

VIRGINIA
WESTERN

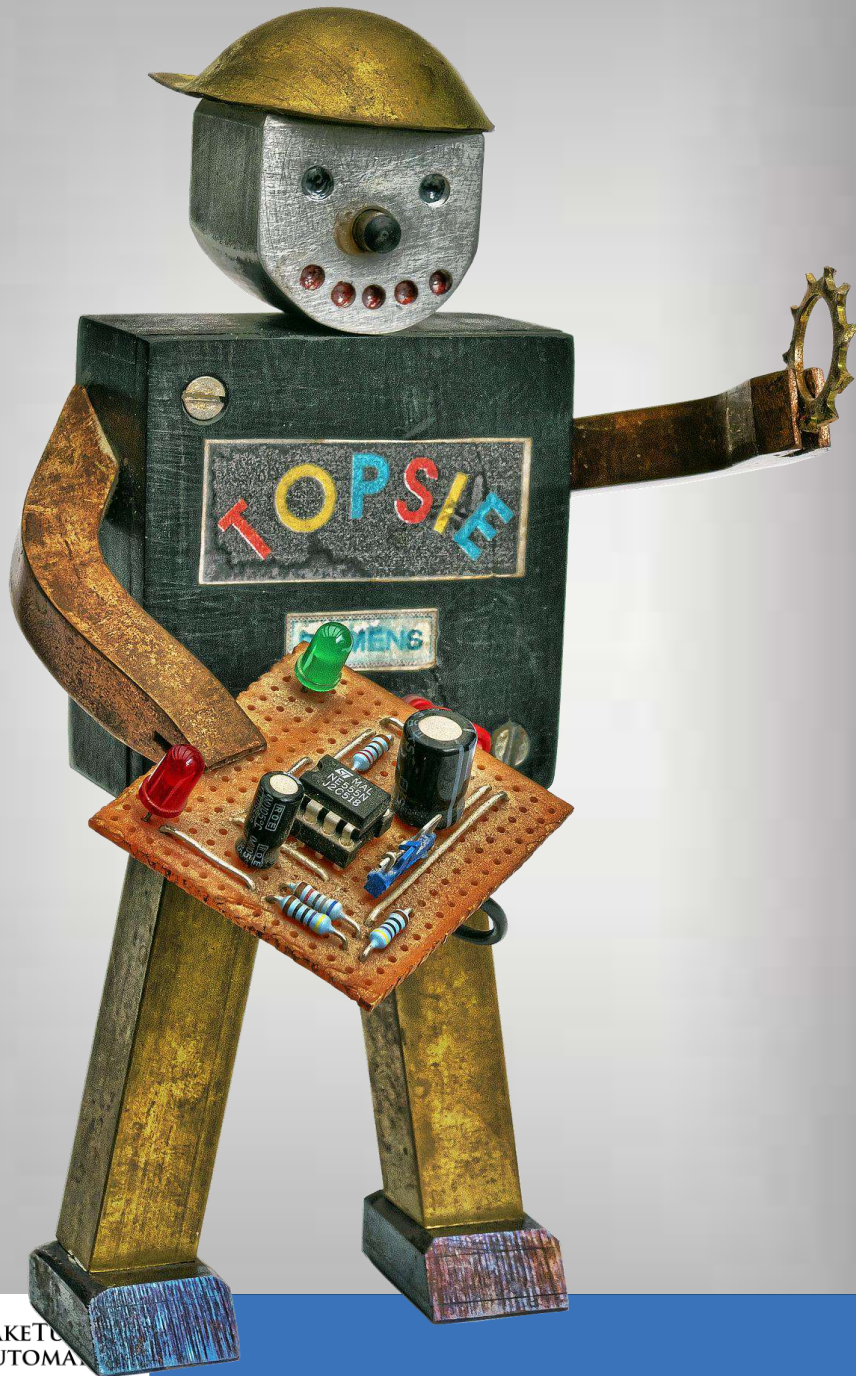
Intelligent Automation Unveiled

HARNESSING THE POWER
OF RPA, IA, AND AI



Intelligent Automation for the Masses™

DECEMBER 04, 2023



At LakeTurn Automation, we build software robots that automate time-consuming, repetitive tasks within organizations. These automations result in increased productivity, improved accuracy, decreased costs, reduced operational risk, and, most importantly, empowered employees who provide improved customer experiences.

Visit us at www.LakeTurnAutomation.ai

TOPICS

- INTRO / IA OVERVIEW
- HISTORY LESSON & AI DISCUSSION
- USE CASES FOR COMPUTER VISION
- USE CASES FOR AI & MACHINE LEARNING
- USE CASES FOR NLP (IN-HOUSE LLM OVERVIEW)
- RPA OVERVIEW
- ROBOTS IN ACTION VIDEO
- Q&A

Why Automate




the **STORY** *of* **WORK**

WELCOME TO INTELLIGENT AUTOMATION FOR THE MASSES

LakeTurn Automation is a professional services firm providing custom Intelligent Automation Solutions to the SME market segment.

Utilizing our structured Automation-as-a-Service delivery process, automation expertise, and AI proficiency, we deliver rapid, affordable, robust, and scalable turn-key automation solutions; accelerating ROI while reducing complexity and total cost of ownership for our clients.

With LakeTurn Automation, you simply provide our automation experts your process opportunities, and we'll manage all facets of designing, building, deploying, and supporting custom AI-enabled intelligent automation solutions for your business.



“I was thoroughly impressed with the professionalism of LTA. They quickly provided us with an effective custom automation solution that resulted in a significant ROI for our business. I highly recommend their services.”

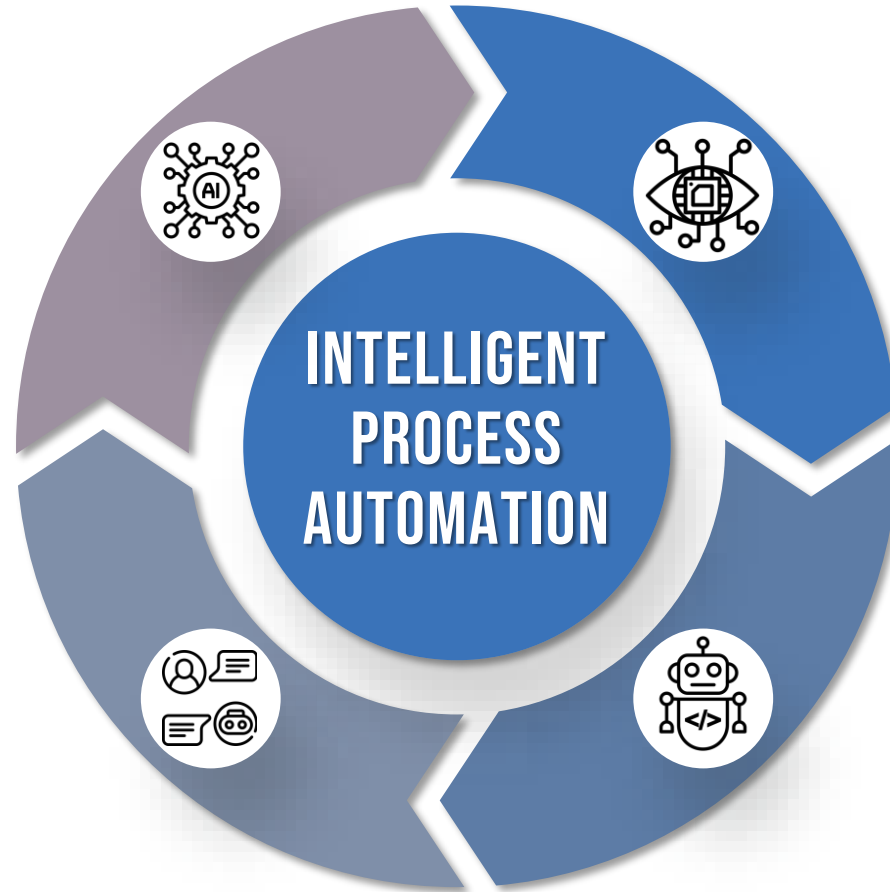
COO, Top 100 US Accounting Firm

What is Intelligent Process Automation?

Intelligent Process Automation (IPA) combines **Robotic Process Automation (RPA)** with **Artificial Intelligence (AI)** and other technologies to create workflows that don't just function automatically, but also think, learn, and improve without human intervention.

AI & MACHINE LEARNING Thinking & Learning

Big Data Management (Mongo DB)
Machine Learning (IBM Watson)
Generative AI (ChatGPT, Bard, Industry Specific)



COMPUTER VISION Vision

Optical Character Recognition (OCR)
Intelligent Document Processing (IDP)
Image and Video Analysis (Google Image, GPT4 Vision)

NATURAL LANGUAGE PROCESSING Language

Intelligent Chatbots & Virtual Assistants (LLM based)
Sentiment Analysis
Speech Analytics

ROBOTICS & SMART WORKFLOWS Execution

Robotic Process Automation (RPA)
Low-Code Platforms (Appian)
Cloud Automation Platforms (Zapier)

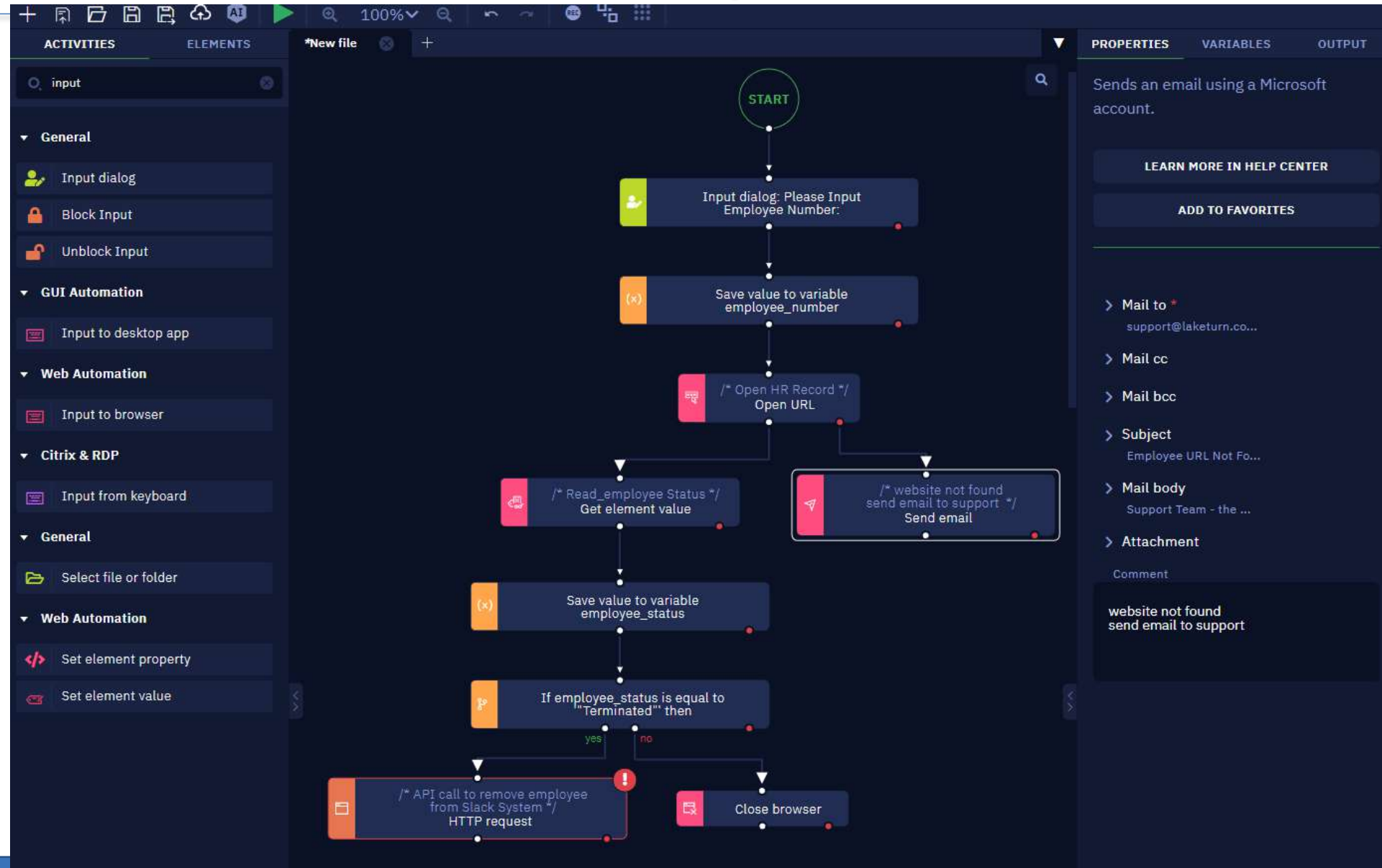
What is Low-code / No-Code Development

Low-code and no-code are software development approaches designed to accelerate the software development process by removing the complexity associated with traditional development.

Both approaches use visual programming and automation rather than manual hand coding to create software solutions.

No-code is limited, and currently *not* Enterprise-grade.

Gartner predicts that by 2026, developers outside formal IT departments (i.e. Citizen Developers) will account for at least 80% of the user base for low-code development tools, up from 60% in 2021.





HISTORY LESSON

HISTORY

Milestones - Technology Reshaping Humanity

I. The First Age: Fire and Language

- +/- 100,000 years ago

II. The Second Age: Agriculture and Cities

- +/- 10,000 years ago

III. The Third Age: Writing and Wheels

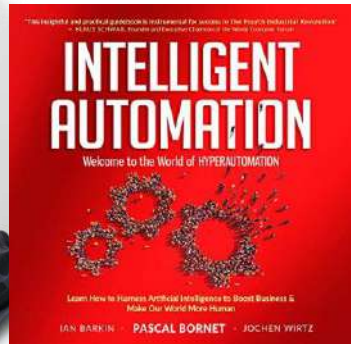
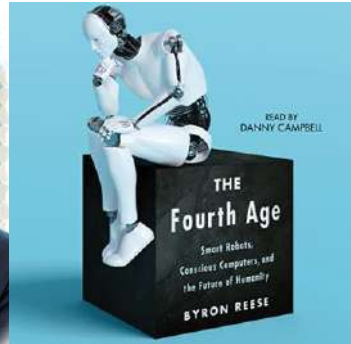
- +/- 5,000 years ago

IV. The Fourth Age: Robots and AI

- Foundation: +/- 475 years ago with scientific method
- **Acceleration: Last 50 years**

Currently in 4th Industrial Revolution

- 1.) Steam
- 2.) Mass Production
- 3.) Computers
- 4.) **AI & Automation**



Technology Acceleration

Moore's Law

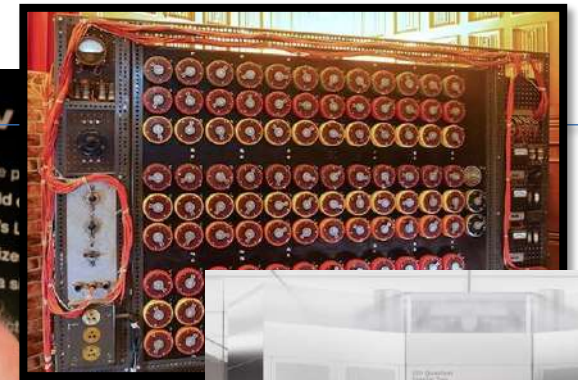
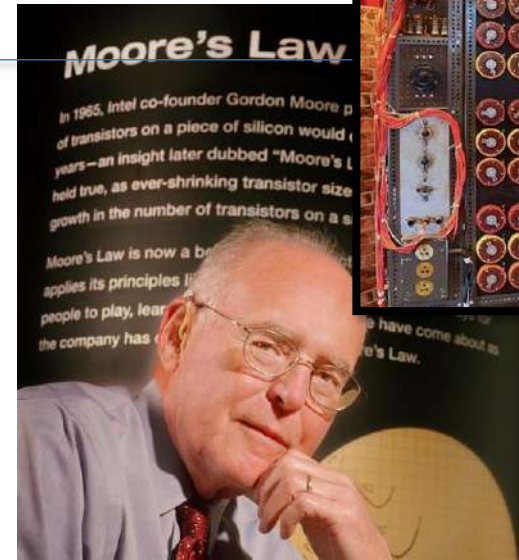
- 2x number of IC transistors every 2 years (1965)

The Power of Exponential Growth

- Rice and the chessboard / 32 Dominoes in NYC

Results of Acceleration

- Computers (most important 4th Age Invention)
 - 1821 Charles Babbage (design)
 - 1936 Alan Turing (built) / IBM Quantum 2
 - iPhone 15 Pro / Abacus to iPad
- Artificial Intelligence (1955)
 - **Narrow AI** (Artificial Narrow Intelligence)
 - **AGI** (Artificial General Intelligence)
 - **ASI** (Artificial Super Intelligence)
- Intelligent Automation
 - Combination of RPA and Narrow AI
- Robots
 - Shakey (1967) / Optimus (Tesla Bot)
 - Dull, Dirty, Dangerous, and Dear jobs



64	63	62	61	60	59	58	57
49	50	51	52	53	54	55	56
48	47	46	45	44	43	42	41
33	34	35	36	37	38	39	40
32	31	30	29	28	27	26	25
17	18	19	20	21	22	23	24
16	15	14	13	12	11	10	9
1	2	3	4	5	6	7	8



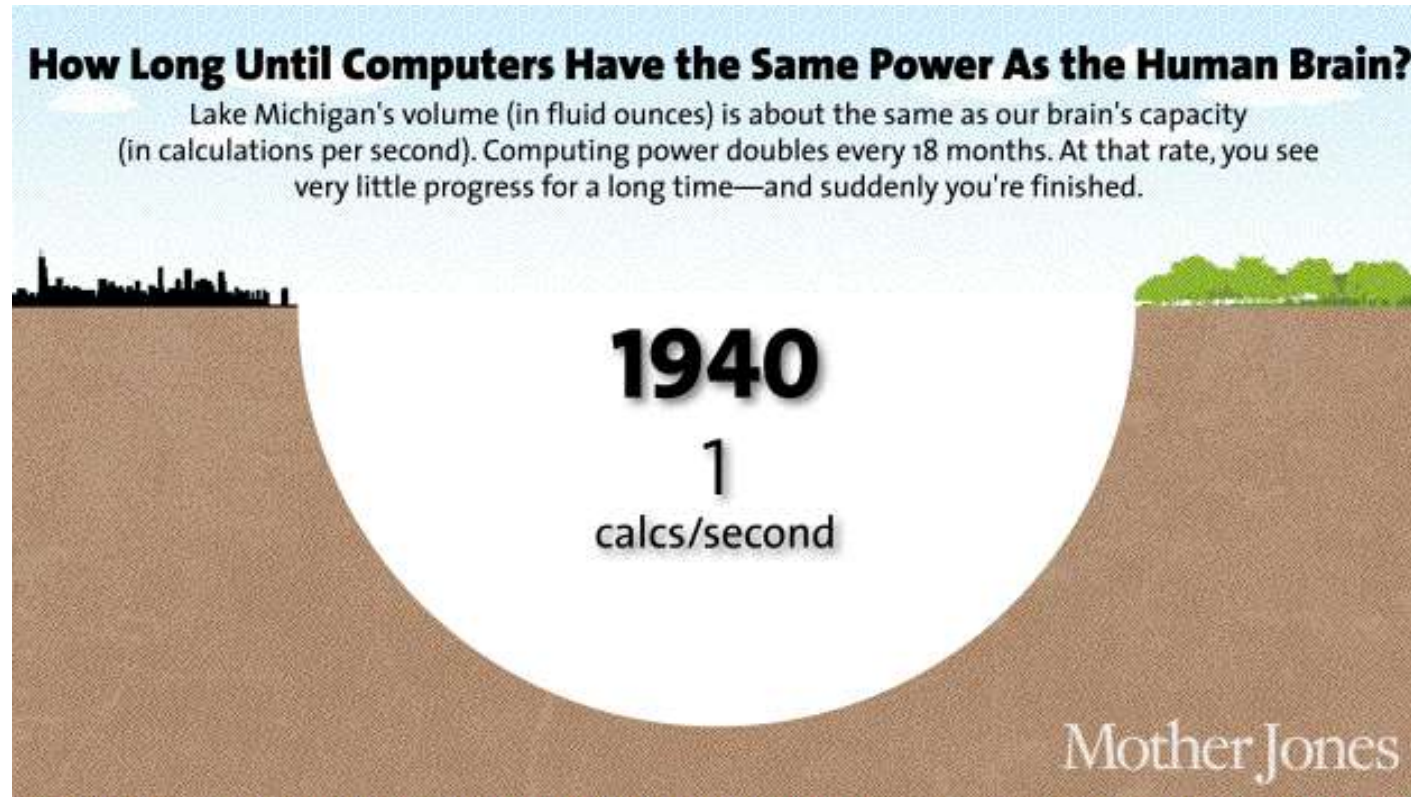
News

Nvidia predicts AI models one million times more powerful than ChatGPT within 10 years

Exponential Growth Example - Filling Lake Michigan

Start by putting 1 ounce of water into Lake Michigan in 1940 and double that amount every 18 months.

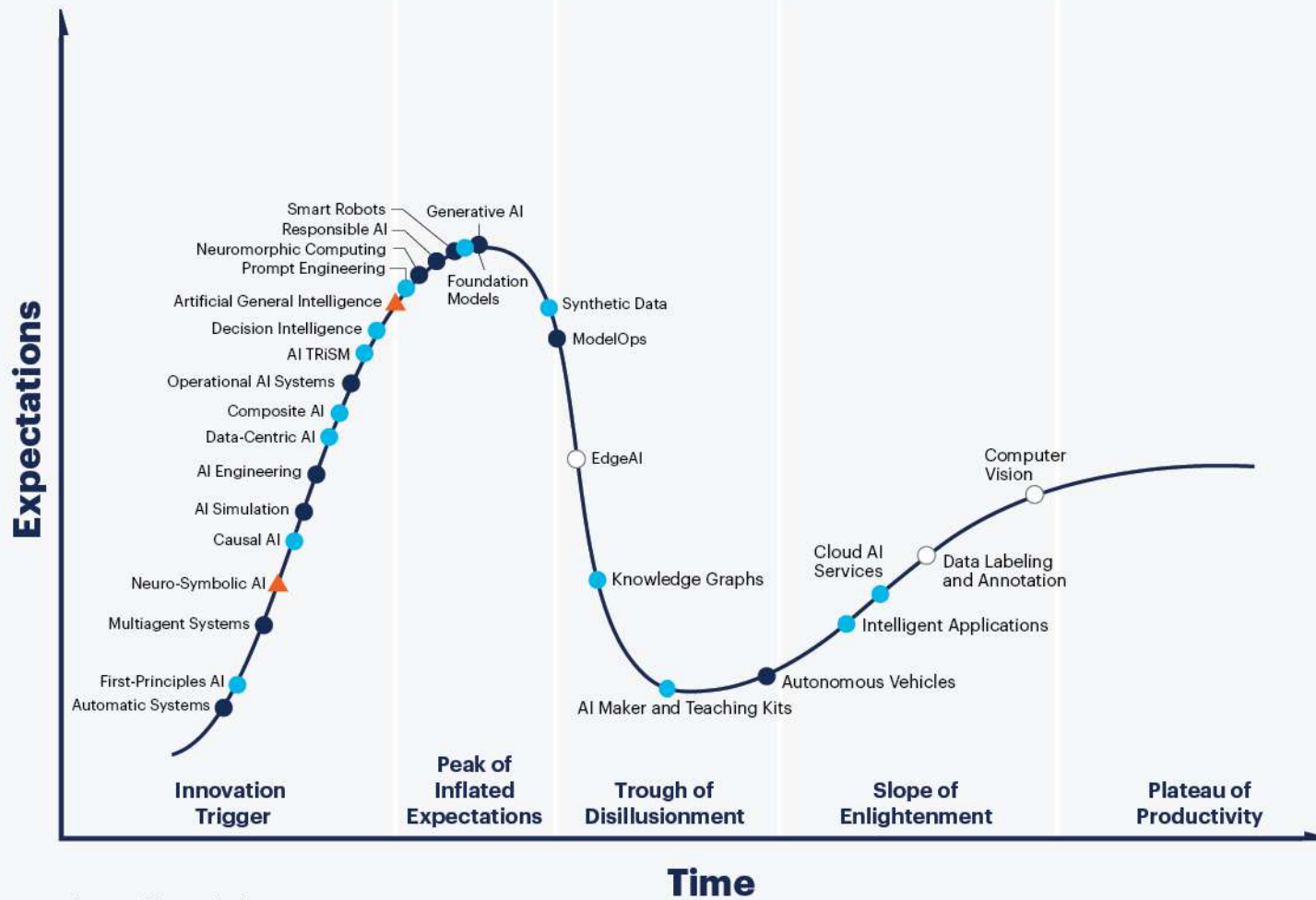
After 70 years (2000) you have almost nothing to show for your efforts, but then by 2025 the lake is full!



1950 (1 gallon) 1960 (150 gallons) 1970 (16,000 gallons) 2000 (1 inch) 2020 (40 feet) 2025 (Full)

Where are we headed with AI? Gartner® AI Hype Cycle

Hype Cycle for Artificial Intelligence, 2023



Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau
- As of July 2023

How do Hype cycles work? (similar to Kübler-Ross Change Curve)

Each Hype Cycle drills down into the five key phases of a technology's life cycle.

- **Innovation Trigger:** A potential technology breakthrough kicks things off. Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist and commercial viability is unproven.
- **Peak of Inflated Expectations:** Early publicity produces a number of success stories — often accompanied by scores of failures. Some companies take action; many do not.
- **Trough of Disillusionment:** Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investments continue only if the surviving providers improve their products to the satisfaction of early adopters.
- **Slope of Enlightenment:** More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers. More enterprises fund pilots; conservative companies remain cautious.
- **Plateau of Productivity:** Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are clearly paying off.

STAMFORD, CT, October 11, 2023

Gartner Says More Than 80% of Enterprises Will Have Used Generative AI APIs or Deployed Generative AI-Enabled Applications by 2026

<- [ARTICLE HERE: https://tinyurl.com/AIslide](https://tinyurl.com/AIslide)

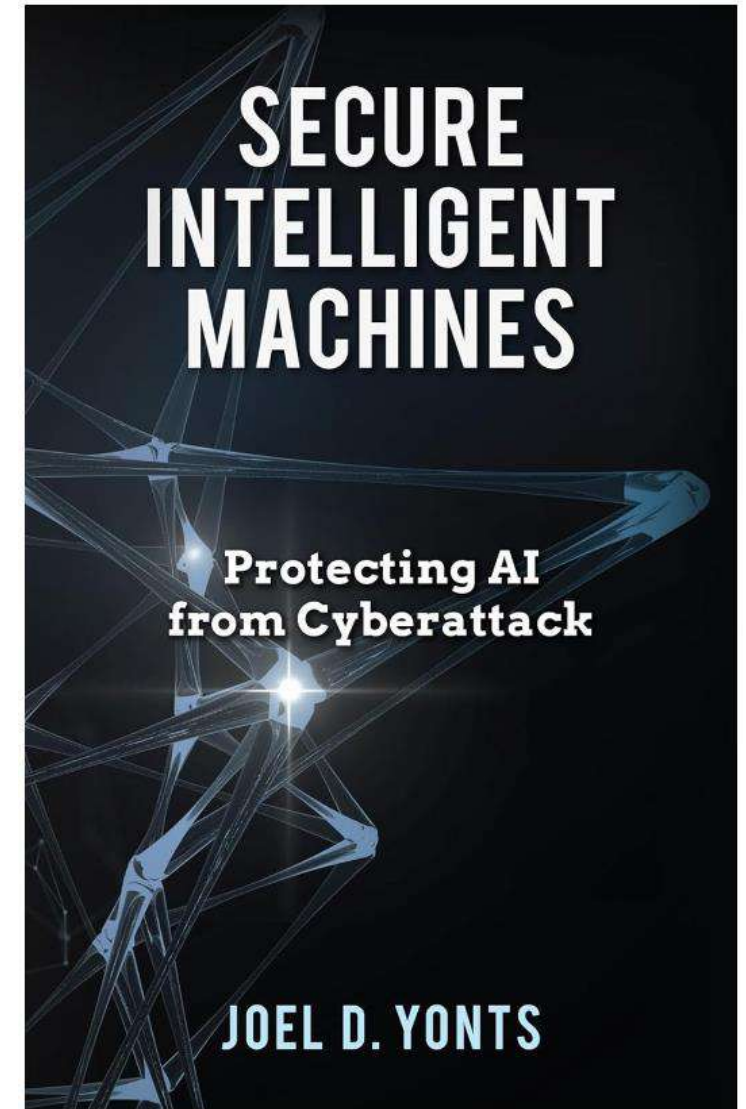
With great power comes responsibility - AI Security

AI-Powered Attack Vectors are on the Rise

- AI-generated malware
- AI-generated phishing
- AI-assisted social engineering (fake news, videos, etc.)
- AI poisoning (inject malicious data into LLM training)
- Prompt injection
- Evasion attacks
- Weaponized models
- Data privacy attacks / LLM data breaches
- Model denial of service
- Model theft

Follow Best Practices

- Corporate AI Usage Policy (prohibited, restricted, open)
- AI Strategy via AI & Automation COEs - Always include IT
- Don't be stupid





AI USE CASES IN IA

TECHNOLOGY

IA Tech & Use Case Examples - Computer Vision



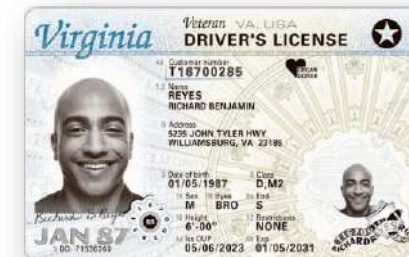
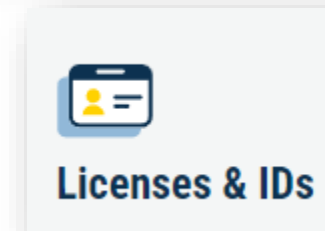
- The ability to “see” structured and unstructured digital data
 - Computer Vision: Images on screen
 - Document Vision: OCR and IDP
 - Image Analysis: AI-based image processing

- Use Case Examples

- Computer Vision
 - Provides capabilities to “see” a computer screen
 - Click on image, wait until disappear, image found, etc.
- Document Vision
 - Provides capabilities to “see” what is on a document
 - OCR – must map x/y coordinates for every document type
 - IDP – uses trained AI to auto map (ex. Drivers Licenses)
- Image Analysis
 - Provides capabilities to “see AND understand” an image
 - New OpenAI GPT4 Image API
 - Unlimited use cases – accuracy TBD by use case

Groups Remaining: 1

	Delete	First	Last	Address 1	Address 2	City	St	ZIP Code
	<input type="checkbox"/>	Terrill	Vereen	6334 Cashmere Ln		Harrison	TN	37341-2402
	<input checked="" type="checkbox"/>	Terrill	Vereen	6334 Cashmere Ln		Harrison	TN	37341-2402



When can I park here?

IA Tech & Use Case Examples – Artificial Intelligence



- Using Artificial Intelligence to deal with Unstructured Data (trust but verify)
 - Unstructured Data: any data that does not have predefined structure, like text documents, emails, images, videos, social media posts, sensor data, etc.
 - Human-Generated: text docs, emails, posts, images, videos, resumes, etc.
 - Machine-Generated: log files, GPS data, IoT output, telemetry data, etc.
- Use Case Examples
 - The “Dear Client” Challenge – used ChatGPT 3.5-turbo API to return formal email salutation

Unstructured Client Name Field	Email Salutation	AI (ChatGPT) Created Salutation
Simpson,Joyce S.	Dear Joyce,	Dear Joyce,
Jones,Peter & Meg	Dear Peter and Meg,	Dear Peter and Meg,
Baker,Sammy T. & Mary P. Jones	#N/A	Dear Sammy and Mary,
Higgins,Matthew P. III & Susan H. Smith	#N/A	Dear Matthew and Susan,
King,Dr. William O. and Betty A.	#N/A	Dear William and Betty,
Wilson,Harold D. & Smith, Janet E.	#N/A	Dear Harold and Janet,
Smith,Charles W IV & Betty E	#N/A	Dear Charles and Betty,

IA Tech & Use Case Examples – NLP



- Natural Language Processing – The ability of a computer program to understand human language as it spoken and written.

AI Large Language Models (LLMs) have completely transformed this space in the last 12 months, and we now use AI-powered NLP via APIs for the following language-related tasks:

1. **Sentiment Analysis:** Classifying the emotional intent of text (ex., assessing online reviews).
2. **Toxicity Classification:** Identify and classify hostile intent (e.g., threats, insults, obscenities).
3. **Machine Translation:** Language translation (ex. English to Spanish, JavaScript to Python).
4. **Text Generation:** Create text similar to human-written content (e.x., email responses, HR docs, etc.).
5. **Information Retrieval:** Finding documents or content most relevant to a query (see Case Study)
6. **ChatBots:** Automate one side of a conversation while a human provides the other (see Case Study)



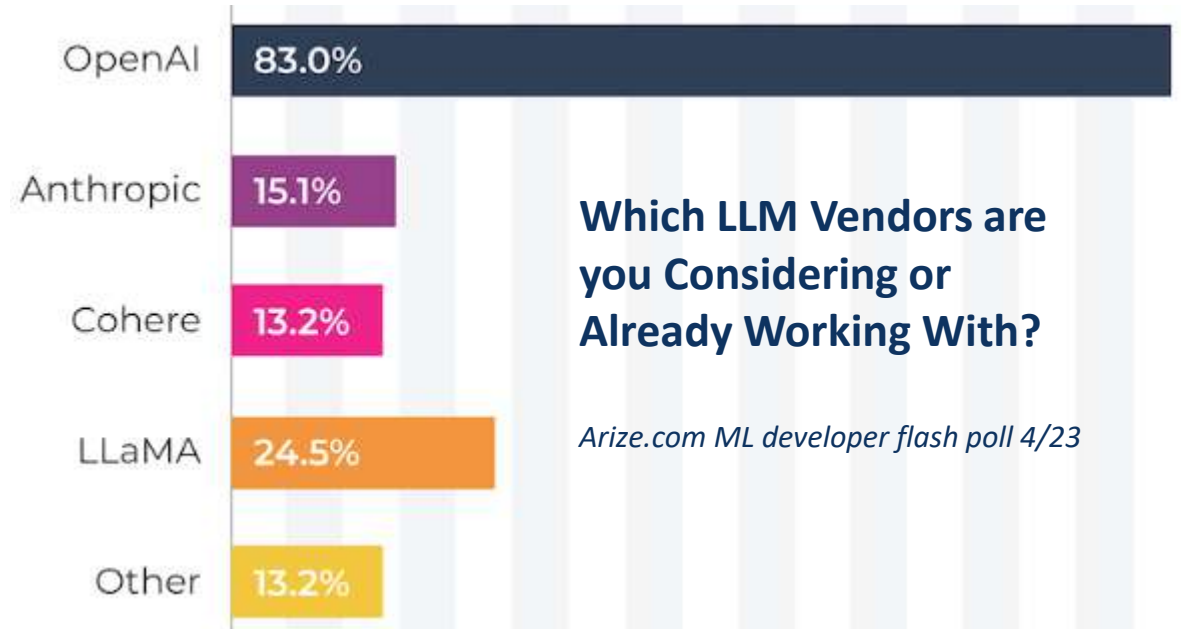
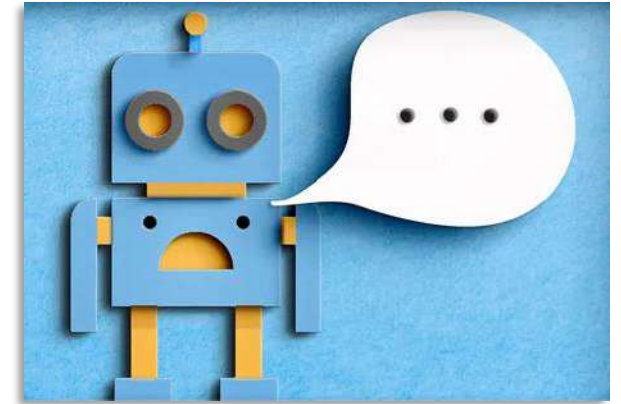
What is an LLM (large language model)?

A **Large Language Model (LLM)** is a type of machine learning model that can perform a variety of natural language processing (NLP) tasks such as:

- Generating and classifying text
- Answering questions in a conversational manner
- Translating text from one language to another

The label “large” refers to the number of values (parameters) the language model can change autonomously as it learns. OpenAI’s Chat-GPT4 model has 1.7 trillion parameters and requires 25,000 processors for training and response.

OpenAI spends \$700K daily to run ChatGPT.



Can't I just use ChatGPT directly for internal docs?

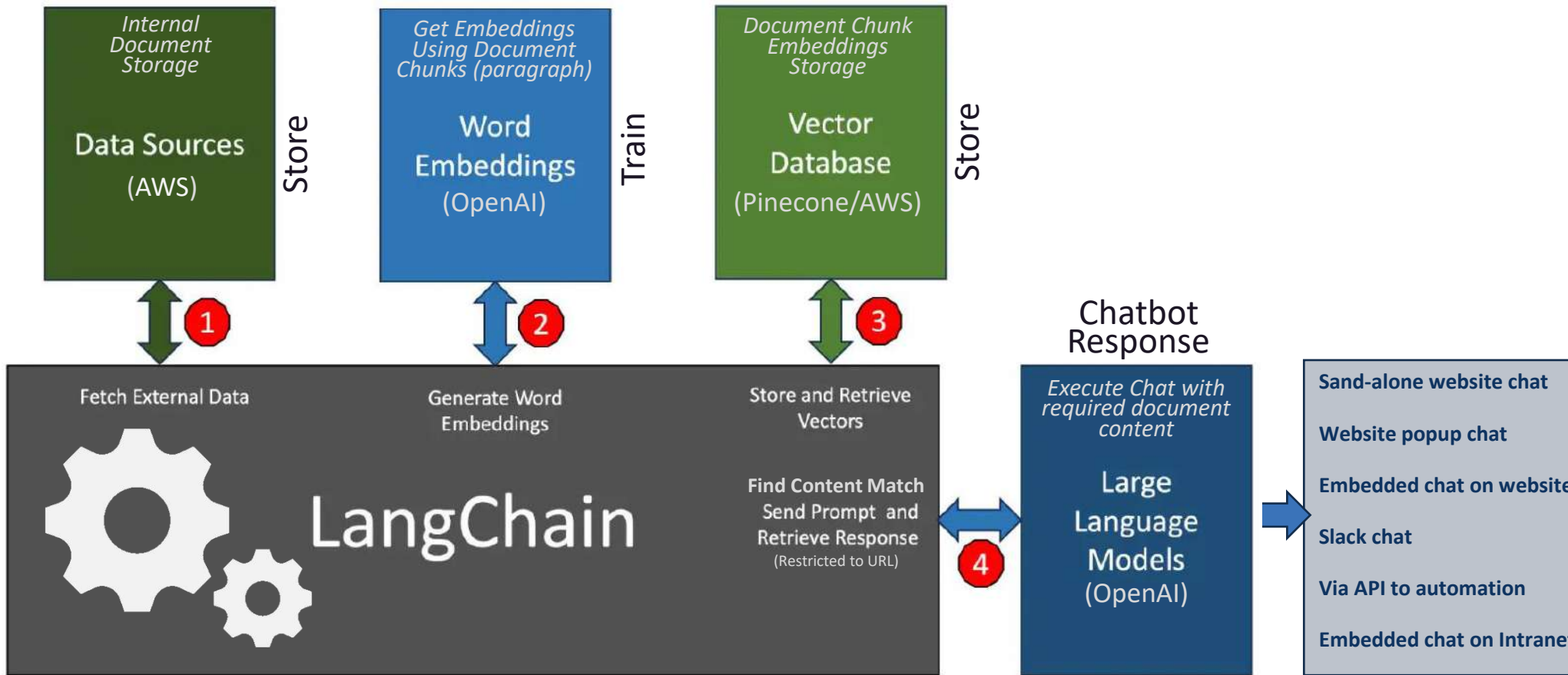
- While chat.openai.com has been trained on 300 billion words, it knows nothing about your internal documents.
- You can submit internal document content via chat.openai.com, but uploading is **limited to 500 words** (or 1 single-spaced page).
- LLM's are **stateless** (meaning they don't remember any previous messages), so you must upload internal document content (max 1 page) each time you want to chat about it.
- When conversing on uploaded content, chat.openai.com utilizes its entire dataset to respond – sometimes resulting in incorrect or out-of-scope responses (aka. “hallucinations”)
- Inconsistent **prompt engineering** (i.e., role, intent, context and constraint) = undesired responses.



“We've got a problem. I've turned it on but I can't turn it off again.”

LangChain solves internal ChatGPT challenges

LangChain is an open-source framework designed to simplify the creation of applications using LLMs. *“Air-traffic control” for internal doc chatbots.*



```

-0.005876610521227121,
0.012754054740071297,
-0.00019166884885635227,
0.001565449987538159,
0.016329403966665268,
-0.014498931355774403,
-0.024862835183739662,
-0.004520216025412083,
0.020345911383628845,
0.0026436515618115664,
0.007433829829096794,
0.20079900324344635,
0.009481589309871197,
0.008981172926723957,
0.034344423562288284,
-0.017501434311270714,
-0.00024259535712189972,
0.007651116233319044,
-0.010791893117129803,
-0.0022189554292708635,
0.03094685636460781,
-0.0033514786045998335,
0.014788646250963211,
-0.023006023839116096,
-0.0029399513732641935,
0.009883240796625614,
0.00394737021997571,
-0.046670492738485336,
-0.00428976071998477,
-0.02847110666334629,
-0.0322110690176487,
-0.006251923274248838,
0.006005006842315197,
-0.011055270299908485,
-0.00368399266153574,
0.009047016501426697,
-0.00136133236810565,
-0.00837540440261364,
-0.002069159410893917,
0.019252894446253777,
0.012102195993065834,
-0.016592781990766525,
-0.019871830940246582,
0.014024851843714714,
0.004579476080834866,
-0.0050107566639781,
-0.0048329769633710384,
-0.0313945971429348,
0.001605779631063342,
0.03121023252606392,
    
```

Vector database entry for the word Hot Dog

IA Tech & Use Case Examples – RPA



- Robotic Process Automation (RPA) is the Automation Workhorse (AI is the **Brains**, but RPA is the **Body**)
- RPA is an automation technology that eliminates repetitive manual tasks in a digital environment. To do so, it employs bots, software programs that operate at the system and User Interface (UI) level to mimic human employees' actions to perform various assignments.
- RPA bots can interact with many systems and technologies and do almost anything if their task is rule based.

Some of their basic skills are as follows:

- Manipulating files and folders
- Launching and terminating apps
- Extracting data from docs via OCR & IDP
- Querying databases
- Transferring data between systems
- Making calculations
- Typing and filling in forms
- Sending emails and SMS
- Enhanced Excel /Google Sheets features
- Interacting with any website and/or cloud based application via the UI
- Interacting with any Windows based application via the UI and at the system level
- Interacting with the AS/400 via IBM Personal Communications 5250 emulator
- Interact with VM's (Citrix, VMware, Hyper-V)
- Extended automations via API's, webhooks chatbot platform integration and Zapier.
- Advanced automations using JavaScript

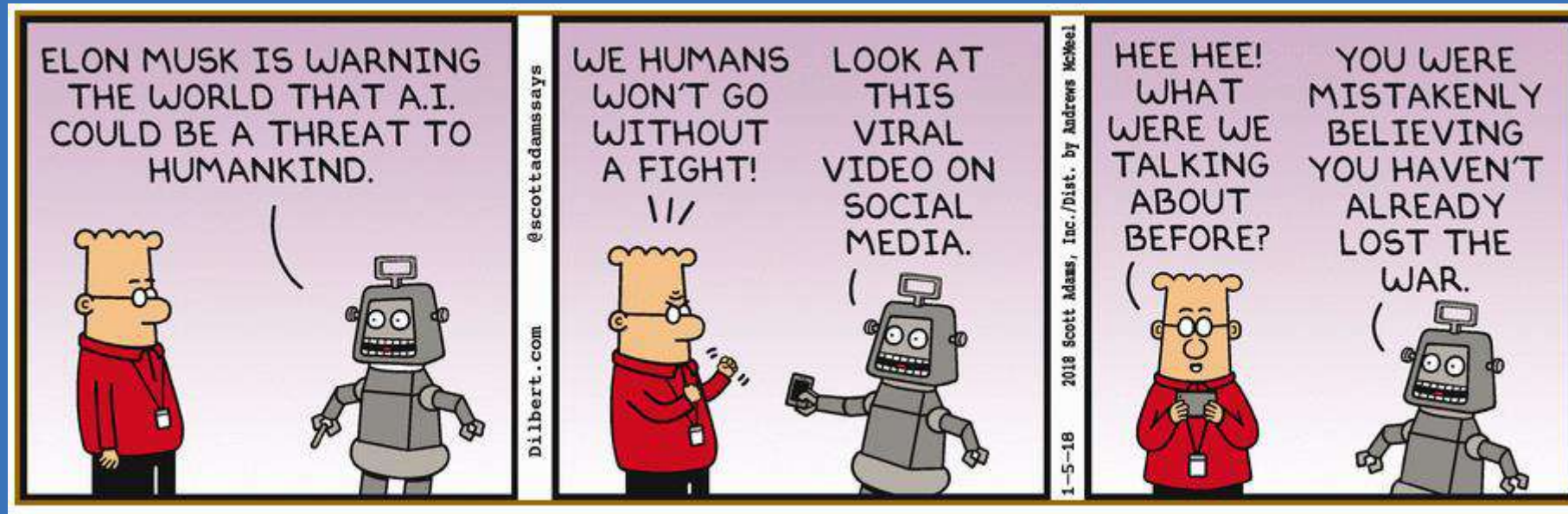


Robots In Action – Sample RPA Web-Based Automations



Robotic Process Automation
Sample Bots in Action

DISCUSSION / Q&A



RANDY LOWMAN

Managing Director

o. 540-352-3250
c. 540-529-2970
rlowman@laketurn.com
20 E College Street #297
Rocky Mount, VA 24151
www.LakeTurnAutomation.com