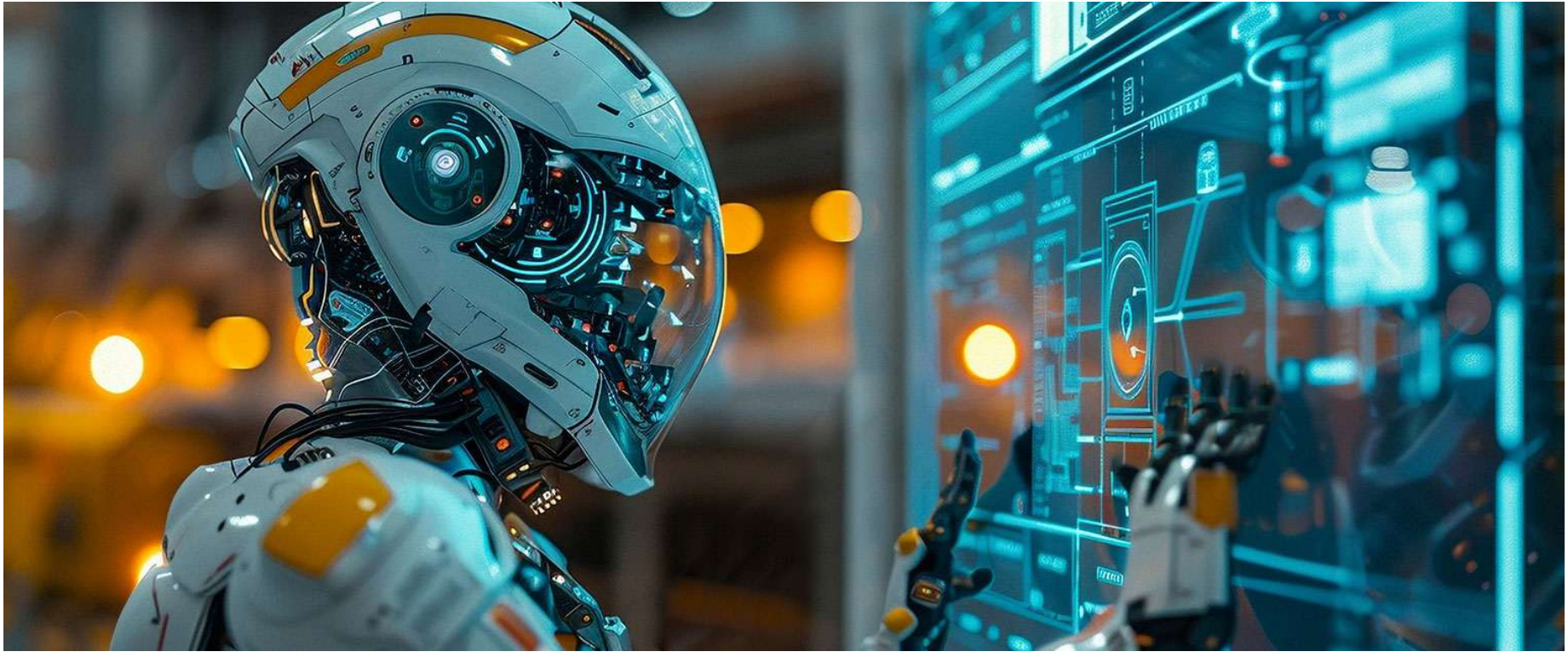
IN THE NAME OF ALLAH

THE MOST BENEFICENT, THE MOST MERCIFUL

# Introduction To Generative AI

## Harnessing the Power of AI to Drive Innovation and Growth



# Sequence of Presentation

- What is Generative AI ?
- Key Technologies
- Breakthroughs
- Applications
- Tools
- Prompt Engineering
- Resources
- Data Privacy & Security
- Emerging Trends
- Opportunities in Pakistan
- Final Thoughts

# What is Generative AI ?

- Generative AI refers to a subset of AI that can create new, original content - text, images, music, code - based on patterns learned from existing data

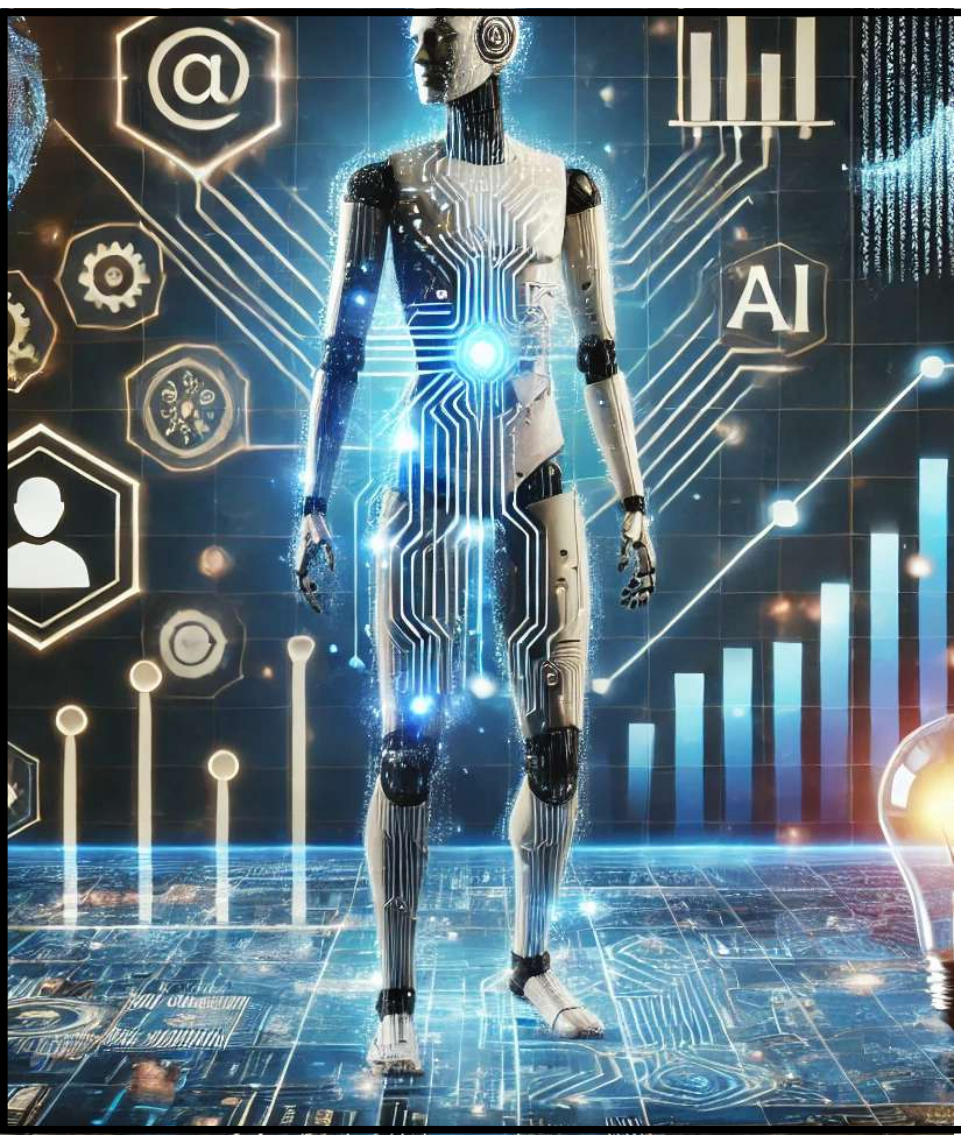
- Traditional AI: Focus on analyzing and interpreting existing data
- Generative AI: Produce new outputs mimicking human creativity

# What is Generative AI ?

- Importance in Technological Landscape
  - Automating Creative Processes & Generating Human-Like Content at Scale
  - Enhance Productivity, Creativity, & Problem-Solving across Multiple Sectors

# What is Generative AI ?

- Generative AI focuses on models capable of producing original content: text, images, code, audio, and even physical or molecular designs.
- These models learn statistical patterns in massive datasets and then sample from those distributions to generate plausible outputs.




# What is Generative AI ?

- It is important to understand that generative models do not “copy”; they generate novel combinations based on learned patterns.
- This has profound implications for creativity, scientific discovery, automation, and computational modeling.

# Key Technologies in Generative AI

- **GPT, or Generative Pre-trained Transformer:** A language model that can generate human-like text
- **ChatGPT:** Content Creation, Coding, etc.
- **DALL-E:** AI System that can create images from textual descriptions, showcasing the potential of AI in visual arts

# Key Technologies in Generative AI

- Other Notable Technologies:
  - Stable Diffusion for image generation
  - Midjourney for creating art from text prompts

# Recent Breakthroughs in Generative AI

- **Advancements in Natural Language Processing (NLP):** Significant improvements in NLP, allowing for more coherent & context-aware text generation

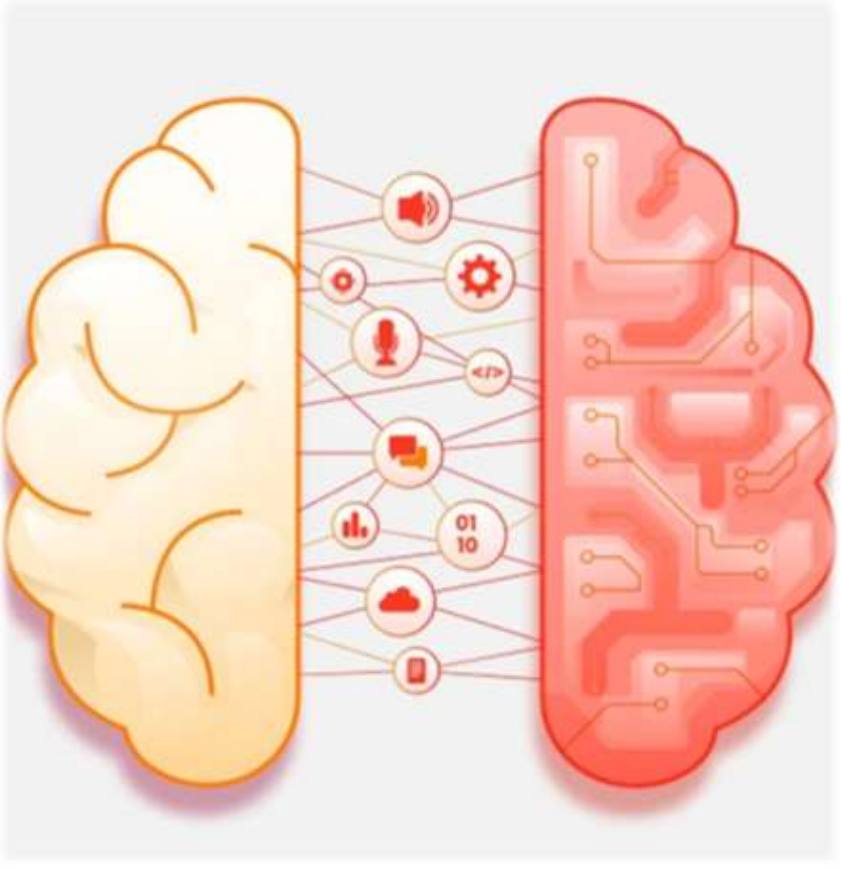
- **Improvements in Image & Video Generation:** Creating photorealistic images & short videos from text descriptions

# Recent Breakthroughs in Generative AI

- **Multimodal AI Systems:** Work with different types of data (text, images, audio) simultaneously

# Applications Across Industries

- Healthcare: Drug Discovery & Analyzing Medical Images
- Creative Industries: Content Creation, Design, & Music Composition
- Business: Customer Service Chatbots & Advanced Data Analysis
- Education:
  - Personalized Learning Experiences
  - Content Generation for Courses



# Industry Impact of Generative AI

- Marketing & Advertising: content creation and personalized customer engagement
- Finance & Banking: Investment strategies and customer services

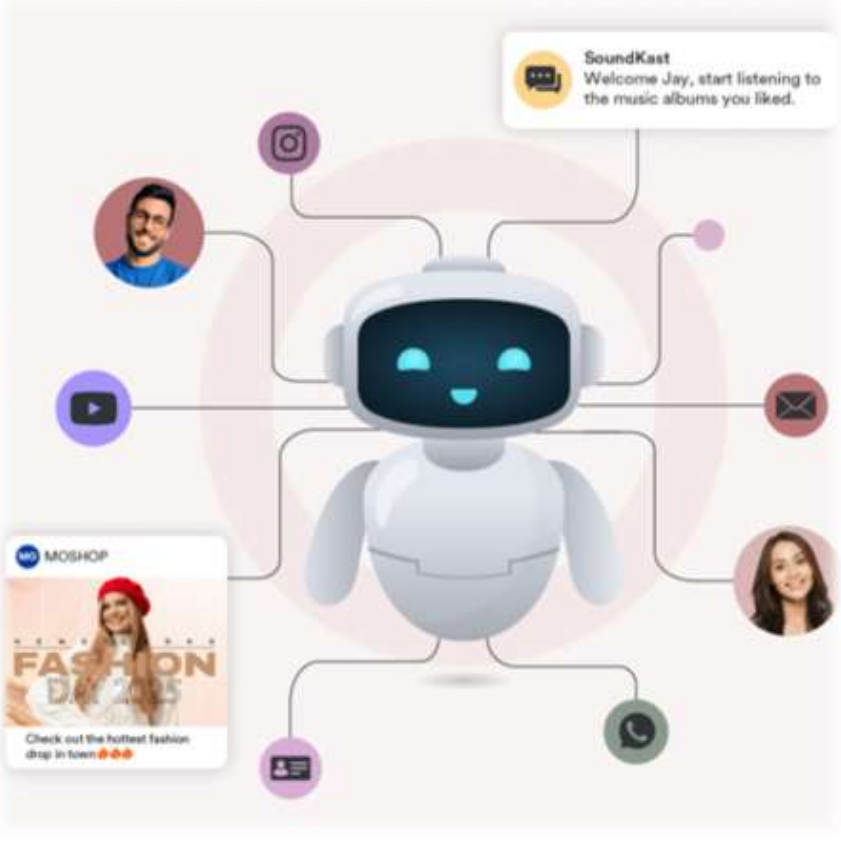
# Industry Impact of Generative AI

- Healthcare & Pharmaceuticals:
  - Accelerate drug discovery
  - Improve clinical trials
  - Enable Personalized treatment plans

- Manufacturing & Technology: Enhance Manufacturing Processes through Predictive Maintenance & Quality Control

# Tailored Use Cases

- Automation of Routine Tasks, Freeing up employees for more strategic work
- Enhanced Decision Support Systems: AI analyzes vast amounts of data to provide insights, improving strategic planning and risk prediction
- Improved Customer Engagement: Personalized interactions & AI-powered chatbots



# Tailored Use Cases

- Productivity Boost across Functions
- McKinsey Estimate: Generative AI could add $2.6 trillion to $4.4 trillion annually across 63 analyzed use cases
- Software Industry: Code generation & debugging, Speeding up the development process

# Global Success Stories

- Coca-Cola: Use AI to create innovative marketing campaigns
- JPMorgan Chase: Contract analysis and risk management
- DeepMind: Breakthrough in protein folding, which has enormous potential for drug discovery & understanding diseases

# Local AI Success Stories

- Systems Limited: Develop AI-powered solutions for various industries, including a chatbot for a major telecom company that improved customer service efficiency

# Local AI Success Stories

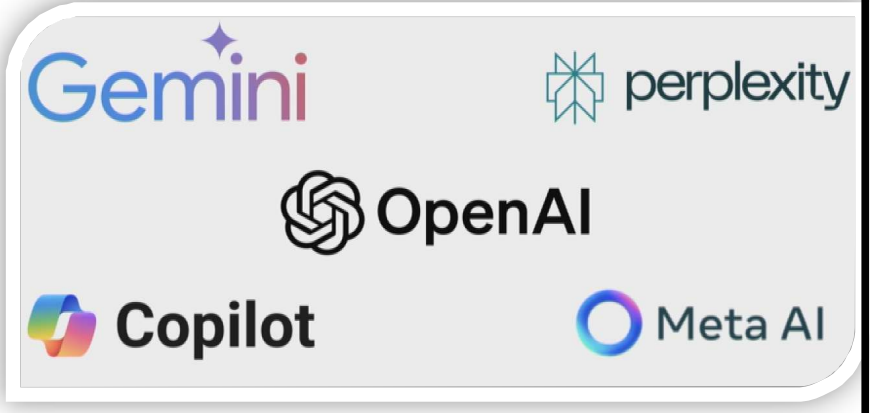
- Afiniti: Use AI for behavioral pairing in call centers, significantly improving customer satisfaction and sales for global clients

- Folio3: Develop AI applications for crop monitoring and yield prediction, helping farmers make data-driven decisions

# Overview of Accessible AI Tools

OpenAI Provides Powerful Language Models

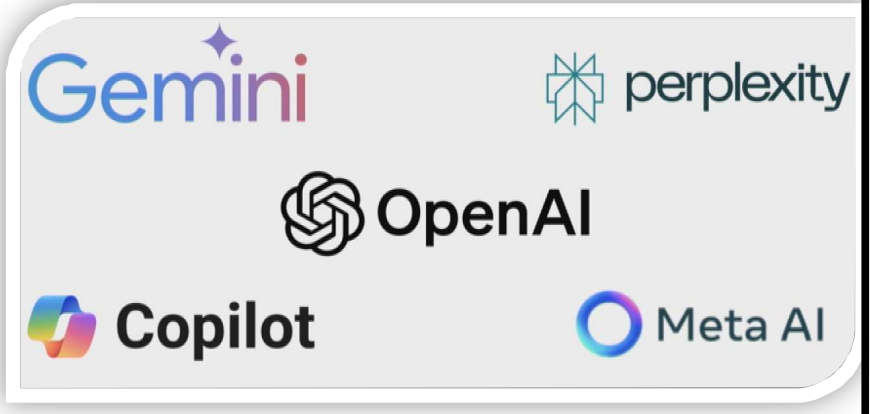
- GPT-4: Text Generation & Analysis
- DALL-E: Image Creation



# Overview of Accessible AI Tools

Google Gemini:

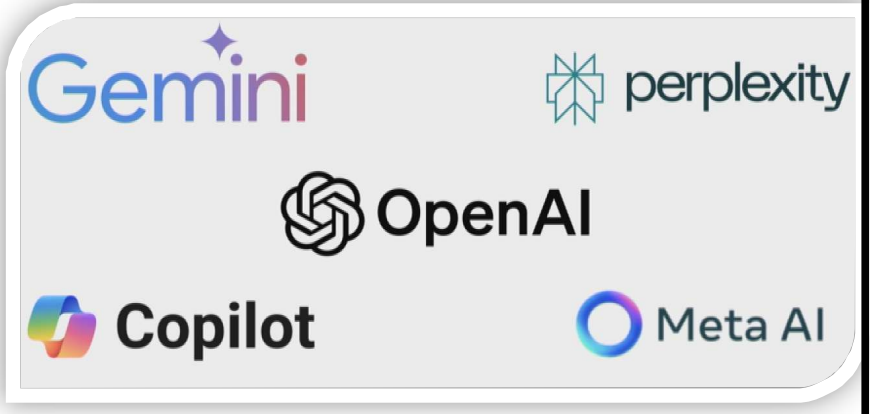
- Next Generation of Multimodal AI
- Capable of Understanding & Generating text, images, & code simultaneously
- Ideal for complex business applications that require processing multiple types of data



# Overview of Accessible AI Tools

Microsoft Copilot:

- AI-powered assistance across various Productivity Tools, enhancing tasks like document creation, data analysis in Excel, & presentation design in PowerPoint
- Democratize AI technology, allowing businesses to leverage advanced capabilities without extensive technical expertise



# AI Opportunities in Key Business Areas

- Customer Service & Engagement: Enhance Engagement through Chatbots, Personalized Recommendations, & Predictive Support

- Operations & Supply Chain: Demand forecasting, inventory optimization, & predictive maintenance

# AI Opportunities in Key Business Areas

- Product Development & Innovation: Accelerate innovation through data-driven insights and automated testing
- Marketing and Sales: AI-powered customer segmentation, campaign optimization, and sales forecasting

# AI Opportunities in Key Business Areas

- Human Resources & Talent Management: Streamline recruitment processes, enhance employee training, & predict turnover

# Best Practices for Prompt Engineering

- Be clear and specific in your instructions
- Provide context and background information
- Use examples to guide AI responses
- Break complex tasks into smaller steps
- Iterate & refine prompts for optimal results
- Consider AI model's capabilities & limitations

# Resources for AI Implementation

- Pre-built AI Models:
  - OpenAI GPT Models: NLP Tasks
  - Google Gemini: Powerful Language Understanding Capabilities
  - Hugging Face Model Hub: Wide Range of Pre-Trained Models for Various Tasks

# Resources for AI Implementation

- APIs and Integration Tools:
  - OpenAI API: Incorporate Powerful Language Models into your Applications with just a Few Lines of Code
  - Google Cloud AI & Microsoft Azure Cognitive Services: Suite of AI Tools that can be easily Integrated into your Existing Systems

# Resources for AI Implementation

- Frameworks to develop custom AI solutions:
  - TensorFlow
  - PyTorch
  - FastAI

- Learning Resources to build AI skills:
  - Online courses (Coursera, edX, Udacity)
  - AI documentation and tutorials
  - Community forums and discussion groups

# Navigating Data Privacy & Security Concerns

- Data collection & consent: Ensuring that all data collection is done with proper consent, clearly communicating to users how their data will be used in AI systems

- Data anonymization techniques to protect individual identities while maintaining data utility

# Navigating Data Privacy & Security Concerns

- Access control measures & user authentication to prevent unauthorized access to sensitive data
- Transparency in AI Data Usage: Be transparent about how AI systems use data, providing clear explanations to users and stakeholders

# Emerging Trends in Generative AI

- AI-human Collaboration Models: Emergence of advanced AI-human collaboration models, where AI augments human capabilities rather than replacing them
- Quantum computing and AI: Quantum computing holds the potential to dramatically accelerate AI processing power, potentially leading to breakthroughs in complex problem-solving

# Emerging Trends in Generative AI

- Explainable AI: Make AI decision-making processes more transparent & understandable

- Edge AI & Decentralized Learning: Pushing AI capabilities to individual devices, enhancing privacy & reducing reliance on central servers

# Emerging Trends in Generative AI

- Ethical & Responsible AI Development: Ensure that as AI becomes more powerful, it remains aligned with human values and societal needs

# AI-Driven Growth Opportunities in Pakistan

- Agriculture tech and smart farming: Revolutionize farming practices through smart irrigation systems, crop disease detection, & yield prediction models

- Healthcare accessibility and telemedicine: Improving access to quality healthcare in remote areas, and enhancing diagnostic accuracy

# AI-Driven Growth Opportunities in Pakistan

- Fintech and Financial Inclusion: Offer services to the unbanked population and optimize risk assessment for loans

# AI-Driven Growth Opportunities in Pakistan

- Education technology powered by AI: Provide personalized learning experiences, addressing the diverse educational needs across the country

- E-commerce and supply chain optimization: Improve logistics and customer experiences in Pakistan's growing digital marketplace

# AI-Driven Growth Opportunities in Pakistan

- Managing renewable energy sources and optimizing power distribution, addressing Pakistan's energy challenges

- Smart city initiatives and urban planning: Improving urban planning, traffic management, and public services in Pakistan's rapidly growing cities

# GIKI Collaboration with Capital Smart City

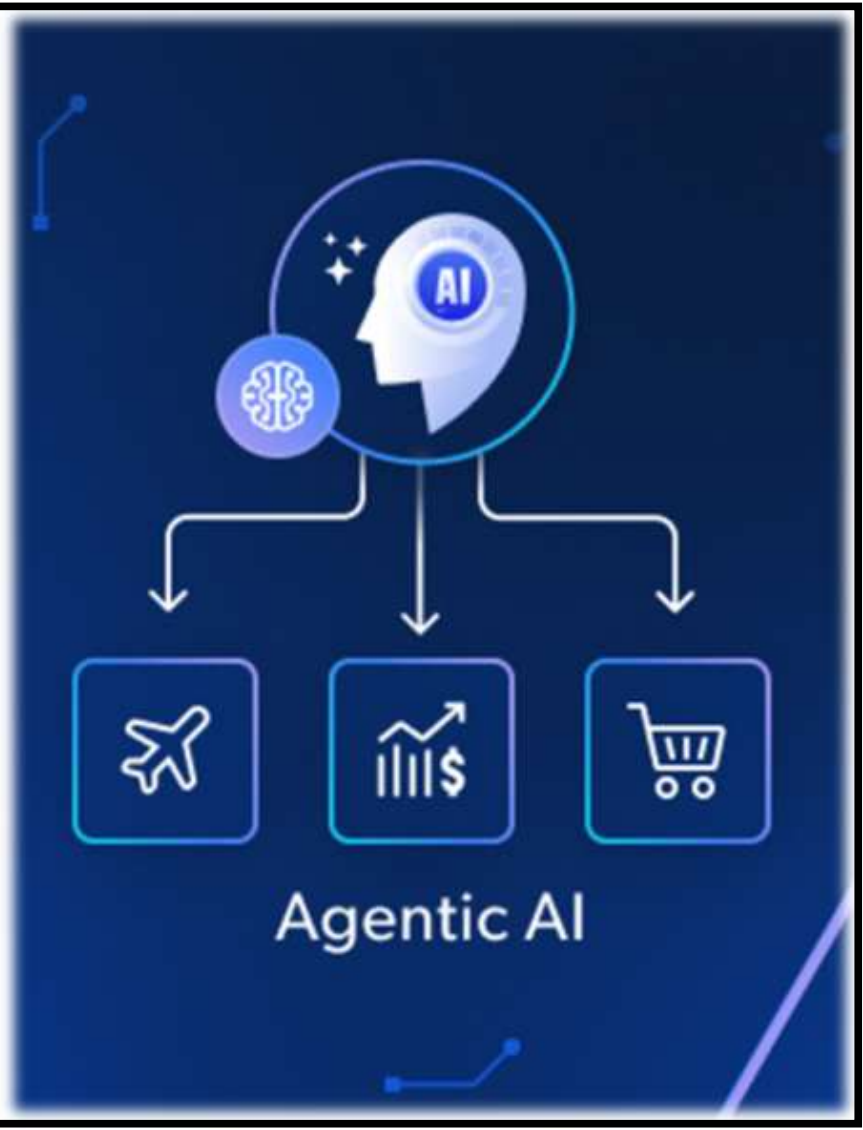
- Establishment of Center of Excellence in Artificial Intelligence (AI) and Data Science (DS) at Silicon Village of Capital Smart City in Islamabad

- Capital Smart City is a new eco-friendly destination with an exclusive designated interchange on motorway (M2)

- Pakistan's first ever smart city and a model for sustainable development

# Agentic AI

- Next Phase of Gen-AI
- Models that can Autonomously Plan, Act, and Interact with Digital Environments



# Final Thoughts

- Generative AI Marks a Fundamental Shift from Analytical Computation to Creative Computation
- Generative AI Enhances Productivity
- Industry Impact of Generative AI
- AI Opportunities in Key Business Areas
- Data Security & Ethical Considerations

# THANK YOU !