermost.com</a>	\$0				
Zoho Cliq	4	3	4	3	Free/Paid	<a href="https://www.zoho.com/cliq">https://www.zoho.com/cliq</a>	\$0 - \$3.50 per user/month				
Pumble	4	3	4	3	Free	<a href="https://pumble.com">https://pumble.com</a>	\$0				
Ryver	4	3	4	3	Free/Paid	<a href="https://ryver.com">https://ryver.com</a>	\$0 - \$99 per month				
Twist	4	3	4	2	Free/Paid	<a href="https://twist.com">https://twist.com</a>	\$5 per user/month				
Flowdock	4	3	4	3	Free/Paid	<a href="https://www.flowdock.com">https://www.flowdock.com</a>	\$3 per user/month				
Podio	3	4	3	4	Free/Paid	<a href="https://podio.com">https://podio.com</a>	\$0 - \$24 per user/month				

You can download the updated comparison sheet with colored cells from the following link:

[Group Collaboration Tools Comparison \(Colored\).xlsx \[-\]](#)

# Considerations and Caveats

- Generative AI models such as ChatGPT can produce convincingly erroneous results – must be validated
  - Even data sources quoted by AI can be fictitious!
- Successful AI implementations rely on well-crafted inputs and test data
- Some of the techniques and methods employed by AI models are “black box”, complicating traceability and auditing

# Questions, Comments, Contracts?

Kevin McKeel 703.919.6359  
mckeel@logapps.com

Daniel Harper 703.629.1840  
dharper@westerdoorfederal.com



# Resources

- Chief Digital and AI Office (CDAO). CDAO Tradewinds AI [Acquisition Literacy Newsletter](#) [weekly] Top news and reports on artificial intelligence for everyone on the acquisition team.



# Resources

**AI Acquisition Playground**. This page is a collection of AI experiments in support of the DoD Acquisition mission. Responsible AI is encouraged, these are only experimental tools, made public to promote use and gather feedback. These experimental tools should only augment human involvement.

This page is a collection of AI experiments in support of the DoD Acquisition mission. Responsible AI is encouraged, these are only experimental tools, made public to promote use and gather feedback. These experimental tools should only augment human involvement.



### EULA Shredder

Paste in proposed EULA, identify any non-acceptable language for DoD (Powered by Acqbot) Not yet available CUI

9

0



### ACQBOT

CDAO contract writing system - rapidly write user requirements, industry outreach, solicitations and agreements Requires Tradewinds .gov/.mil Login Not yet available CUI

9

0



### Market Research

Market Research post-competition AI solutions from the Tradewinds Solution Marketplace. Requires Tradewinds .gov/.mil Login Not yet available CUI

7

0



### PDF Query

Upload a PDF & ask questions related to the contents of the document (Powered by Acqbot) Not yet available CUI

6

0



### NIPRGPT

LLM Created by ARFL, up to CUI (DoD registration) Available for CUI

6

2



### Turbo Innovate

Market Research Report Generator Available to USAF employees only

5

3

# Backup

# Questions Captureed

Meeting chat

bc d

Paul Wilkinson (Unverified) 11:23 AM

PW How do you foresee the future of AI especially in the context of sensitive data like you mentioned with cloud access?

👍 1

Sarah Green (Unverified) 11:27 AM

SG Certainly there are tons of applications for Chat GPT, LLMs, and Gen AI models. The biggest barrier we have currently in this area (understandably) would be security restrictions. In particular there was a memo that came out that I believe restricts usage for publicly available LLMs like Chat GPT to only data that's been cleared for public release. Can you talk to that a bit in the context of these use cases and what you're seeing as support contractors as far as available tools? So much of the data we work with is CUI at minimum, more often PROPIN

👍 2

<https://nijrgpt.mil/>

I know within VAULT and ADVANA they are looking to approve and deploy LLMs but so far it's very limited

👍 1

NIPR GPT is a good start for gov't for folks not aware, but not fully funded and very limited as far as the amount of data you can upload

# References

1. <https://www.statista.com/statistics/871513/worldwide-data-created/>
2. <https://www.geeksforgeeks.org/introduction-convolution-neural-network/>
3. [What is the difference between a convolutional neural network and a regular neural network? - Artificial Intelligence Stack Exchange](#)

# Use Case 7: Analysis of Financial Data

You

transactions (58).csv  
Spreadsheet

please analyze my data

ChatGPT

The dataset seems to represent transaction records, possibly from a personal or business account. Here's a breakdown of the columns present in the data:

- Date:** The date of the transaction.
- Merchant:** The entity with which the transaction was made.
- Category:** The category of the transaction, for example, income, gas & fuel, unknown, etc.
- Account:** The account from which the transaction was made. It seems to mask sensitive parts of the account number.
- Original Statement:** The original statement description of the transaction.
- Notes:** Additional notes about the transaction, if any.
- Amount:** The amount of the transaction. Negative values probably indicate expenses, while positive values indicate income.
- Tags:** Additional tags or labels for the transaction, if any.

What specific analysis or insights are you looking for with this data? Some common analyses could include:

- Summary Statistics:** Overview of total income vs. expenses, average transaction amount, etc.
- Categorization Analysis:** Analysis of spending or income by category.
- Temporal Analysis:** How do income and expenses trend over time? Are there any noticeable patterns?
- Merchant Analysis:** Which merchants are most common, or which ones involve the highest amounts of spending or income?

- Vacation food:** 16 transactions, total of -\$534.03
- Veterinary:** 1 transaction, total of -\$109.50
- Water:** 2 transactions, total of -\$181.50
- kids activities:** 1 transaction, total of \$53.47
- medical bill:** 10 transactions, total of -\$3511.58

### Temporal Analysis:

(Note: Displaying the aggregated amount of transactions monthly, with count, sum, average, minimum, and maximum.)

- Transactions are spread from November 2021 to January 2024.
- There's a significant fluctuation in the total amounts, with some months showing large positive sums and others showing large negative sums.
- Latest Month (January 2024):** 328 transactions, total sum of \$88,505.52, average of \$269.83 per transaction.

### Merchant Analysis:

(Note: Only a part of the merchants is displayed for brevity. Each merchant provides a count of transactions, total sum, average transaction amount, minimum, and maximum transaction amount with that merchant.)

- 3 Dogs and a Chick:** 1 transaction, total of -\$29.96
- 3rd Planet:** 1 transaction, total of -\$6.35
- 3rd Planet Brewing:** 20 transactions, total of -\$483.73
- 527 HOLDINGS MIARMAR BEACH:** 1 transaction, total of -\$10.92
- 7-Eleven:** 5 transactions, total of -\$14.04

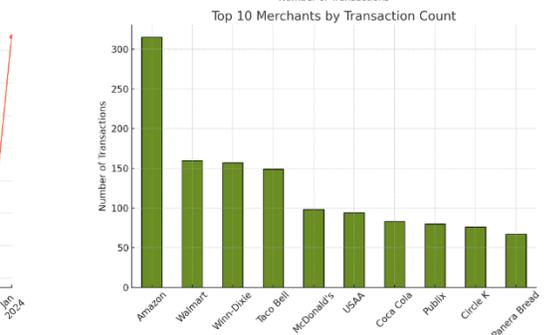
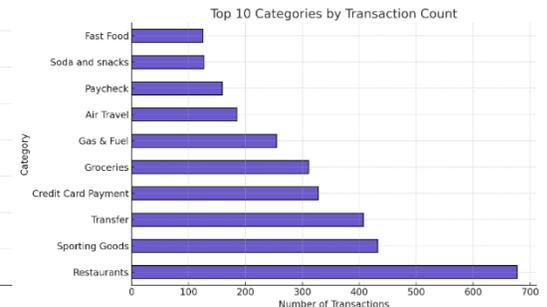
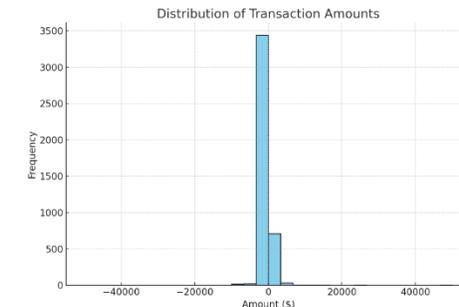


You

create some charts showing this analysis



ChatGPT



The charts visualize various aspects of your transaction data:

# Use Case 8: Analysis of GSA Calc Labor Rates

- Asdflijasd;fl
  - ChatGPT is a prototype AI chatbot afa

**GSA** BUY.GSA.GOV | Pricing

Research ▾ Develop documents ▾ Buy ▾ Help ▾

Home / Pricing Intelligence Suite / Labor Category Ceiling Rates

### Search labor category ceiling rates applicable to GSA's Multiple Award Schedules

This tool allows you to review fully burdened Not-to-Exceed Ceiling Rates awarded under GSA Multiple Award Schedule (MAS) contracts. You can use it to do market research and develop Independent Government Cost Estimates.

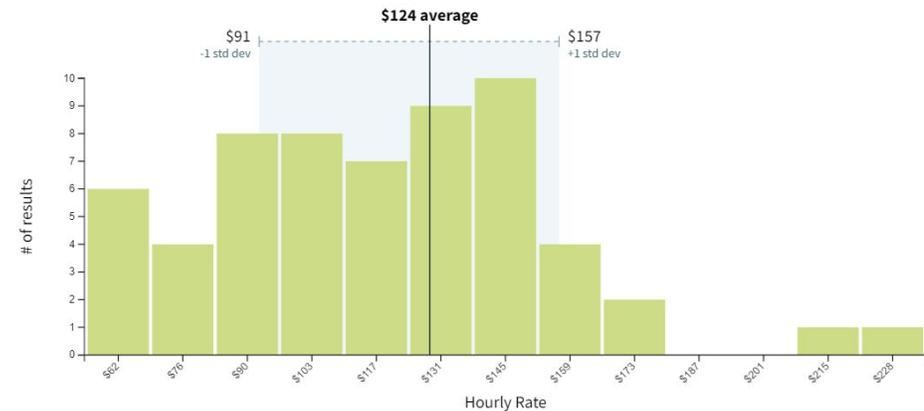
The tool can be used to assess the relative competitiveness of a vendor's price to other vendors' prices on MAS contracts. However, the tool is to be used only as part of a larger negotiation objective development strategy that seeks fair and reasonable pricing (in accordance with FAR 15.4).

[Labor Ceiling Rates User Guide](#) PDF

Search by:

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Not-To-Exceed Hourly Ceiling Rate



Standard deviation is a commonly used measurement that, in this case, tells you how far each labor category price is from the average (or arithmetic mean). It should not be used as the basis for determining fair and reasonable pricing. The Labor Ceiling Rate histogram displays the average labor rate, the price point that includes 34% of prices higher than the mean (in a normal distribution), the price point that includes 34% of prices lower than average (in a normal distribution), and the number of results per price range.

Std Deviation -1	Average Price	Std Deviation +1
<b>\$91.00</b>	<b>\$124.00</b>	<b>\$157.00</b>

# Use Case 8: Testing (Google Gemini)

- **8b Write a Test Case using Gemini, “Login to Application with 2-Factor Authentication”**

- **Similar results, but Chat GPT provided more test cases**



Absolutely! Here's a test case outline for a 2FA login scenario, along with considerations for different implementations:

#### Test Case: Successful Login with Two-Factor Authentication

##### Objective:

Verify that a user can successfully log in to the application using valid credentials and a correct two-factor authentication code.

##### Preconditions:

1. The application is running and accessible.
2. The user has a registered account with valid credentials.
3. The user's two-factor authentication method is configured and active (e.g., SMS, authenticator app, email).

##### Test Steps:

1. **Navigate to Login Page:** Open the application and go to the login page.
2. **Enter Credentials:** Enter the user's valid username/email and password in the respective fields.
3. **Click Login:** Submit the login form by clicking the "Login" button.
4. **Receive 2FA Code:** The application should prompt for a two-factor authentication code. Retrieve the code from the user's chosen method (SMS, authenticator app, email).
5. **Enter 2FA Code:** Enter the received code into the provided input field.
6. **Click Verify/Submit:** Click the button to verify the 2FA code.

##### Expected Results:

1. Upon successful verification of the 2FA code, the user should be redirected to the application's home page or dashboard.
2. A welcome message or the user's profile information should be displayed, indicating a successful login.

##### Additional Test Cases (Variations):

- **Invalid 2FA Code:** Test entering an incorrect 2FA code and verify that an appropriate error message is displayed.
- **Expired 2FA Code:** Test entering a valid code that has exceeded its time limit and ensure a clear message is shown.
- **Multiple Incorrect Attempts:** Verify that the application locks the account or

3. **Click Login:** Submit the login form by clicking the "Login" button.
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##### Additional Test Cases (Variations):

- **Invalid 2FA Code:** Test entering an incorrect 2FA code and verify that an appropriate error message is displayed.
- **Expired 2FA Code:** Test entering a valid code that has exceeded its time limit and ensure a clear message is shown.
- **Multiple Incorrect Attempts:** Verify that the application locks the account or displays a warning after a certain number of incorrect 2FA code attempts.
- **Resend 2FA Code:** Check the functionality for resending a 2FA code if the initial one is not received.
- **Alternative 2FA Methods:** If multiple methods are supported, test each one (e.g., SMS, authenticator app, email).

##### Implementation Considerations:

- **Automation:** This test case is ideal for automation using tools like Selenium, Appium, or Cypress.
- **2FA Handling in Automation:**
  - **Authenticator Apps:** You'll likely need a library to interact with the authenticator app and extract the code.
  - **SMS/Email:** Consider using a service (like Twilio) or a local test environment to intercept and retrieve codes.
- **Security:** Never store real user credentials or 2FA codes in plain text in your test scripts. Use environment variables or secure configuration mechanisms.

Let me know if you'd like help adapting this for a specific testing framework or application!

# Using ChatGPT in a Spreadsheet

## How to use ChatGPT Functions in a spreadsheet: Initial Setup

Show users how to get set up with ChatGPT, locating their unique API token, and installing on their system for utilizing ChatGPT

<https://chat.openai.com/chat>

<https://www.youtube.com/watch?v=zHlzvQR6w>



### Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



### Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



### Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

# AI 101: Major Developments

Modern AI Developments	AI Paradigm	Foundational AI				Insightful AI			Generative AI	
	Decade	1940's	1950's	1960's	1970's	1980's	1990's	2000's	2010's	2020's
Robotics		Early work				Practical applications				
Neural Networks		Early work				Revival				
Natural Language Processing (NLP)			Early work			Practical applications				
Computer Vision				Early work					Breakthrough	
Expert Systems						Early work				
Machine Learning (ML)						Early work				
Reinforcement Learning (RL)						Early work				
Big Data							Introduced		Mass adoption	
Deep Learning								Introduced		Breakthrough
Generative Models (GANs, etc.)									Introduced	

# AI 101: Machine Learning

Definition: algorithms that can learn from and make predictions or decisions based on data

Recent developments:

1. **Generative Adversarial Networks (GANs):** GANs are a type of deep learning algorithm that can generate new data, such as images or music, that is similar to a training dataset.
2. **Reinforcement Learning:** Reinforcement learning is a type of machine learning that involves training models to make decisions in an environment by receiving rewards or punishments.
3. **Transfer Learning:** Transfer learning is a technique that allows models trained on one task to be used on another related task, reducing the amount of training data required.
4. **Attention Mechanisms:** Attention mechanisms are a type of deep learning architecture that allows models to focus on important parts of the input data, making them more efficient and effective.
5. **Natural Language Processing (NLP):** NLP is a branch of machine learning focused on processing and understanding human language. Recent advances in NLP include the use of deep learning for tasks such as sentiment analysis and machine translation.
6. **Robotics:** Machine learning algorithms are being used to control robots, allowing them to learn from experience and perform tasks such as grasping objects and navigating environments.

# Abstract

AI and Cost Estimation: Data Science's Expanding Role in Cost Estimating

Technical Innovations Track (TI03)

Kevin McKeel

Daniel Harper

Greg Forman

Data Science has taken on an expanded presence in Cost Analysis. E.g., NLP is used to automate functional software sizing in commercial models. Data Science methods and tools such as NLP can be also used to extract data to identify spending trends and agency funding. We will present an overview of modern usages of data science, to include Machine Learning, AI and data visualization. We will also survey cost and budget data sources which are publicly available and ripe for analysis using data science methods.

Keywords: Artificial Intelligence, Data Science, Machine Learning, NL