z/OS Performance Management in an AI World

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z/OS Performance
Education, Software, and
Managed Service Providers

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Abstract

z/OS Performance Management in an AI World

In an Artificial Intelligence (AI) world, many believe that z/OS Performance Management will change dramatically since the AI engines will help companies manage the performance of their environments. While AI will change the day-to-day z/OS performance management tasks, Actual Intelligence will be more necessary than ever. During this webinar, Peter Enrico will discuss growing need for Actual Intelligence while managing z/OS performance in an Artificial Intelligence (AI) world.

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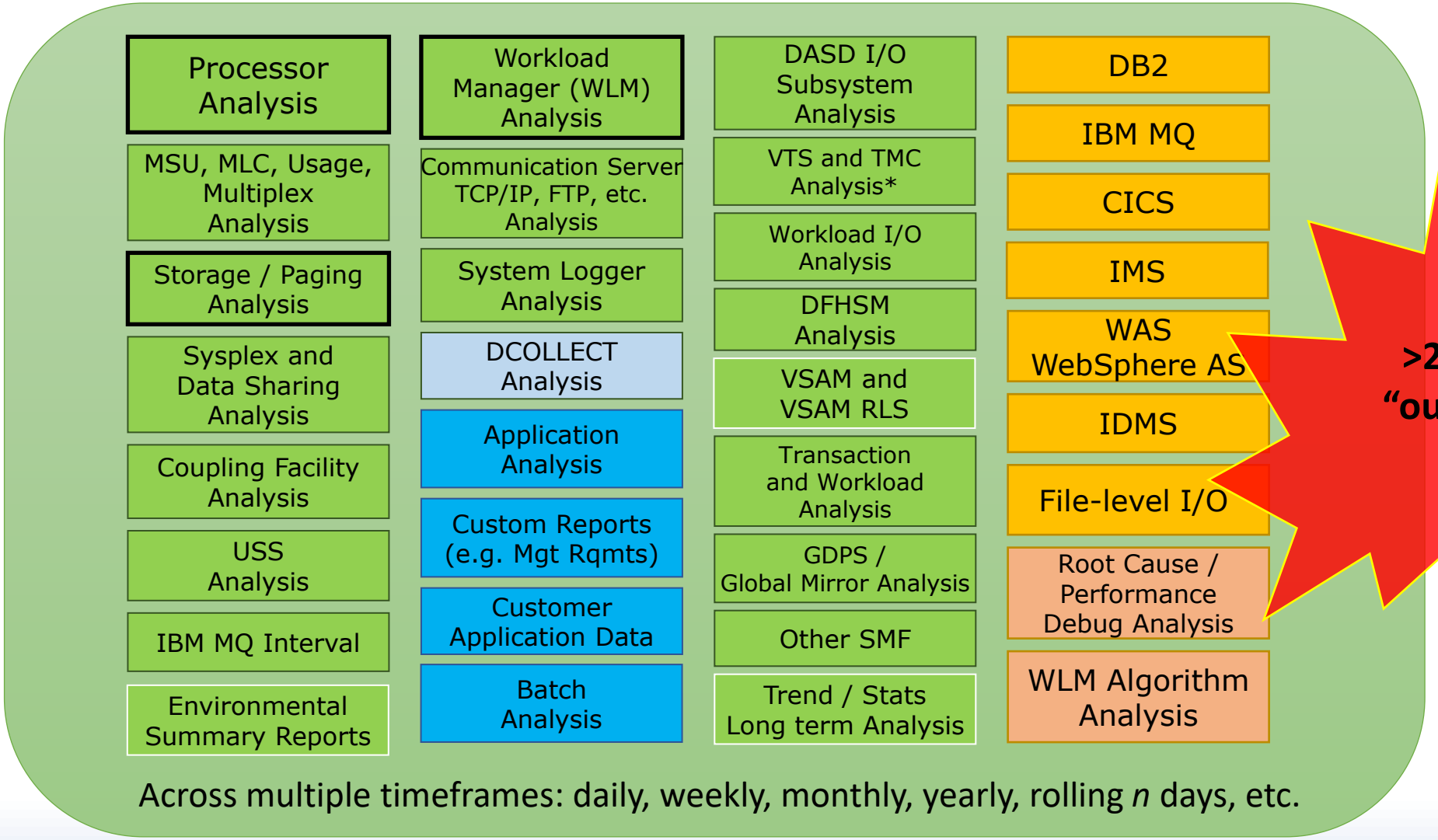

Like what you see?
Spring / Summer 2025 Webinars

- Free z/OS Performance Educational webinars!
  - The titles for our Spring / Summer 2025 webinars are as follows:
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    - ✓ *Back to basics - Processor Consumption Analysis*
    - ✓ *Pivotor Pointers*
    - ✓ *WLM and CPU Critical Control*
    - ✓ *Back to Basics - Evaluating Latent Demand*
    - ✓ *Understanding SMF 98 Locking Measurements*
    - ✓ *Standard Measurements when Monitoring Transactions*
    - ✓ *Overseeing z/OS Performance Management with Your Outsourcer*
    - ✓ *ETR vs ITR and the Basics of IBM's LSPR*
    - ✓ *Processor Comparison Discussion*
    - ✓ *SMF 99 WLM Decision Making Traces*
    - ✓ *Optimization in the Application Trenches*
    - ✓ *Understanding SMF 98 Address Space Consumption Measurements*
    - *z/OS Performance Management in an AI World*
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  - See also: http://pivotor.com/cursoryReview.html

Presentation Overview

- Note: A great deal of this presentation is an ‘organization of thought’
  - And me asking Google’s Gemini some simple questions
    (and you will see a bunch of references to copy/paste of the answers)

- Start at a very high level
  - What is actual intelligence (AI)?
  - What is artificial intelligence (AI)?
  - What is the purpose of artificial intelligence?

- What is, and what will be, the role of AI for z/OS performance management?
  - Overview of z/OS performance management
  - ‘Truths’ to help you distinguish the value of your skills against AI

What is AI?

- I asked the Google's Gemini AI Engine

- **Actual Intelligence**, also known as natural intelligence, is the cognitive ability inherent in biological organisms, especially humans, characterized by creativity, empathy, intuition, consciousness, and common-sense reasoning.

- **Artificial Intelligence** (AI) is the simulation of human intelligence in machines that are programmed to think and learn like humans, enabling them to perform tasks such as perception, problem-solving, reasoning, and decision-making.

- Artificial Intelligence is here, and now you must choose
  - Be a tool commanded by artificial intelligence
  - Be more than a tool, show real value, and use AI as just another tool in your toolkit

What are the key characteristics of AI?

(as per Google's Gemini)

AI = Actual Intelligence

- **Creativity**:
  - The ability to generate new and original ideas.
- **Empathy and Emotion**:
  - The capacity to understand and share feelings, which AI cannot replicate.
- **Intuition**:
  - A gut feeling or instant understanding not based on conscious reasoning.
- **Common Sense**:
  - Broad, practical knowledge of how the world works.
- **Consciousness**:
  - Self-awareness and the ability to experience subjective states.
- **Adaptability**:
  - The ability to adjust and respond to new and unpredictable situations.
- **Contextual Understanding**:
  - Deep integration of sensory input with experience and context to form meaningful perceptions.

AI = Artificial Intelligence

- **Data Processing**:
  - Can process and analyze vast amounts of data far faster than humans.
- **Pattern Recognition**:
  - Excellent at identifying patterns that may not be obvious to humans.
- **Repetitive Task Performance**:
  - Highly precise in handling repetitive tasks.
- **Lack of Understanding**:
  - Lacks the ability to truly understand the "why" or "how" behind data.
- **Rule-Based or Statistical**:
  - Operates on rule-based systems or complex statistical algorithms, not true thought or sentience.
- **Narrow Focus**:
  - AI is typically designed for specific, well-defined tasks rather than broad, general intelligence.

What are the key purposes of AI?

(as per Google's Gemini)

AI = Actual Intelligence

- **Adaptation:**
  - Actual intelligence enables living beings to learn from experience and adapt to new and changing circumstances. This is a fundamental skill for surviving and thriving in a given environment.
- **Problem-solving:**
  - core function of intelligence is the ability to solve complex problems and overcome challenges. It allows living organisms to analyze a variety of issues and find workable solutions.
- **Logical reasoning:**
  - The capacity for logic, reasoning, and abstract thought is a key part of actual intelligence. It allows for the comprehension of complex ideas and the deduction of new properties from existing knowledge.
- **Decision-making:**
  - In the evolutionary sense, intelligence allows an individual to make decisions with outcomes that benefit them. This improves the chances of survival and reproduction.

AI = Artificial Intelligence

- **Automation of Tasks:**
  - AI can automate repetitive, routine, or computationally intensive tasks, freeing up human resources to focus on more complex and creative work.
- **Human-like Intelligence:**
  - AI systems are designed to learn from data, adapt to new information, and perform human-like functions, including understanding natural language and making decisions.
- **Problem-Solving:**
  - AI can tackle complex challenges by processing vast amounts of data and identifying patterns that might be missed by humans, leading to more informed solutions.
- **Decision Support:**
  - AI provides human-like interaction and decision support, offering insights and analyses to help people make more effective choices in various fields.
- **Innovation:**
  - By enhancing efficiency and enabling new capabilities, AI serves as a foundation for groundbreaking advancements and helps address societal challenges.

OK… so we know the definitions and the purposes…

But businesses do not invest in the development of a new technology just to be leading edge. No offense, but businesses tend not to be very altruistic. Money, power, and profit are usually the motivating factors.

(Once we gain insights into their motivation, we can then think our futures working in the field of z/OS Performance Management and Capacity Planning.)

What is driving the development of Artificial Intelligence?

- When I thought of this question, at first such answers popped into my head:
  - The betterment of mankind
  - Make the lives of employees easier
  - Help to increase skill level and productivity
  - Open the way towards new areas of technology

- I asked the Gemini engine the business motivation for AI, and got the following list:
  - Enhanced efficiency
  - Competitive advantage
  - Improve human lives
  - Achieve goals more effectively across various sectors
  - Automation of Tasks
  - Innovation
  - Etc..

Why Gemini thinks companies are developing artificial intelligence solutions

- Economic and Competitive Drivers
  - Market Growth and Competitive Edge:
    - Businesses are investing in AI to gain an advantage over competitors by improving products, optimizing operations, and enabling strategic, data-driven decisions.
  - Profit and Cost Savings:
    - AI can reduce labor costs through automation and lead to significant cost savings by optimizing processes and preventing costly downtime in manufacturing.
  - Innovation and Idea Generation:
    - AI tools can assist in generating new ideas and identifying trends, supporting research and development (R&D) to create better products that fit market needs.

Why Gemini thinks companies are developing artificial intelligence solutions

- Technological and Data Enablers
  - Data Availability:
    - The rise of cloud-based storage provides access to massive datasets, which are crucial for training AI models to improve their accuracy and efficiency.
  - Accessible AI Platforms:
    - The growing availability of AI platforms and tools has lowered the barrier to entry for organizations, enabling more companies to develop and implement AI solutions.
  - Advancements in Machine Learning:
    - Machine learning, a subset of AI, allows systems to learn and improve from experience, requiring vast amounts of data to become more precise and effective.

Why Gemini thinks companies are developing artificial intelligence solutions

- Societal and Human Benefits
  - Task Automation:
    - AI can automate repetitive or complex tasks, freeing up humans to focus on more critical and creative work.
  - Improved Efficiency:
    - AI helps in achieving goals more efficiently, whether in diagnosis, traffic management, or optimizing resource allocation.
  - Better Customer Experiences:
    - By analyzing customer data, AI enables companies to understand needs and provide personalized services and support, increasing customer retention.

Peter Enrico's cynical belief

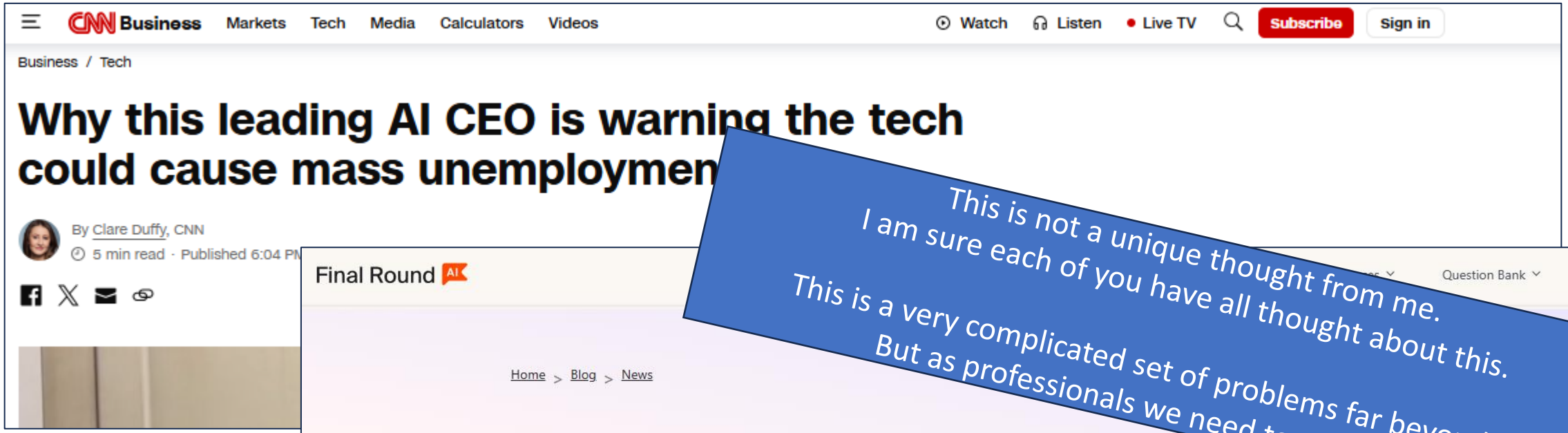
- Call me cynical, but I am not sure the business entities developing and pushing AI technologies have the best interests of the world, and us workers, as their primary concern

- The best explanation that I found for the business push to AI is as follows
  - And this is the harsh AI reality that I strongly suggest we all must prepare for

The underlying purpose of AI is to allow wealth to access skill while removing from the skilled the ability to access wealth.

(source Unknown)

Implications of AI on Lifelong Careers



This is not a unique thought from me.
I am sure each of you have all thought about this.

This is a very complicated set of problems far beyond me.
But as professionals we need to consider it.

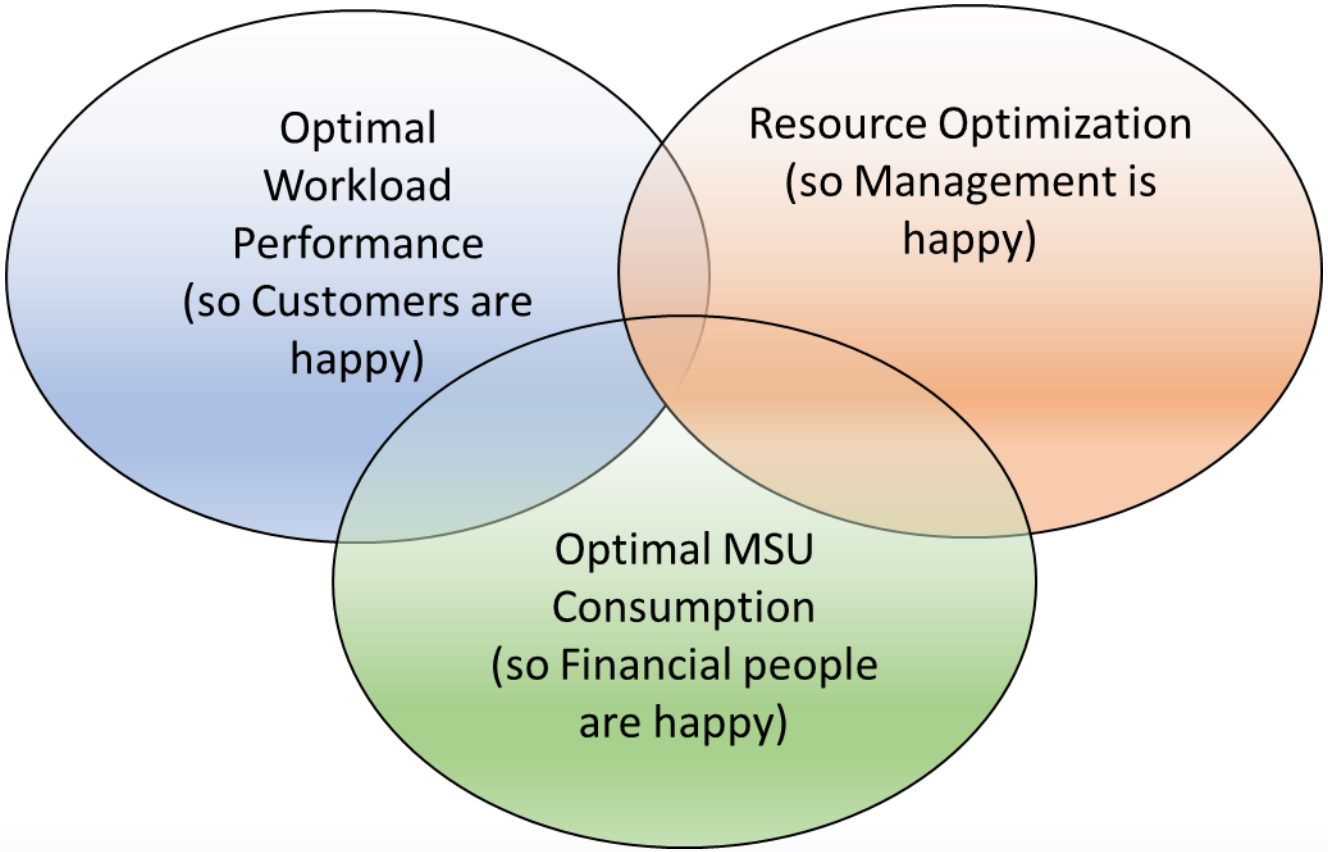
My question…

Assuming both Actual Intelligence and Artificial Intelligence are both here to stay long term, then in the world of z/OS performance management, what does a synergistic relationship look like between artificial and actual intelligence?

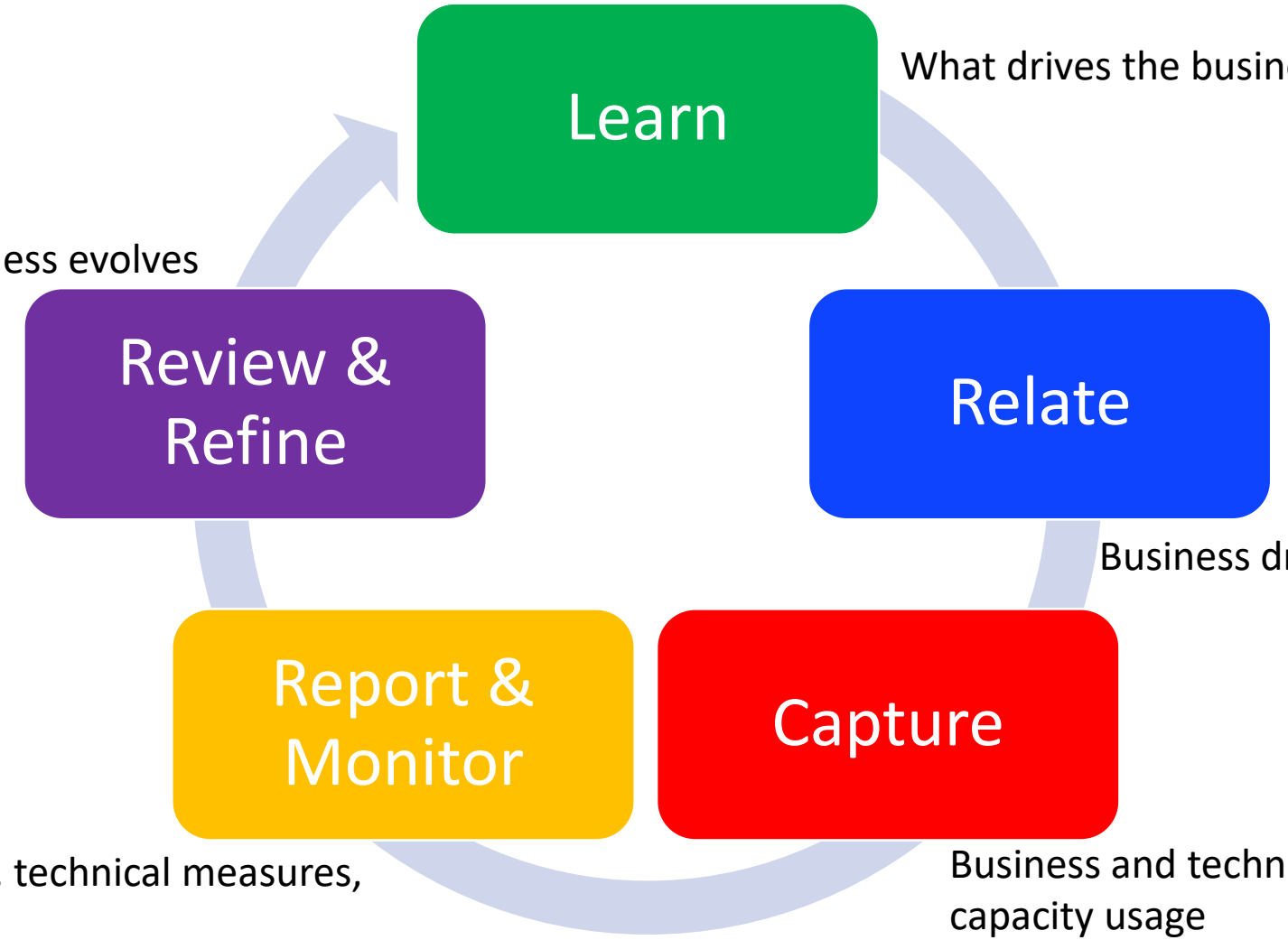
(In other words, how do we align our human performance management skills in an artificial intelligence world?)

The Performance Balancing Act

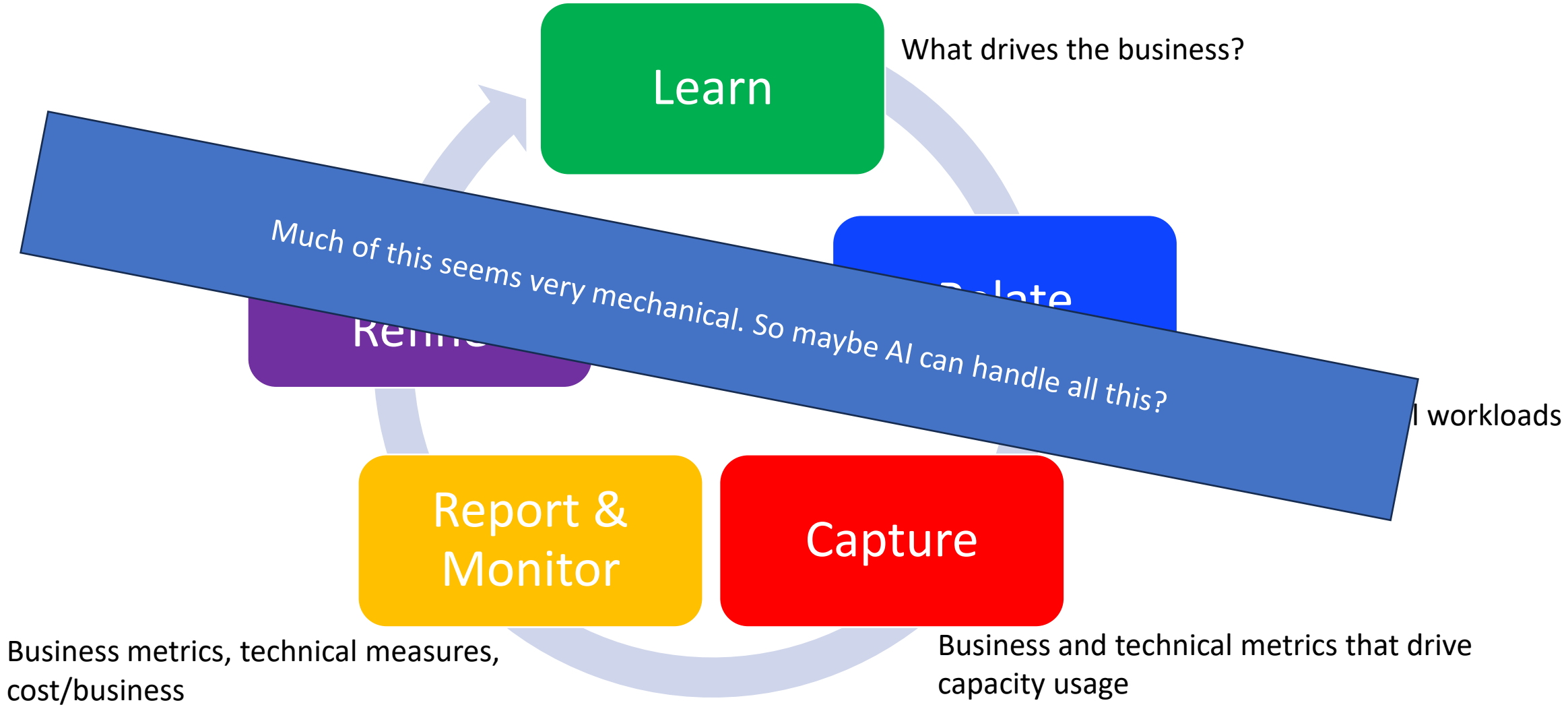
- Performance on z/OS is about finding an optimal balance among 3 areas
  - And dealing with latent demand is no different than any other performance issue



Performance and Capacity Management



Performance and Capacity Management



One quick disclosure…

- Pivotor does **not** use Artificial Intelligence
  - For our outlier support, we do a simple form of machine learning based on statistical methodologies
- We absolutely do not generative AI, or any AI
- We absolutely do not feed customer data into AI engines to train data
- There are zero security issues here.
  - We are super conscientious of security
- EPS, along with using Pivotor, know that analysis is customer unique
  - Different systems, different environments, different business needs all need to be considered

Truth 1:
z/OS performance management Careers

- A solid z/OS performance analyst continues to learn and understand
  - To me it does not seem far fetched 10 to 15 years from now a performance analyst depending too much on AI will even know what CPU Utilization fully means, how it is calculated, and all the associated deeper concepts

- Recommendation:
  - Continue to learn about your environment and resources, and how to optimize them
  - Continue to learn about your workloads and how to optimize them
  - Continue to learn about your customers, your business needs, etc.
  - Continue to maintain situational awareness
    - Do not just become another part of the machinery
    - Always show and prove value

Truth 2:
z/OS performance management Careers

- A solid z/OS performance analyst gains a deep contextual understanding of the environment, business objectives, trends and constraints.
  - Such contextual understandings help us to interpret complex performance measurements and make decisions that align with broader company goals.

- Recommendation:
  - Keep on top of your understanding of the entire environment
  - Make sure you know the business objectives, so you know when you need to edit or reject AI decisions that may not align with the business
  - Keep on top of company's business trends, as well as workload trends
  - Understand not just resource constraints, but business constraints and implications

Truth 3:
z/OS performance management Careers

- A solid z/OS performance analyst is enabled for complex problem-solving that requires intuition, creativity and situational awareness
  - An artificial intelligent solution can gain a form of situational awareness based solely on data.
  - But any creative solutions are probably really a mechanical solution just based on data
    - Example: IBM's current big z/OS AI tout is AI for WLM batch initiators (yawn)
  - Any such solutions still need to be verified by a human before implementation

- Recommendation:
  - Continue to gain a wealth of subjective experience in your industry and performance
  - Learn to trust your intuition even if it conflicts with AI decisions
  - Learn to be creative, because sometimes creative solutions and decisions are needed

Truth 4:
z/OS performance management Careers

- A solid z/OS performance analyst can make decisions based on judgment and experience.
  - There are many real-world considerations and constraints that cannot—and should not—be parameterized into AI engines
  - AI is good at spotting difficult to detect trends causing an issue

- Recommendation:
  - Stay in the real world, and make sure your management knows you are still in the real world and not just blindly accepting AI decisions
  - Learn to trust your judgement and take action to pre-empt AI decisions when your real-world judgement says otherwise.

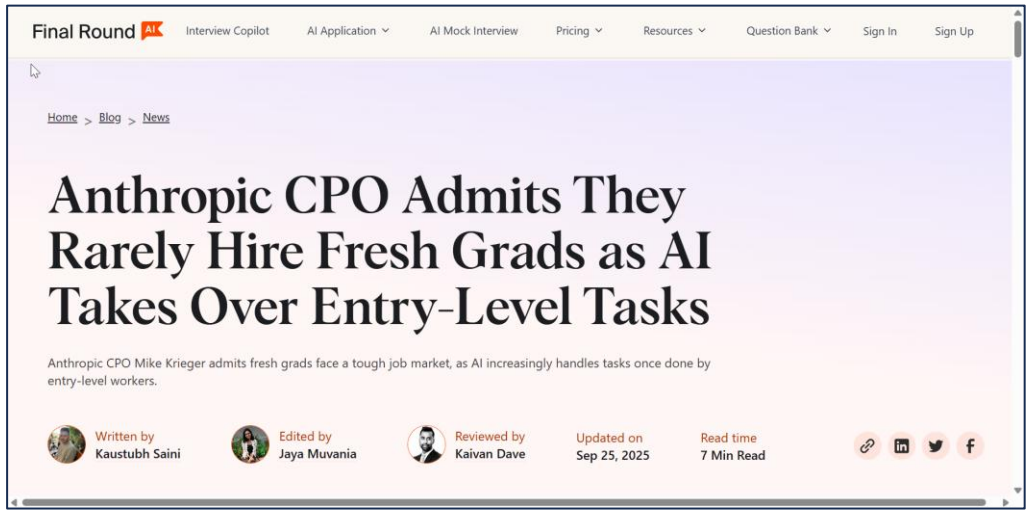
Truth 5:
z/OS performance management Careers

- A solid z/OS performance analyst has real-world experience, which allows analysts to help identify and debug both subtle and complex problems.

- Recommendation:
  - Do not stop learning.
  - Until the AI technology greatly matures, do not just continually ask AI engines for recommendations or courses of action
  - Real-world experience will allow you to better debug subtle problems
  - Continue to think for yourself

Truth 6:
z/OS performance management Careers

- A solid z/OS performance analyst has the ability to collaborate and share ideas.
  - Humans can learn from their colleagues who specialize in other areas.
  - Remember, many solutions need many different view-points, and not just a mechanical look a subset of trained data



- Recommendation:
  - Learn from your colleagues
  - Mentor younger z/OS performance analysts in training
  - Collaborate with real discussions instead of just typing questions to an AI engine
  - Work with junior team members, and help them to learn and think for themselves

Truth 7:
z/OS performance management Careers

- A solid z/OS performance analyst understands the broader implications of recommendations and changes.
  - Humans are more adaptive to changes in business and world events, so we can act depending on what is technically best and optimal for the business.

- Recommendation:
  - Changes to business, geo-political situations, financial situations, etc. are probably better understood by humans
  - Be like Matthew Broderick's character in War Games
    - Don't trust Joshua

Warnings that should be heeded

- Companies are jumping the gun and using AI instead of hiring fresh grads or interns. In addition, they are trying to keep senior engineers based on their experience.
  - What will happen to skill levels and deeper understandings if these trends continue?

- I think AI will be like the world wide web when it first was introduced
  - In the beginning it I fun to play with it. It was like living in the wild west
  - Now look at the societal problems WWW as contributed to

- I am curious as the future of tort claims
  - Are AI solutions blameless? Can an AI decision be sued? Can AI be fired?
  - Businesses and management may want to blame AI decisions, but in the end, they will may blame you

Conclusion

- The ramifications of AI will be severe, broad, pervasive, annoying, and (at times) very scary
- It is important to exercise temperance and to not buy into all the marketing hype just yet
  - Some of the hype is just hype, but keep a keen eye as you approach and live in this new world
- Remember, it is natural for businesses answer first to stockholders and usually less to employees
  - And remember business developing AI technologies are not doing it for the good of mankind. It is always about profit
- The Z enterprise computer performance management is still an extremely viable career for the foreseeable future.
  - Make sure you treat, and consider, your skills as an asset. Your education will always be a sound investment
  - Not only that, but despite the rise and hype of artificial intelligence, the actual intelligence of the human workforce in IT will continue to be invaluable. Management will learn this.
  - Do not allow yourself to be turning into the maintenance guy that uses the oil can to maintain the AI
- Recommendation:
  - Learn to use Artificial Intelligence as a tool to help you enhance your job, but make sure management know that there are risks if they think they can let Artificial Intelligence replace your jobs.