**How Construction Firms Can Leverage AI Tools Like ChatGPT and AR/VR**

Artificial Intelligence (AI) tools are becoming more mainstream today, and an increasing number of professionals, such as designers, engineers, and manufacturers of heavy duty equipment are looking at ways to incorporate various AI-driven technologies into their workflows.

Automation technology using AI can be programmed to complete logical processes for construction equipment manufacturers. With the already large array of technological applications and programs businesses use, what makes AI technology the next best thing? First, AI technology is flexible. It can be used by many industries in their own unique way, such as aiding them in data mining, targeted marketing or constructing precision-based financial models.

AI today can also be found in other markets such as medical equipment manufacturers, construction equipment producers, tech and engineering firms for aerospace and automotive, mining precincts, utilities, oil and gas. Not only is the technology flexible in its implementation, but in what it is compatible with. This technology can work with diverse business applications, and structured or unstructured data.

ChatGPT is the latest technology driven by AI that uses natural language processing. It leverages deep learning algorithms to enable users to converse with chatbots. What has captured the attention of designers and engineers is that it is an advanced system that can understand complex questions and provide very accurate answers almost immediately. Because it was developed with conversational AI capabilities, it can immediately comprehend user queries and generate natural-sounding responses that are tailored to the conversation context. It also has built-in memory capability that stores information from past conversations to better respond to subsequent messages.

However, engineers and designers are also realizing that many projects throughout vertical industries require more than just the development of text and responding to prompts. That is why these professionals are combining the powers of AI tools along with other progressive technologies like mixed immersive reality (augmented reality and virtual reality). They are building AI-models like ChatGPT to help create virtual worlds in the metaverse to run simulations and increase productivity/efficiency metrics. More specifically, AI tools like ChatGPT and the metaverse can help create a 3D environment that replicates the real world, and the data used can be harnessed for analysis, running simulations and interacting with data more efficiently.

There are still some limitations with ChatGPT. As an example, when engineers are designing tools or products, AI technologies cannot recognize when physical items move and must be manually told that it is in a different location. That being said, technology such as ChatGPT can significantly assist with coding the virtual 3D world and running simulations. Historically this coding has been done manually, but with AI tools the developer time can be increased ten-fold.

Developers writing code will benefit because ChatGPT can create the vast majority of the code, while developers are then left to use resources to debug much less of the code. They can actually spend more time on innovation. Workers on the manufacturing floor will then better understand the code and language produced by ChatGPT through its natural language ability. As an example, the tools can provide alerts that increase safety standards when entering a hazardous section of the plant floor or when operating heavy equipment. Training and test simulations conducted within metaverse environments will also benefit from increased safety practices.

AI tools such as ChatGPT will also play a leading role in helping to create code and language used in the development of digital twins - the virtual world where people, consumers, workers all gather to communicate, collaborate, and share through a virtual presence on any device. This means companies will build immersive virtual spaces, and it will allow employees to virtually collaborate using their digital twin through chats, emails, video calls and even face-to-face meetings.

The power of simulation will be an exact game-changer for enterprises and businesses throughout the metaverse in a variety of industries, such as optimizing production planning in the automotive sector, accelerating design in the aerospace industry, improving overall production efficiency for manufacturers, and increasing accuracy for consumer packaged goods companies, many companies are poised to leverage virtual simulation to make better business decisions and generate the greatest return on investment. Following are several other examples how AI tools such as ChatGPT will benefit designers, engineers and manufacturers:

**Automation Support.** Engineers will have proximity to leading technology that supports automation processes and reduces time spent on manual tasks, like collecting data, preparing reports, and monitoring trends in their industry.

**Task Planning and Management.** This is particularly critical for engineers since it requires a vast amount of organization, discipline, and time management when completing tasks effectively. Technology like ChatGPT can improve the process by enabling an intuitive platform for task planning and management.

**Knowledge Sharing.** Engineers and their teams will be able to increase collaboration and efficiency in the workplace since tools like ChatGPT allow for streamlined knowledge sharing between engineers and other employees at work.

**Error Detection.** This is an area that has always been a large issue for engineers as they continue to seek the most efficient ways to identify errors, which lead to time and cost savings. The use of natural language processing will now be leveraged to visualize errors in text-based data faster than ever before, critical in code review, error analysis, or debugging.

**Security and privacy:** Security and privacy is one of the biggest issues facing today’s world. Since metaverse environments have the digital twin as an integral part, the metaverse will have much richer data. The security and privacy in metaverse environments cannot be solved by traditional security tools. However, technologies like AR/VR leveraging leading AI tools are better equipped to handle security and privacy related to digital twins.

Engineers, designers and manufacturing employees will continue to leverage virtual worlds built with metaverse environments because they will be important for all businesses, enterprises and consumers. Today, with the help of AI tools such as ChatGPT, businesses will see an increase in productivity like never before.

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