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ENIX

2024

**AI Empowered: A
Road Map for
Housing Agencies**

Speakers

- **Greg Blake**, Chief Information Officer and Vice President of Administration | Idaho Housing and Finance Association
- **Colin McNiece**, Chief Legal & Operating Officer | MassHousing

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**Greg Blake, CIO and Vice President
of Admin
Idaho Housing and Finance
Association**

**Artificial Intelligence
How AI is used at
Idaho Housing**

2024

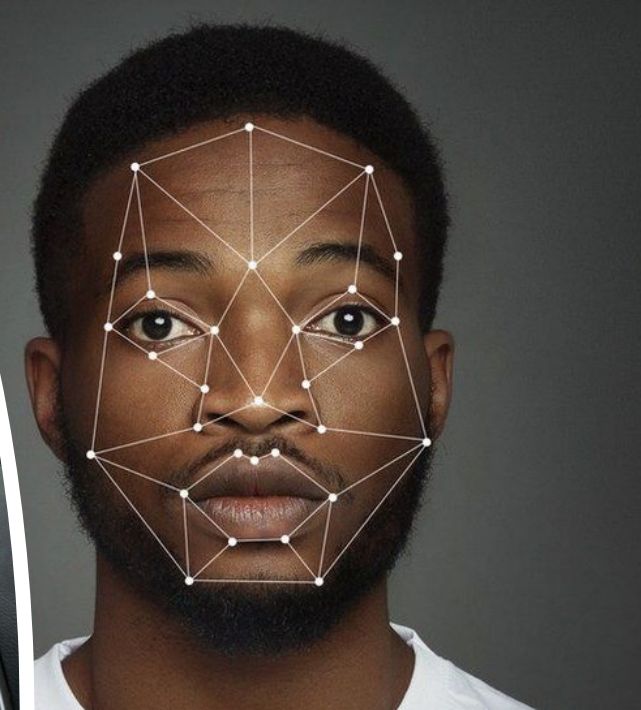
Artificial Intelligence is Not New

Facial Recognition

GPS Driving

Siri and Alexa voice lookup

- These are not perfect



Go ahead, I'm listening

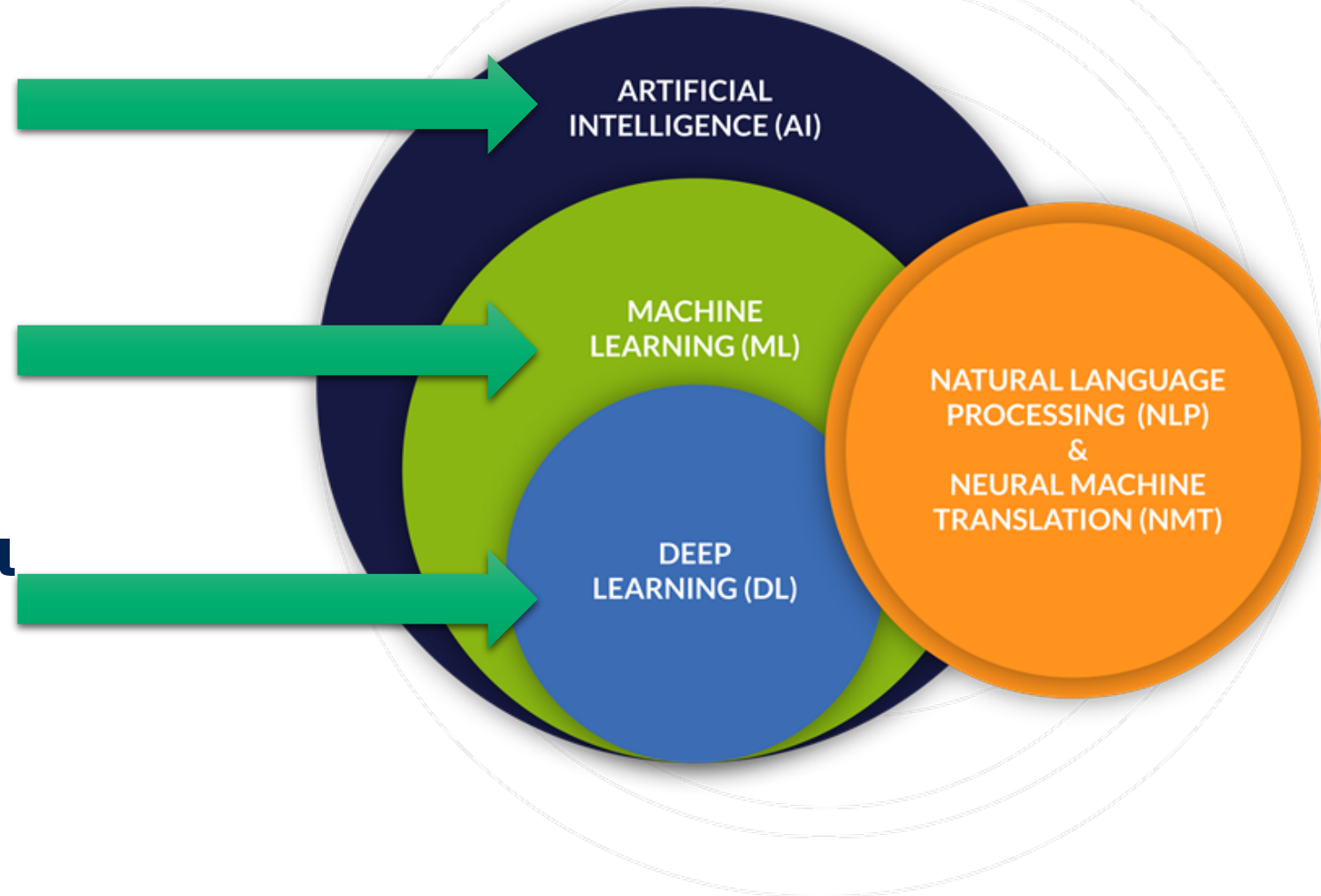


Artificial Intelligence hierarchy

**Any tech that can
mimic human
behavior**

**Uses statistics to
learn from
experience**

**Generative AI / neural
networks with vast
amounts of data**





AI predicts the next word

The cow jumped over the _____

- Moon 85%
- Fence 10%
- Barrier 1%

Now add context...

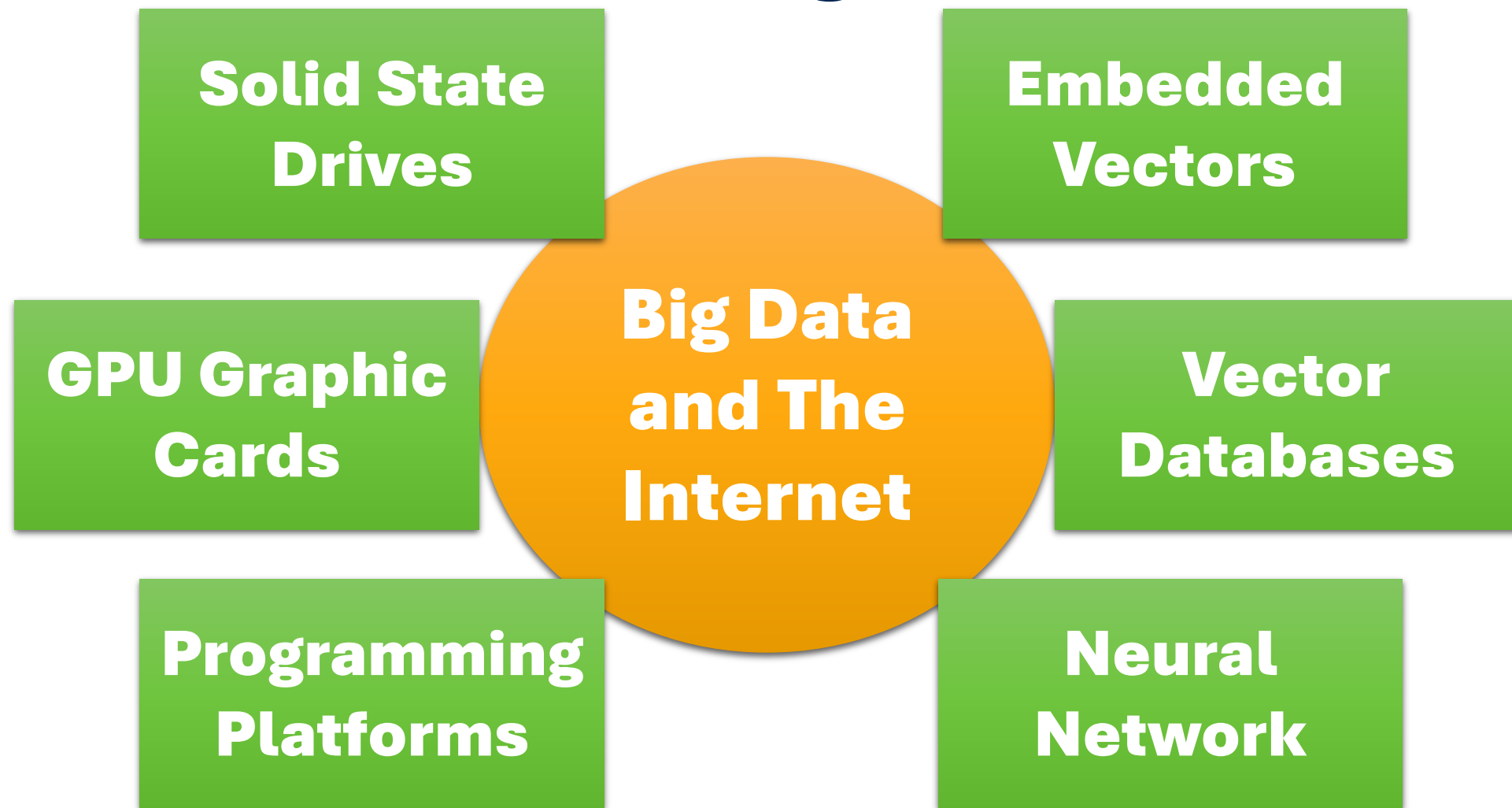
The cow is in its pen

- Fence 40%
- Bush 25%
- Stream 15%

The cow is in the city

- Fence 35%
- Barrier 20%
- Car 15%

How did we get here?

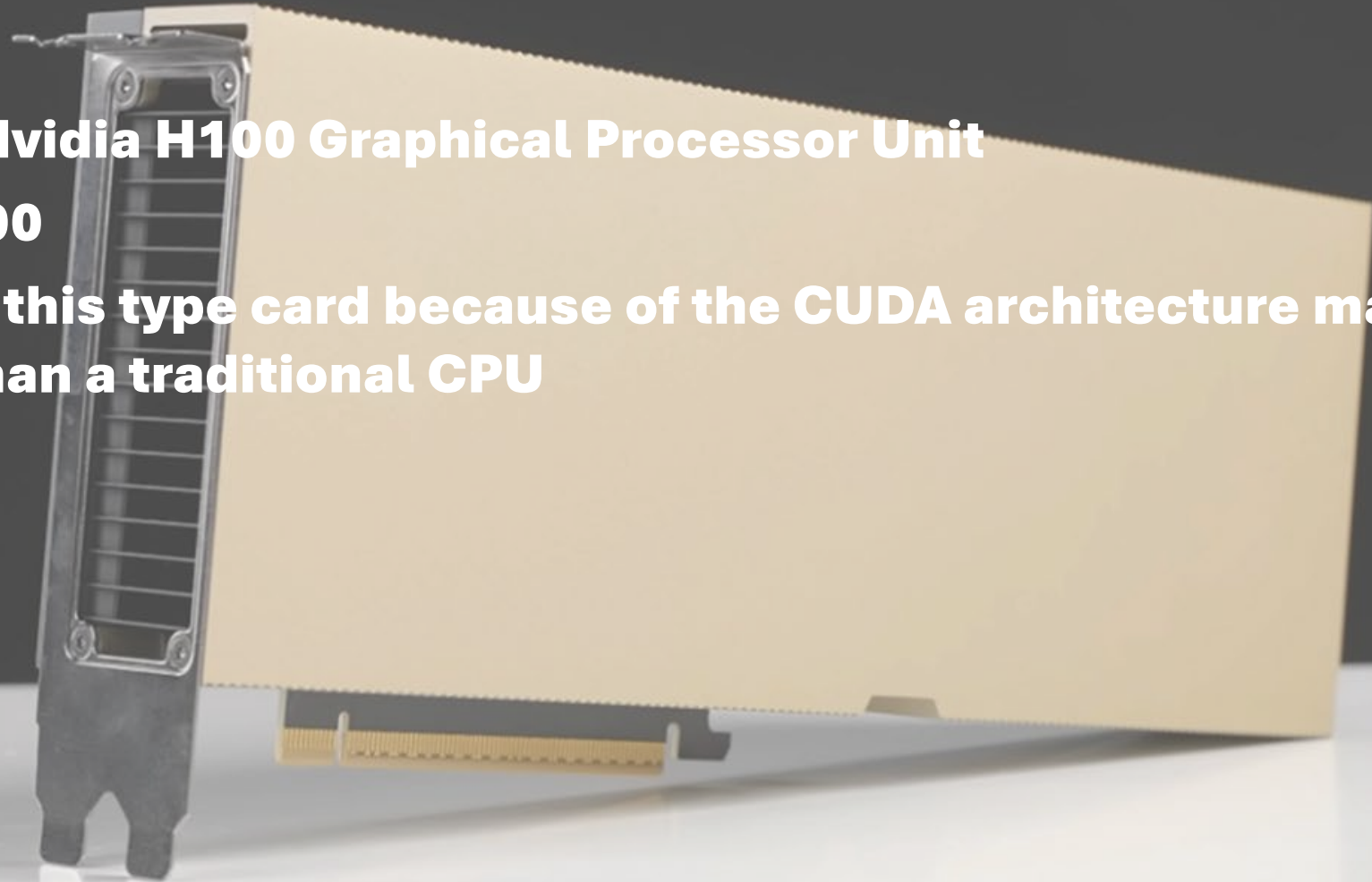


This is what we needed to get started

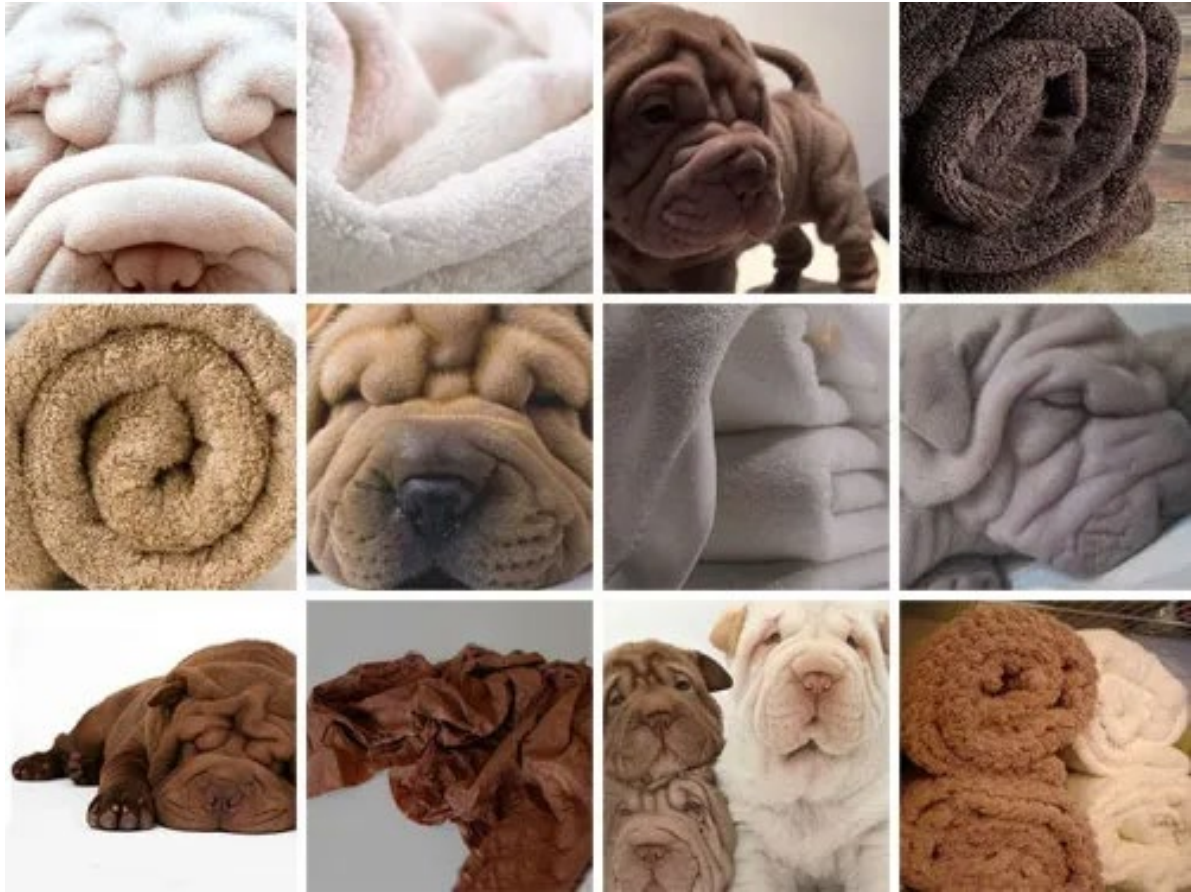
This is a GPU Nvidia H100 Graphical Processor Unit

It costs \$30,000

AI models use this type card because of the CUDA architecture makes it much faster than a traditional CPU



Probabilities – AI can now predict images



Dog or Towel?



Chihuahua or Muffin?

Training set full of images
+ image description

How does it create images -AI Diffusion Technique

Takes an image
+ Description



Diffuses



Diffuses



Diffuses



x1000



...



Time Step 0



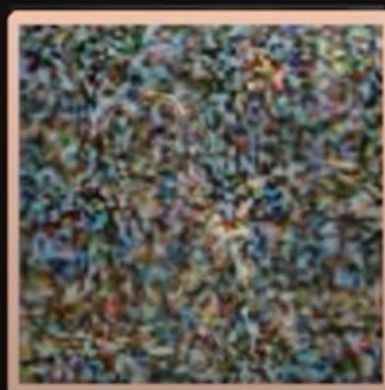
Time Step 1



Time Step 2



Time Step 3



Time Step 1003



...

Denoise

Denoise

Denoise

x1000

Staff starting using AI systems

And we could not tell what kind of input our staff was feeding these AI systems.

We looked at LLM – AI Personal Assistants and their privacy policies

OpenAI – ChatGPT – GPT4o (Mainstream \$20/Month)

Anthropic – Claude 3.5 Sonnet (Most Human)

xAI – Grok (Excellent choice \$11 per month)

Google – Gemini, Gemma (Most moderated, not that good)

Meta – Llama 3.1 (Best and Free)

Perplexity – (Uses many different models)

Inflection AI – PI (Great for conversation)

Microsoft CoPilot – uses GPT4o

Staff starting using AI systems

Staff were using dall-e and Jasper AI to create images



So, we looked at many image generation AI products

Dall-E – Open AI (\$20 per month)

Mid Journey – Midjourney (\$10 per month for 200 images)

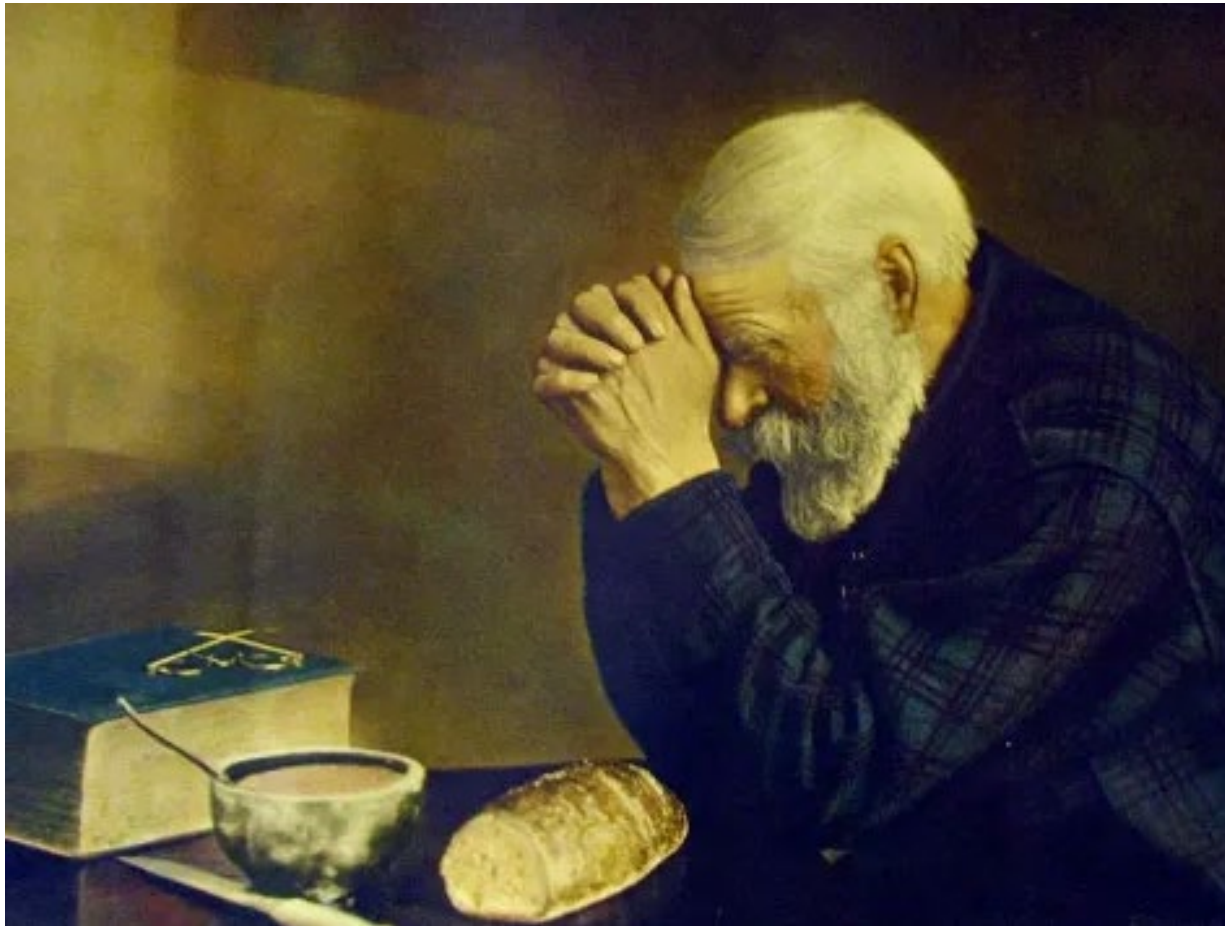
Stabile Diffusion – Stability AI (\$10 for 1,000 images)

Adobe Firefly - (\$5 for 100 images)

Canva

Generative AI by Getty - (\$15 for 100 images)

We Implemented Stabile Diffusion

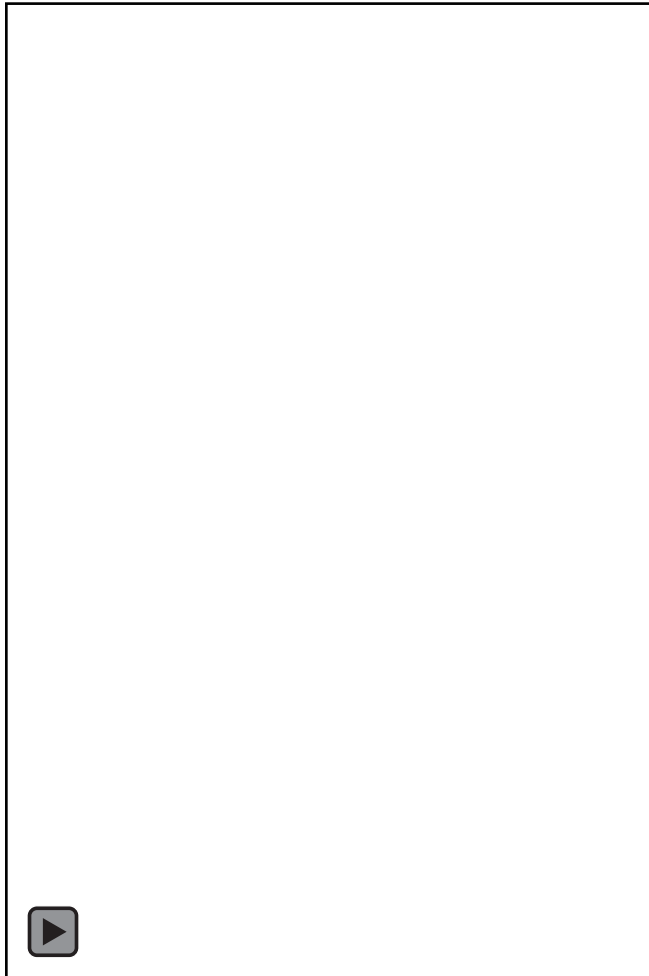


Grace – Eric Enstrom



Stabile Diffusion

We also looked at Music AI Systems



Suno AI

Mureka

Udio

SongR

Soundraw.io

Mubert

- **Loudly**
- **Beatoven**
- **MusicGen**
- **Splash Pro**
- **Riffusion**

We Needed an AI strategy for AI

Vision

Business Value

- Accelerate growth and opportunities
- Drive cost and operational efficiency

Adoption

- Public Cloud, Private Cloud, or on-premise

Risk

- Manage risk and regulatory requirements

Develop a Governance Structure

- Policy and procedures
- AI committee

Public Cloud vs. Private Cloud for AI

Public Cloud for AI

- Lack of AI talent in house
- Low barrier to entry
- Higher quality models (sometimes)



Private cloud for AI

- Data Privacy and Security
- Model lineage control – high degree of control
- Lower cost at scale
- Smaller, faster models

We Looked For Operational Efficiencies

1
Find out if department are using the public cloud AI

2
Look at all existing workflows

3
Look in areas where you rely on humans.

4
Look in areas where generative AI is superior to humans

5
Look for Tasks that can be complete faster.

We Developed Considerations for AI Adoption

We wanted a model we would train on our data



Stay away from AI decisions or any area that is deemed risk or violate any regulatory requirement.



Find automation and process efficiency



Reduce document size and compare needs



Make staff or productive where they deal with document text manipulation



Watch the market close to take advantage of emerging technology capabilities

We selected the open-source framework

- Meta's LLAMA 3.1**
- & Various vision models
- Free - Open Source
- Self Hosted
- Trainable
- State of the Art
- Ethical



Our journey started with my laptop – “Eva”

Learning and Development Computer – Gaming GPU Laptop



The second AI computer - Nigel

We needed more power with 8 GPUs



2024

Third AI computer – Ida and Arti

Super Powered
GPU's – dual
Nvidia 4090s –
used for
inference



Let's meet "Ida" - Idaho Housing's Personal Assistant

Artificial Intelligent Personal Assistant to Idaho Housing
<https://ai.idamazon.com>



Data Protection and Confidentiality

Idaho Housing Must Be Committed to Client Privacy



At IHFA, we prioritize the integrity and confidentiality of our clients' personal information (PII).

Internal AI Model Usage Only

The goal is to have all AI model usage is strictly internal, not connected to any cloud provider or the internet.

This ensures that no PII data is uploaded to any cloud-based LLM providers.

Maintaining confidentiality and security of our clients' sensitive information is our top priority.

By keeping our AI models internal, we reduce risk of data breaches or unauthorized access.

Trust is our top priority, and we're dedicated to protecting your clients' personal information.

Ethical and Responsible



Principles for Responsible AI Development

IHFA's AI systems are built on a foundation of trust, ethics, and security.

- Policies and guardrails for AI decision-making ensure responsible behavior in all processes
- Fairness testing procedures detect and eliminate model bias
- Privacy measures secure data with robust barriers, safeguarding sensitive information
- Transparency and governance controls promote responsible deployment with human oversight
- IHFA's AI systems prioritize transparency, accountability, and human oversight
- Ensuring AI decisions are fair, unbiased, and trustworthy

Operational Impact

Sustainable Competitive Advantage



IHFA is hoping to achieve significant operational cost savings implementing these AI solutions, but this is just the beginning.

This future-shaping technology will enable IHFA to maintain a competitive edge, driving long-term success and sustainability.

By leveraging AI, IHFA can deliver affordable housing

With this technology, IHFA can drive innovation, efficiency, and effectiveness, ultimately improving the lives of those in need.

Our Use Cases



Personalized AI Assistant



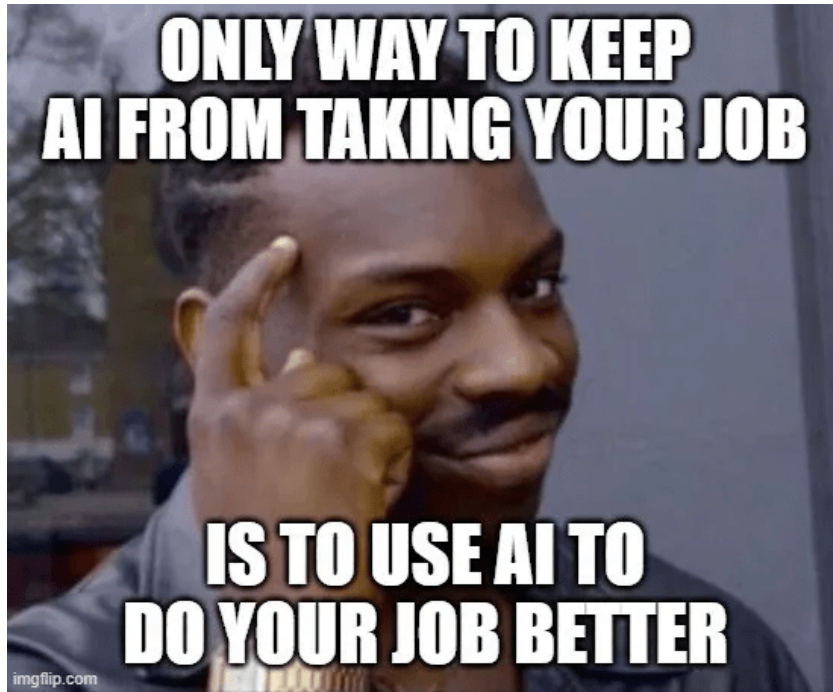
IHFA has developed an on-premise personalized AI Chat Assistant named Ida

- Spark creativity and initiate projects with ease
- Automate routine tasks, freeing up time for strategic work
- Inform decision-making and optimize process efficiency with real-time data
- Enjoy grammar checking, innovative ideas, and more, all at your fingertips!

Transform Work:

- Leverage AI to streamline tasks, boost efficiency, and optimize workflow
- Achieve more in less time, and make a greater impact in your role

Creative AI Catalyst



Unlocking Efficiency and Agility in Marketing and Communications along with Code Generation for the IT department

- IHFA's Market and Communication department currently uses tools like Jasper.ai at \$240 per month.
- Automated concept generation and idea refinement
- IT developers need code assistance

Benefits:

- Increased productivity and efficiency in marketing and communications efforts
- Precise and timely delivery of high-quality visual content
- Enhanced agility in responding to changing market conditions and customer preferences
- Coding for IT developers

Intelligent Virtual Customer Service Agent



Virtual Agent reads borrowers' loan information on a call-by-call basis. It then provides customer service agents with personalized answers to a vast array of questions, empowering the human customer service agents to offer more tailored advice and guidance that better serves our clients.

By integrating this cutting-edge AI into IHFA's internal interactions.

Benefits

- Improved Customer Satisfaction: Precise and personalized communication
- Streamlined Support: Automates routine inquiries, freeing up human reps for complex issues
- Elevated Insights: AI-powered insights for continuous innovation and customer satisfaction

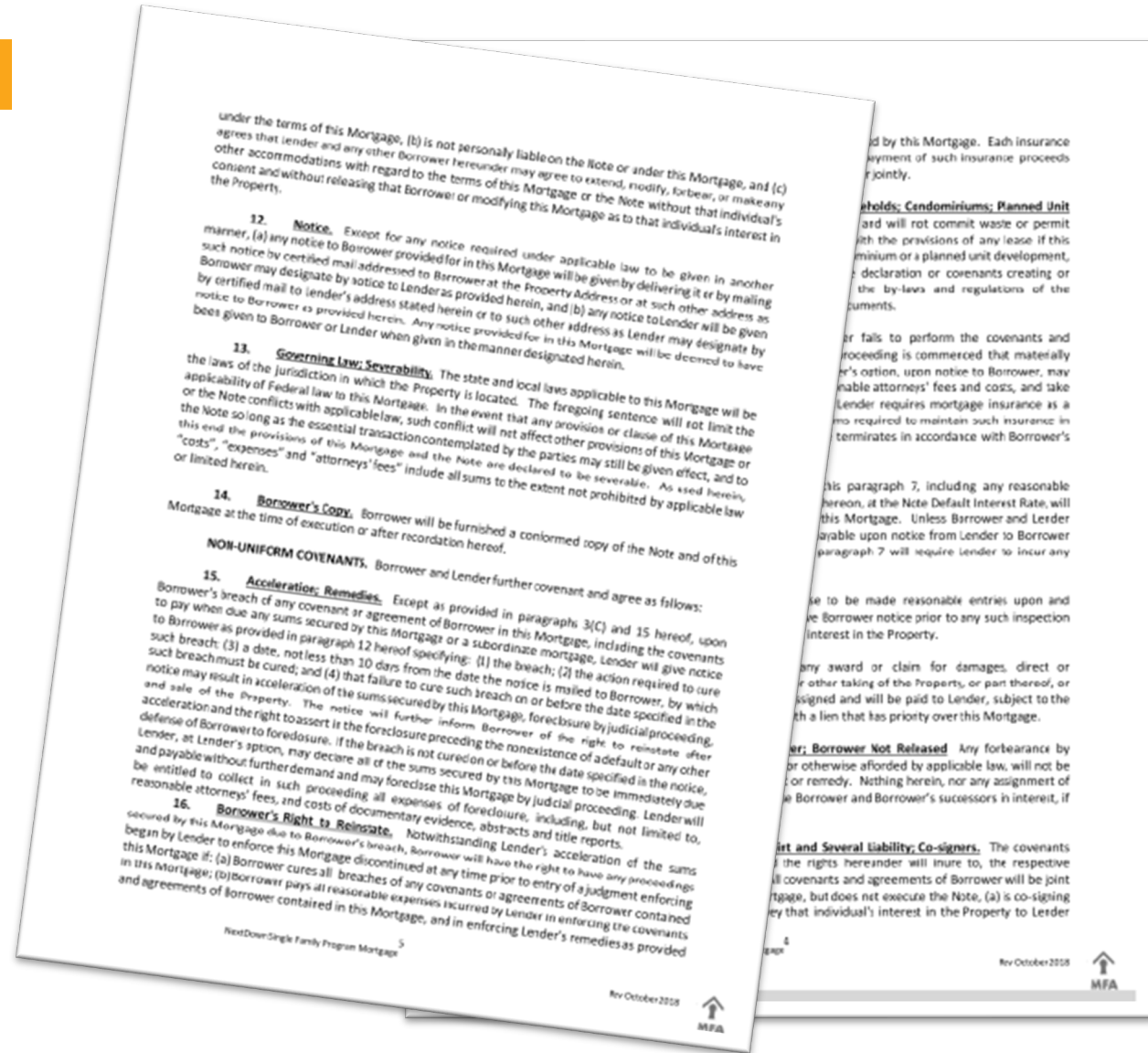
Autonomous AI Underwriter

Precision OCR with Vision LLM at 98% Accuracy

WHEN CHATGPT ANSWERS



YOUR QUESTION BEFORE YOU EVEN FINISH TYPING IT



Automation for Mortgage Note and Deed Data Capture

Precision OCR for Notes Data Capture – 98% Accuracy



ADJUSTABLE RATE NOTE

THIS NOTE CONTAINS PROVISIONS ALLOWING FOR CHANGES IN MY INTEREST RATE AND MY MONTHLY PAYMENT. THIS NOTE LIMITS THE AMOUNT MY INTEREST RATE CAN CHANGE AT ANY ONE TIME AND THE MAXIMUM RATE I MUST PAY.

[Date] _____ [City] _____ [State] _____

[Property Address]

1. BORROWER'S PROMISE TO PAY
 In return for a loan that I have received, I promise to pay U.S. \$ _____ (this amount is called "Principal"), plus interest, to the order of the Lender. The Lender is _____. I will make all payments under this Note in the form of cash, check or money order. I understand that the Lender may transfer this Note. The Lender or anyone who takes this Note by transfer and who is entitled to receive payments under this Note is called the "Note Holder."

2. INTEREST
 Interest will be charged on unpaid principal until the full amount of Principal has been paid. I will pay interest at a yearly rate of _____. The interest rate I will pay will change in accordance with Section 4 of this Note.
 The interest rate required by this Section 2 and Section 4 of this Note is the rate I will pay both before and after any default described in Section 7(B) of this Note.

3. PAYMENTS

(A) Time and Place of Payments
 I will pay principal and interest by making a payment every month.¹ I will make my monthly payment on the first day of each month beginning on _____. I will make these payments every month until I have paid all of the principal and interest and any other charges described below that I may owe under this Note. Each monthly payment will be applied as of its scheduled due date and will be applied to interest before Principal. If, on _____, 20____, I still owe amounts under this Note, I will pay those amounts in full on that date, which is called the "Maturity Date."
 I will make my monthly payments at _____ or at a different place if required by the Note Holder.

(B) Amount of My Initial Monthly Payments
 Each of my initial monthly payments will be in the amount of U.S. \$ _____. This amount may change.

(C) Monthly Payment Changes
 Changes in my monthly payment will reflect changes in the unpaid principal of my loan and in the interest rate that I must pay. The Note Holder will determine my new interest rate and the changed _____

¹ For Maryland, the Note may be amended if the borrower does not voluntarily elect to pay interim interest at closing. The following must be inserted after the first sentence of subsection 3(A). "I will pay U.S. \$ ____ on the first day of _____, 20__ as interest due on the unpaid principal for the period from the date of this Note through _____." Insert in the first blank the date by which the interim interest must be paid, either the date on which the interest to be included in the first monthly installment begins to accrue or the first installment due date. Insert in the second blank the date on which the interest to be included in the first monthly installment begins to accrue.

Effective 1/10/2015

AI Meeting Recording Assistant



Efficient Meeting Summarization with Whisper AI

Automated Transcription: Convert meeting recordings to text with high accuracy

Meeting Summary: Synthesize text into a concise summary with key takeaways and action items

Insights: Extract speaker names, topics discussed, and next steps

Benefits

Increased Productivity: Reduce time spent on meeting note-taking and summarization

Improved Collaboration: Share summaries and insights with team members and stakeholders

Enhanced Meeting Efficiency: Focus on high-level discussions and decision-making

We setup an AI Governance Structure



AI Policy and Procedures



Establish AI Ethics and Guidelines



AI Subcommittee of IT Security and Risk



Ensure Compliance with Legal and Regulatory

AI Agents will be the next step at Idaho Housing

What are AI Agents

Simulate intelligent behavior

Perceives the data it receives

Interact with the environment

Can operate without human control





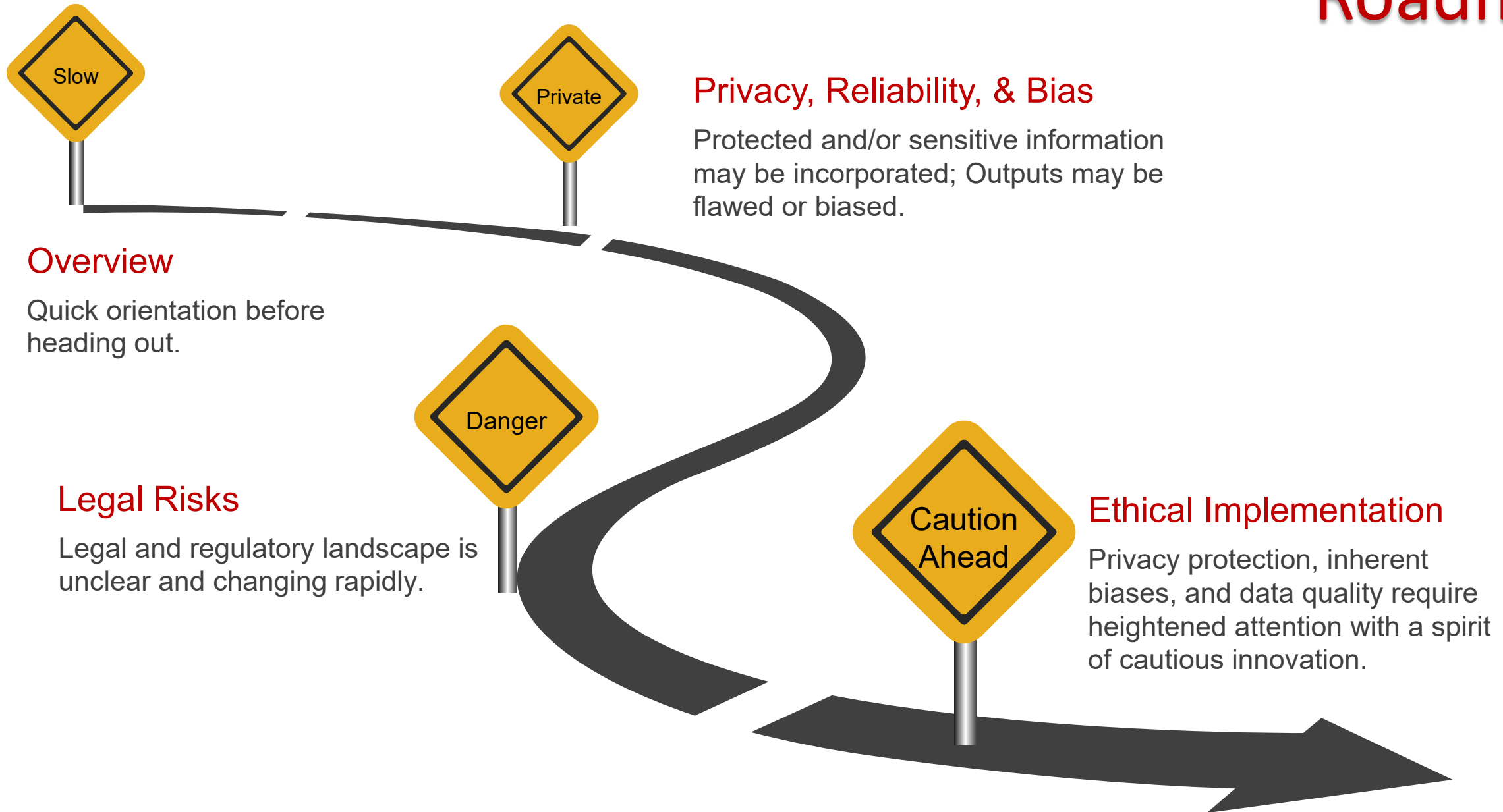


AI Empowered: A Road Map for Housing Agencies

September 30, 2024

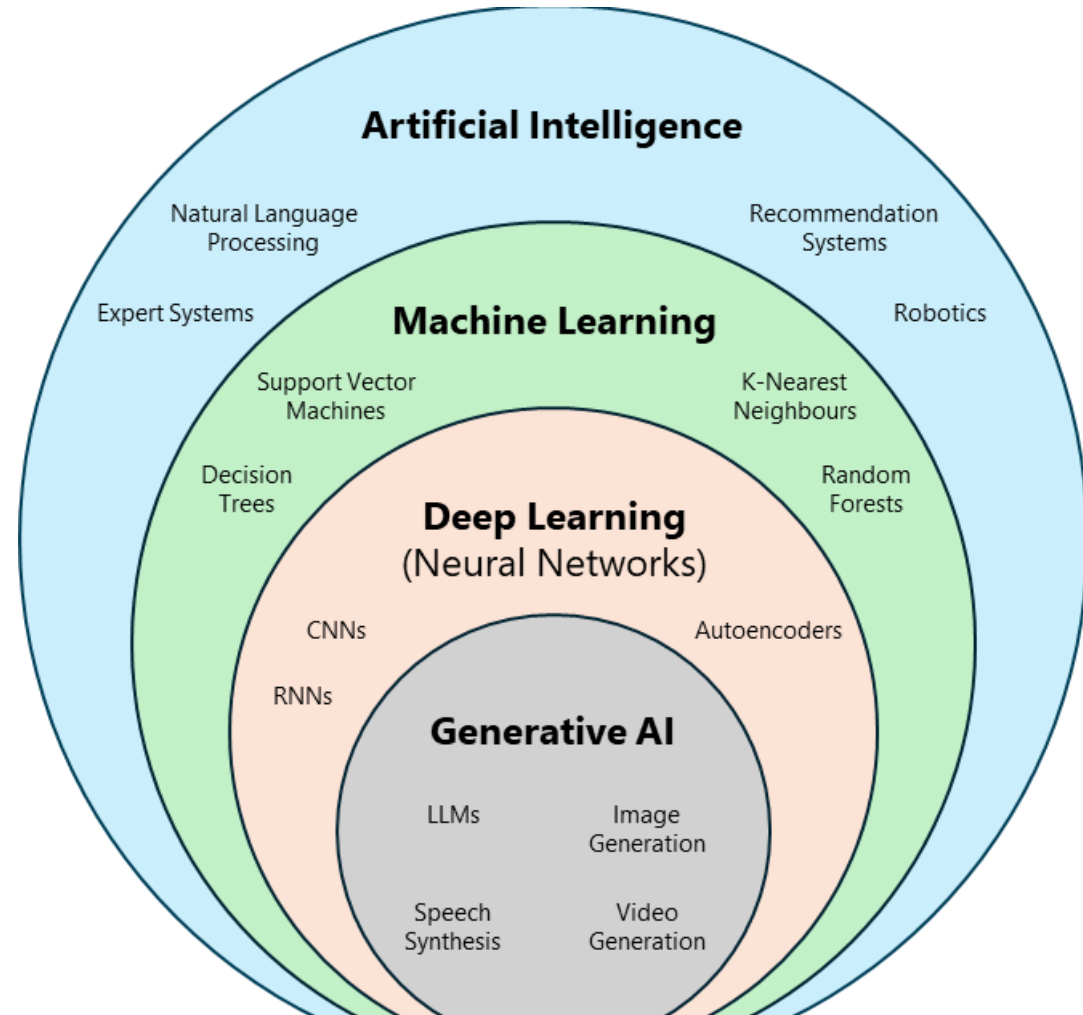
Legal and Ethical Risks & Considerations

Roadmap



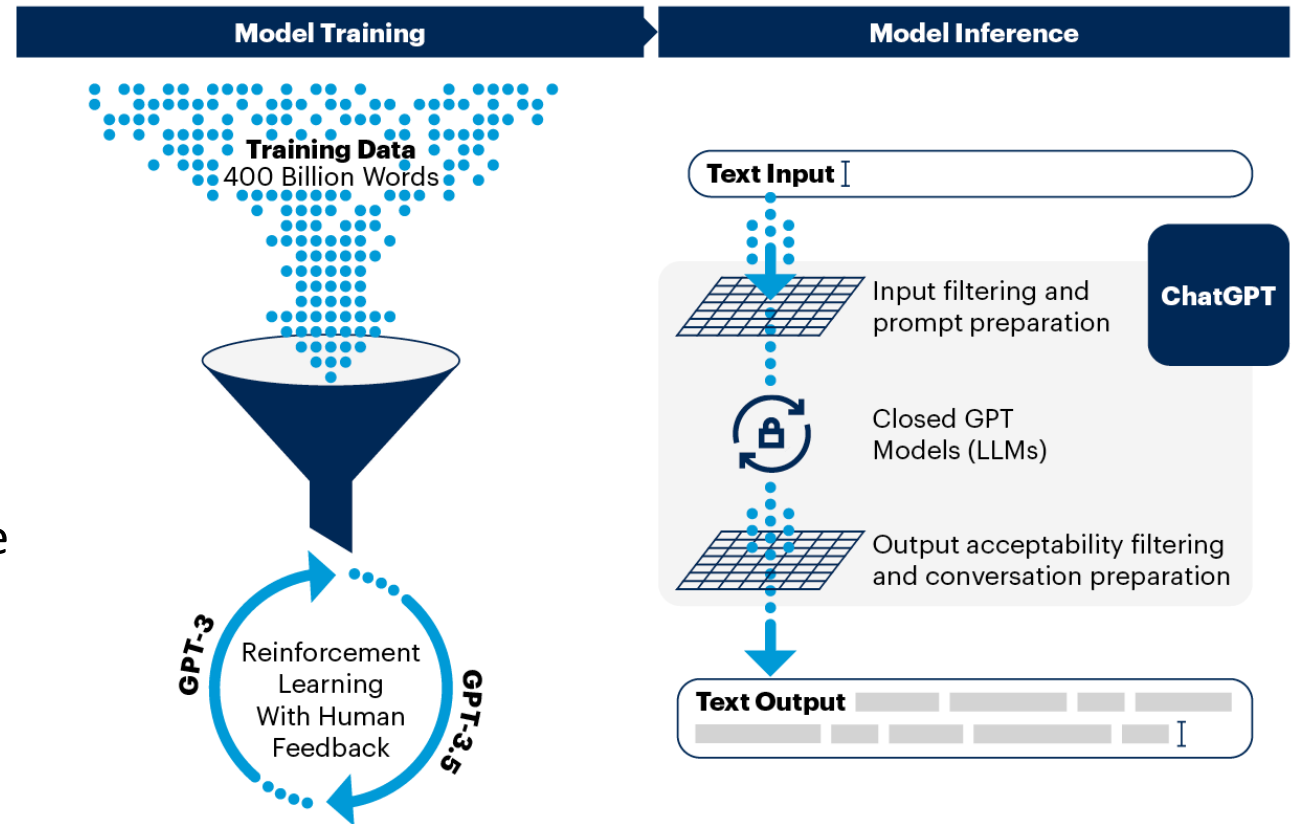
Overview

- What do we mean by “AI” today?
- Whole new set of acronyms
 - AI
 - GPT
 - ML
 - NLP
 - RL
 - ANN
- It’s everywhere
 - Google
 - Siri/Alexa
 - O365
 - Social Media
 - Netflix
 - ...



Privacy & Reliability

- Protected and/or sensitive information at risk
- Potential for inadvertent privacy breach
 - Nature of training AI models – **any** information entered may become part of their information set
 - Models pull from variety of sources – may be able to re-identify inadequately anonymized data
- Results can be flawed if content was inaccurate or simply because it is not true “understanding”



Source: Gartner, Inc.

Reliability & Accuracy

- Factual inaccuracies - Training data sets are not always current or correct
- “Hallucinations” – fabricated answers that might include legal or technical citations that don’t exist
- AI outputs are often received with a level of confidence that can be misleading
- Critical that users understand how systems are trained and limits of the output
- All generated product should be reviewed by a human and treated as “1st Draft”

Bias in AI

- AI Models are susceptible to biases introduced through
 - Training data
 - Programmed algorithms
 - Cognitive bias of the user
- AI outputs can inadvertently perpetuate or amplify intrinsic biases
 - **Healthcare**—Underrepresented data of women or minority groups resulted in systems returning lower accuracy results for black patients than white patients.
 - **Applicant tracking systems**—Amazon stopped using a hiring algorithm after finding it favored applicants based on words like “executed” or “captured,” which were more commonly found on men’s resumes.
 - **Predictive policing tools**—AI-powered predictive policing tools relying on historical arrest data, found to reinforce existing patterns of racial profiling and disproportionately target minority communities.

- IBM, *Shedding light on AI bias with real world examples*, October 16, 2023

Legal Risks - IP

- Intellectual Property:
 - Copyright infringements
 - Trademarks
- Pay attention to indemnification provisions and reps and warranties about training data

Your content. You may provide input to the Services (“Input”), and receive output from the Services based on the Input (“Output”). Input and Output are collectively “Content.” You are responsible for Content, including ensuring that it does not violate any applicable law or these Terms. You represent and warrant that you have all rights, licenses, and permissions needed to provide Input to our Services.

- ChatGPT Terms of Use (11/14/23)



Third-Party Risk – Ask Your Vendors . . .

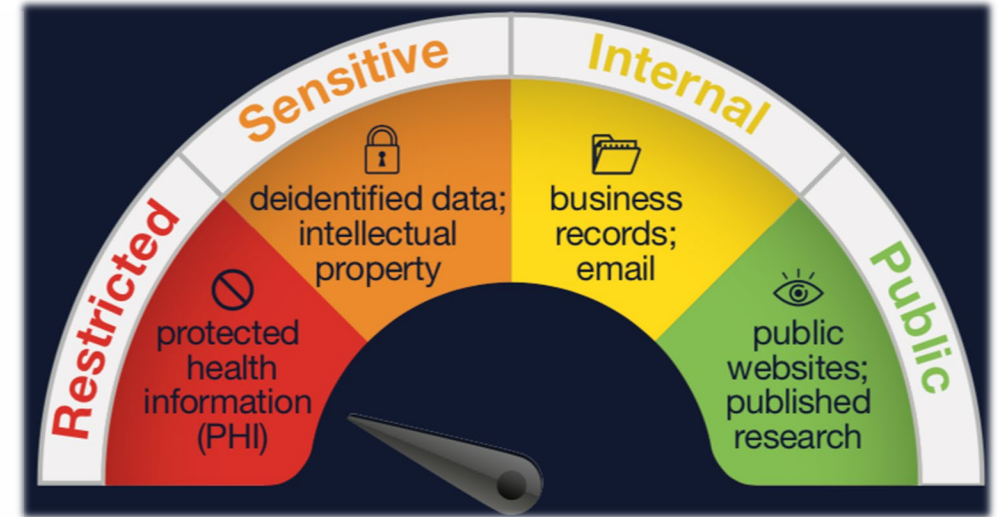
- Is AI integrated into the application?
 - For how long has it been integrated?
 - Is it deployed with other clients?
- How is the model trained?
 - Will my data be integrated, and will it be available to others?
- Are you tracking the model's accuracy rate?
- Are you evaluating the training data and model for bias?

Responsible Implementation

Example of Physical Data Flow Diagram
Mortgage Loan Application

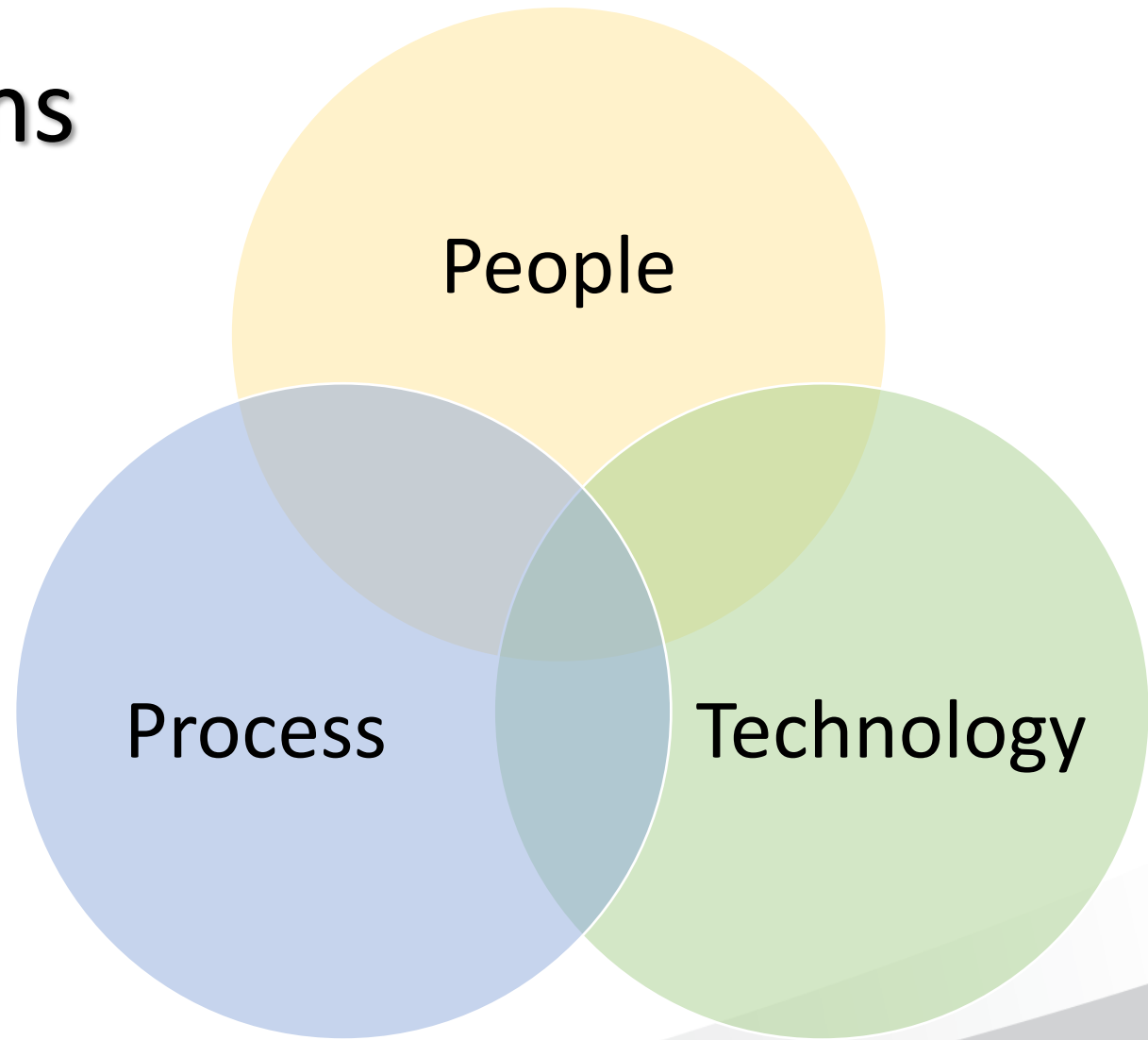
Understand your data – Inventory/Classification

- Who has it / can access it?
- What is it? – Protected – Sensitive – Public
- Where is it? – on premise, centralized, duplicate
- How does it flow? – staff, third-parties, securely
- Is your data “AI ready”



Consider the Options

- Include a diversity of interests in identifying use cases
- Use cases should demonstrate business value not just a tech deployment
- Generative AI is only one of many technology strategies



Cautious Innovation

- Permit Gen AI use under a formal Policy
- Treat all information entered as if you were posting on a public website
- Mandate employee review of all generated product
- Treat all products as '1st draft'
- Be transparent – disclose its use



Policy Development

MassHousing GenAI Policy highlights*:

- No AI products outside existing services
- No entry of protected, confidential, restricted data
- Must be transparent– include full attribution
- Must fact check and review all content
- Be mindful of bias
- Legal Division is policy owner
- Employees required to acknowledge



Questions?

