AI talent – what is it? V2

What is the purpose of this article?
This article enables business leaders to begin a discussion of what is AI and the value talent.

The audience for this article includes: the board of directors, C-Suite, and investors.

This article does not provide tax, legal or financial advice.
You must do your own research and fact-based analysis using current and relevant information.

What are the critical learnings in this article?
1) Generative AI is software which creates content, such as text, that has never existed before.
2) ChatGPT-4 doesn't "understand" text in the human sense. It's predicting text based on patterns it learned during training.
3) Directions and questions to ChatGPT-4 are transformed into floating-point numbers, then analyzed using a large database of floating-point numbers. The result of the analysis are floating-point numbers which are then turned into text.
4) Fundamentally, ChatGPT-4 can be viewed as an advanced form of a word predictor, but it's a highly sophisticated one. ChatGPT-4 doesn't "understand" text in the human sense. It's predicting text based on patterns it learned during training.
5) Scientists are sill experimenting with, and trying to predict and explain, the advanced capabilities of Generative AI.

What was the approach used to create this article?
I asked ChatGPT-4 Plus Turbo questions in December 2023 and January, February, May 2024. I summarized the answers in this article.

The scope of this article is ChatGPT-'s abilities with text questions and text answers. I recognize that in May2024, a variety of AIs are also able to create: voice, song, image, video, spreadsheets, PowerPoint presentations, word documents, etc.

What is AI?
AI is software which simulates human intelligence, with behaviours such as learning and problem solving

How many types of AI are there?
There are two types of AI:
1) Narrow or weak: These are designed and trained for a specific task such as a virtual assistant.
2) General or strong AI: These have the ability to perform any intellectual task a human can. As of Feb 08 2024, these are still theoretical and don't exist

How many branches of AI are there?
There are 6 branches:
1) Machine learning: makes predictions or decisions based on data.
2) Deep learning: a subset of machine learning, based on multi-layer neural networks.
3) NLP (Natural Language Processing): Can have a dialogue in a natural human language.
4) Robotics: software than performs tasks autonomously.
5) Expert systems: Solve complex problems in a way that looks like a human decision maker.
6) Computer vision: Can interpret visual images.
Software solutions may incorporate some, or all, of the branches of AI.

When were commercial software tools available for the different branches of AI?
1950s beginning of using computer for tasks that mimic human cognitive functions. E.g. Logic Theorist.
1980s expert systems designed to mimic the decision-making processes of human experts.
1990's, 2000's AI technologies embedded in more generalized software, without being identified as AI.
2010s Machine learning, deep learning and big data.
2020s Large Language Models.

Is Google search an example of AI?
Yes. Some of the AI technologies in Google search include:
1) Natural language processing;
2) Semantic understanding: understanding concepts, relationships between words ,and context

3) Ranking Algorithms: ranking search results based on the authority of a website, quality of content, and how well it matches the search query.
4) Machine learning algorithms: machine learning continuously improves search algorithms, based on user interactions and feedback.

What is generative AI?
Generative AI is a type of technology that is designed to create or generate new content such as text, images, music, and code that is often undisguisable from content created by humans. The AI has been trained on large amounts of existing content.

What is ChatGPT-4?
ChatGPT is software developed by OpenAI. It's designed to generate human-like text based on the input it receives. ChatGPT can answer questions, write essays, create stories, and perform a variety of language-based tasks

What does GPT stand for?
GPT stands for "Generative Pre-trained Transformer." "Generative" indicates its ability to generate text, "Pre-trained" means it has been trained on a large dataset before being fine-tuned for specific tasks, and "Transformer" refers to the type of neural network architecture it uses.

How much data was used to generate the ChatGPT-4 model?
1) 45 Terabytes of data was used to create the ChatGPT-3 model.
2) Third party estimates are that 100s of terabytes of data were used to create the ChatGPT-4 model.

How big is the ChatGPT-4 model?
1) Third party estimates are that the model has from 1.76 trillion parameters to 100 trillion parameters.
2) I used the Perplexity AI search engine to find this information. ChatGPT-4 did not provide me with helpful answers.

What is a parameter?
A parameter is a floating-point number.
That's right. 100s of terabytes of data are processed to create a data base of up to 100 trillion floating-point numbers.

Is ChatGPT-4 A Large Language Model?
Yes

What is a Large Language Model?
A type of AI designed to understand, generate, and manipulate human language. The "large" refers to the large number of parameters they contain, which can range to the hundreds of billions.

What is a Small Language Model?
The basic functionality is similar to a Large Language Model. There are fewer parameters, ranging from tens of thousands to a few hundred million. The models have few capabilities to: understand complex language and context, and the create appropriate content.

What are the steps to create a Large Language Model?
1) Research and Planning (defining objectives and designing the architecture)
2) Data collection, cleaning and preprocessing (filtering harmful or irrelevant content)
3) Model development: choosing a machine learning framework and creating a prototype to validate the concept.
4) Training the model: pre-training on the initial data. Adjust the hyperparameters to optimize performance. Manage the computing resources to train the model.
5) Evaluation and refinement: metrics-based performance evaluation. Fining tuning with more specific data. Analyze errors to improve the model.
6) Implement additional features
7) Testing
8) Deployment
9) Continuous improvement: monitor performance and make improvements. Update with new data.

How many people are required to create a Large Language Model?
The team size could range from 20 people to hundreds. The skills could include: research scientists and machine learning engineers, data scientists and data engineers, software developers, systems administrators, product

managers, ethics and compliance officers, quality assurance and testing specialists, and technical writers and documentation specialists.

What the major steps Chatgp-4 goes through when asked to do something?
1) The text is transformed into floating-point numbers.
2) Then these numbers are processing by the floating-point numbers in the model.
3) The output is floating-point numbers.
4) The output is then transformed into text.

Fundamentally, is ChatGPT-4 a word predictor?
1) Yes, fundamentally, ChatGPT-4 can be viewed as an advanced form of a word predictor, but it's a highly sophisticated one.
2) ChatGPT-4 doesn't "understand" text in the human sense. It's predicting text based on patterns it learned during training

How does ChatGPT-4 do mathematical, financial, and statistical analysis?
ChatGPT-4 has tools capable of performing mathematical, financial, and statistical analyses

Do scientists understand why Large Language Models are able to do what they can? Do scientists have models which can predict the behaviour and capabilities of Large Language Models?
The basic mechanism (e.g. predicting the next word in a sequence based on training data) are well understood.
As the models have gotten larger, they have capabilities that are difficult to predict or explain.

The following did not come from ChatGPT. They are a few quotes from the article "Large language models can do jaw-dropping things. But nobody knows exactly why" The article was published in the MIT Technology Review March 04, 2024.
1) "We don't know what capabilities GPT-5 will have until we can train it and test it"
2) "Lots of people have opinions" but no consensus about what exactly is going on
3) "The biggest models are now so complex that researchers are studying them as if they were strange natural phenomena, carrying out experiments and trying to explain the results."
4) "Most of the surprises concern the way models can learn to do things that they have not been shown how to do." "This is one of the most fundamental ideas in machine learning – and its greatest puzzle"
5) "Large language models are a whole new mystery"

I still don't understand, and cannot explain in simple terms, how ChatGPT-4 can write a birthday greeting in the style of William Shakespeare.

What are your next steps?
1) You must do your own fact-based research. The bulk of the above article was based on ChatGPT-4 responses.
2) Define the words/concepts you're using, in a glossary. I've seen major confusion when the same words mean different things to different people.
3) Identify the role. The role could be a team (such as the board of directors) or an individual.
4) Define the long-term value of the role in your company's future scenarios. Outline the metrics for measuring the value of the role.
5) Determine the talent components required for the role. You can use the talent components in Appendix 1, or develop your own. If you already have documented talent components, review to ensure they are comprehensive.
6) This can be people, technology, or some combination
7) Define the criteria for assessing and recommending an option. These criteria include risk management. Determine how to manage risk when the outcomes of software solutions cannot be predicted or modeled.
8) Define the options for providing talent. These options could be: people, technology, or some combination.
9) Technology can range from very simple software, through different types of data/knowledge retrieval, through different types of analytical tools, through different types of AI. And there can be a combination of software. Software can include tools and software packages. Generative AI and Large Language Models are not always the answer for every need.
10) Prepare an ongoing assessment and development process for the role. In the current, and future, hypercompetitive world, talent capabilities must continuously improve. In the future, technology may play a greater, or lessor, part in a role.
11) Two additional factors to consider: Is a role part of the career development process for people? What will be the impact on career development if the role is automated? Is the value of the role included building and maintaining a relationship with people? Will those people be able to have relationships with roles that are automated?

Appendix 1 – The 10 core components of talent[1]
1) Self Awareness
2) Character
3) Relationship skills
4) Communications
5) Crystalized intelligence
6) Fluid intelligence
7) Cognitive skills
8) Ability to quickly learn and unlearn
9) Creativity
10) Physical capabilities

Footnotes
[1] What are the core components of talent? Koor and Associates
http://koorandassociates.org/creating-business-value/core-components-of-talent/