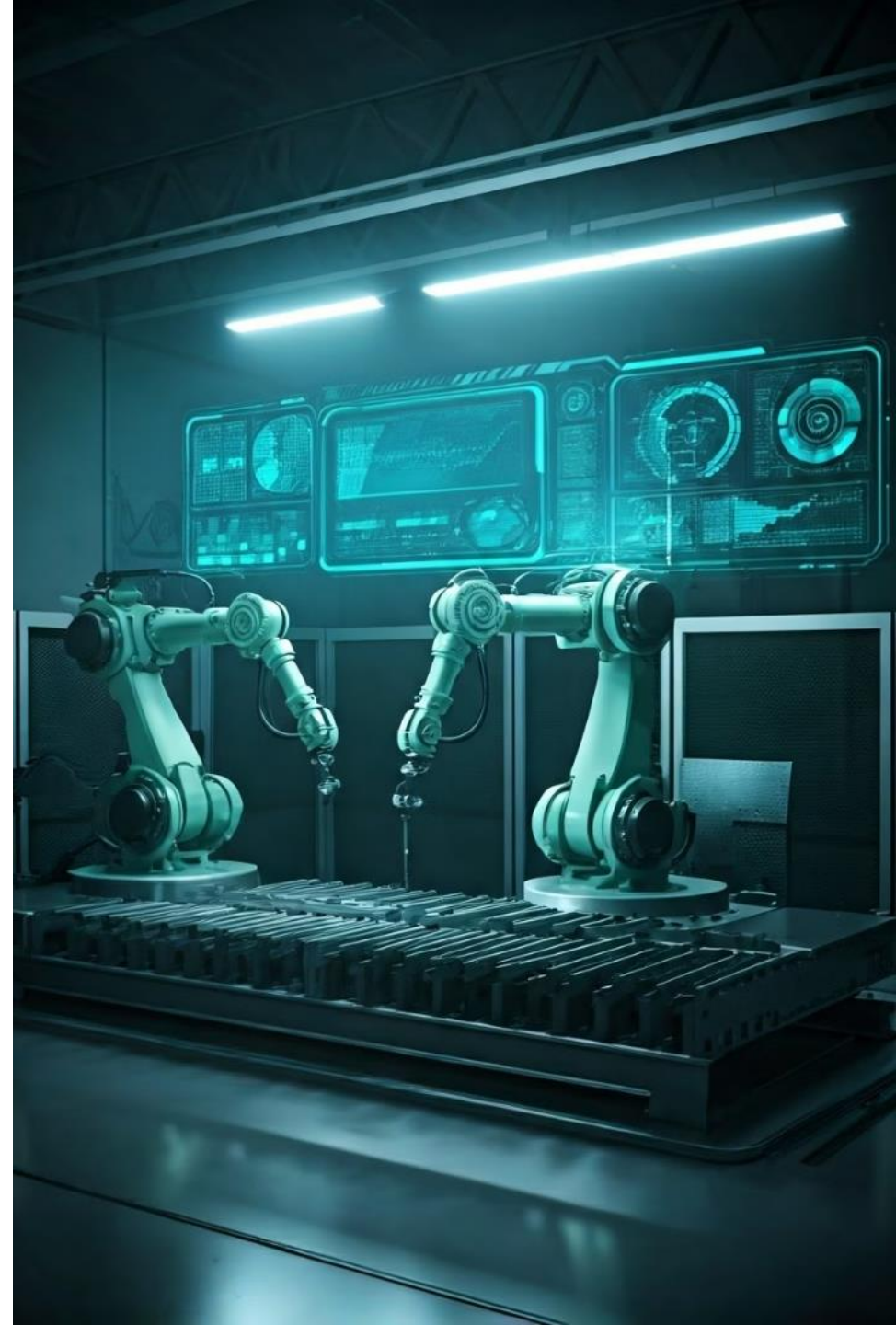


Leveraging Artificial Intelligence in the Steel Fabrication Industry

Presented to the Mid-Atlantic Steel Fabricators Association

May 13, 2025

By Jason Copley, Esq.



ARTIFICIAL INTELLIGENCE IS CHANGING THE WORLD



ALL BUSINESSES MUST ADAPT TO AI

AI is no longer a luxury but a necessity.

Steel fabricators are no exception.

There are practical AI applications for enhanced operations in the steel fabrication industry that can transform your business through improved efficiency, accuracy, and competitiveness.

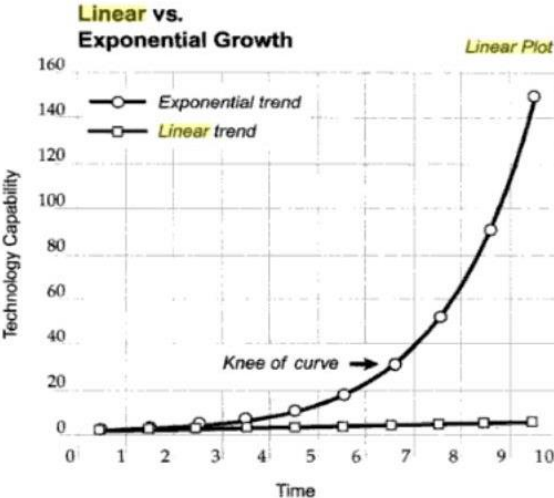


EXPONENTIAL GROWTH OF TECHNOLOGY

“The rate of technological progress is accelerating exponentially rather than linearly. Advancements built on one another, leading to faster and more profound technological innovations over time.”

Ray Kurzweil

Law of Accelerating Returns



Linear versus exponential: Linear growth is steady; exponential growth becomes explosive.

THE AUTOMOBILE – TONY SEBA

5th AVE NYC

1900

Where is

the
car?



THIRTEEN YEARS LATER

5th AVE NYC

1913

Where is

the
horse?



ADOPTION TO ONE MILLION USERS

Telephone (1876) – 35 years

Cars (1890s to 1940s) – 50 years

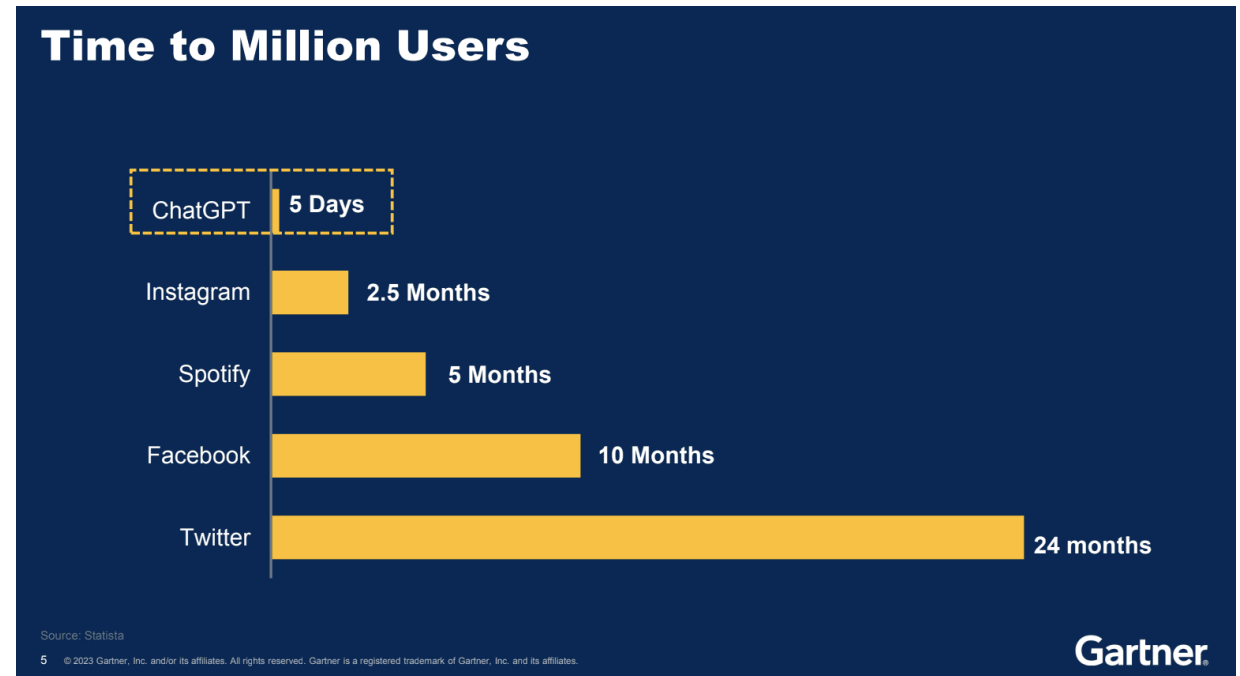
Radio (1920s) – 5 years

Television (1950s) – 10 years

Personal Computers (1960s) – 5 years

Internet (1990s) – 4 years

ChatGPT – **5 DAYS**



THE AGE OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) refers to the capability of computer systems to perform tasks that typically require human intelligence, such as learning, problem-solving, decision-making, and understanding language.

Machine Learning (ML), a subset of AI, enables systems to learn from data, identify patterns, and make predictions without being explicitly programmed for every scenario.



AI ADOPTION & TRENDS IN THE CONSTRUCTION INDUSTRY

Research indicated that 72% of organizations across various industries had adopted AI in at least one business function in 2024, with similar adoption trends observed in construction.

The outlook for 2025 points towards AI becoming an increasingly practical and integrated component of daily construction operations.

AI tools can analyze project communications (like emails, meeting minutes) or site reports to identify events that necessitate issuing a formal notice, such as documented delays, scope changes, or unforeseen conditions.

WE ARE ENTERING THE ERA OF THE SUPERWORKER WHERE AI DOESN'T REPLACE PEOPLE, IT AMPLIFIES THEM.

- SCOTT WIEMELS CEO @ 24G | DRIVING AI-WORKFORCE TRANSFORMATION



USEFUL AI PLATFORMS

ChatGPT (by OpenAI)

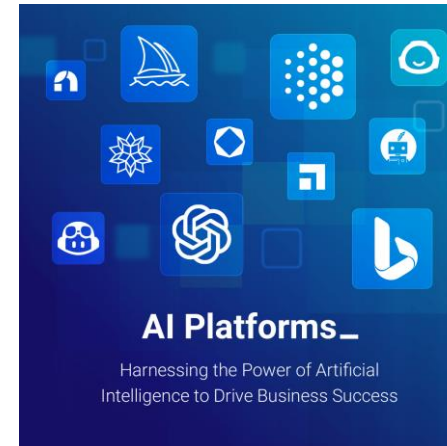
Gemini (by Google) – Includes YouTube Summarization

Claude (by Anthropic)

Grok (by xAI)

NotebookLM

Perplexity



Each one (except NotebookLM) now includes Deep Research capability.

THE IMPORTANCE OF THE PROMPT

A prompt refers to the input or instructions given to the AI model to generate a desired response. It can be a question, a command, or any kind of textual input designed to elicit a specific type of output from the model.

Prompt engineering is the art and science of crafting effective inputs to optimize AI outputs. It is crucial for ensuring that AI models provide useful, accurate, and contextually relevant information.



WHAT IS CHATGPT?

A type of artificial intelligence that can understand and generate human-like text.

A really smart text generator that that can write, answer questions, and chat.

It is pre-trained on a vast amount of data from the Internet.

The generative AI tool can answer questions and assist you with composing emails, essays, code, summarize documents, search for information, create images, and much more.



HOW CAN AI BE USED BY STEEL FABRICATORS?

Artificial Intelligence, particularly Generative AI models like ChatGPT or Google Gemini, can significantly streamline the initial drafting process for standardized construction notices.

Preparation of Notice Letters

Summarizing Documents

Analyze Contract Documents

Explain Technical Data

Internet Searching on Steroids



NOTICE LETTER DRAFTED BY AI

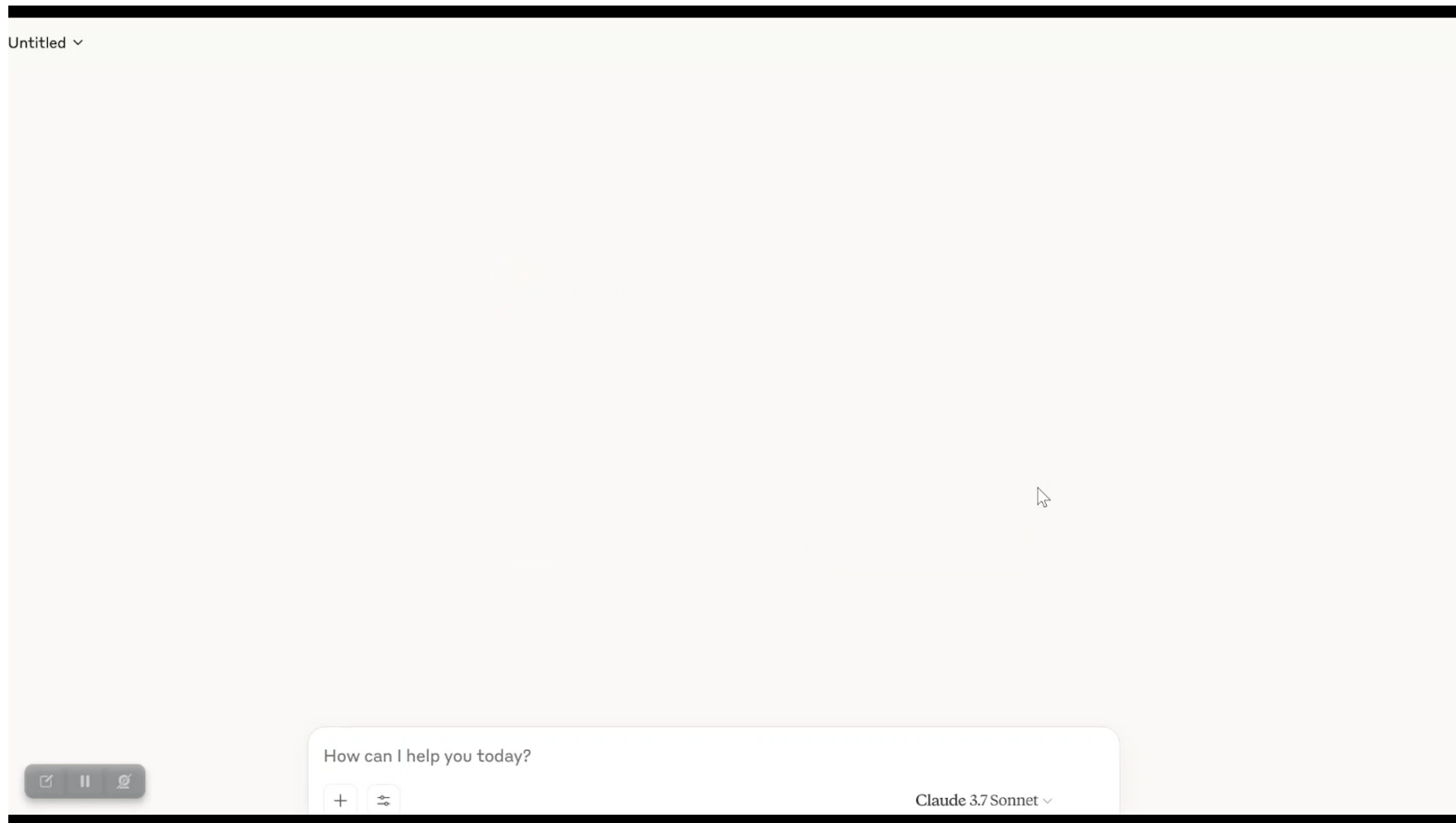
Draft a letter that a contractor erecting structural steel can send to the owner notifying him that the adverse subsurface conditions, amounting to differing site conditions, are delaying project performance.



Claude 3.7 Sonnet ▾



AI RESULT



DOCUMENT SUMMARY


What can I help with?

Please prepare a comprehensive summary of the recent Executive Order regarding steel tariffs.



 Search

 Deep research

 Create image



CHATGPT RESPONSE

ChatGPT 4o

Temporary



What can I help with?

Please prepare a comprehensive summary of the recent Executive Order regarding steel tariffs.

+ Search Deep research Create image ...



GOOGLE ON STEROIDS - PERPLEXITY

What do you want to know?

Please provide an overview of how members of the Mid-Atlantic Steel Fabricators Association can benefit by incorporating AI into their daily workflow.

 Search  Research



THE RESULT

What do you want to know?

Please provide an overview of how members of the Mid-Atlantic Steel Fabricators Association can benefit by incorporating AI into their daily workflow.

Search Research



Pro Enterprise API Blog Careers Store Finance English v

NOTEBOOKLM

When using NotebookLM, by Google, the model will use the sources (documents) you upload to answer your questions or complete your requests.

The app instantly creates a source overview that summarizes the document and offers key topics and questions to ask. Think of it as a research assistant that helps you better understand the source material.



TEKLA POWERFAB 2025

Enhanced workflow automation reducing manual errors

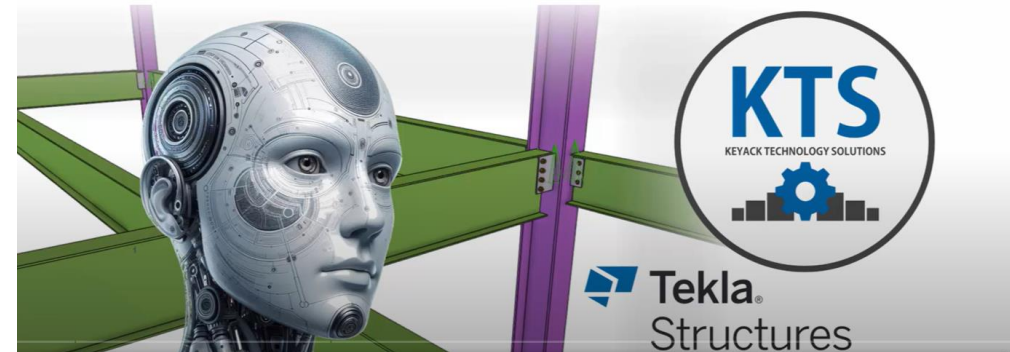
New multi-facility production planning capabilities

Improved change management system for better operational efficiency

Introduction of AI-powered assistance for technical support

Released March 12, 2025

Artificial Intelligence for Tekla Connections?



HOW TO USE AI EFFECTIVELY

More detail is better

- **Include as many dates and facts as possible**
- **The more information you give the AI, the better the end result will be**

What can I help with?

I am steel fabricator and I have a question about a contract, the contract states that there is a requirement regarding MBE/DBE, however it is hard to understand exactly what it means. Can you try and figure it out. To help you, I am adding a copy of the contract, as well as some related materials, including a similar contract with this party that I entered into last year.



Search

Reason

Deep research

Create image



AI GENERATED DELAY LETTER

H A steel fabricator has been delayed in the manufacture of steel products for a construction contractor because the contractor failed to provide specifications and drawings in a timely manner; inserted requirements that were not previously discussed and were impossible to perform within the projected time frame; and, because components were not available as a result of supply chain shortages and Buy America Act requirements. Please draft a letter putting the contractor on notice of this contractor-caused delay for which the fabricator is not responsible.

H Here are some additional dates to help you create a timeline. The contract was signed on April 1 2024, we were delayed in our start time due to the contractor's specification and drawings issues. We notified the contractor of this issue following a project meeting on April 30 2024 and again on May 15 2024 via email. In addition regarding the additional components that were not available we notified the contractor via email on April 25 2024 and again on May 10 2024. Regarding the requirements following a project meeting on April 30 2024 we notified the contractor and we notified again on May 10 2024

AI GENERATED DELAY LETTER

The screenshot shows a chat window with a light gray background. At the top left, there is a tab labeled "Untitled". On the left side, there is a vertical sidebar with a red plus icon and a magnifying glass icon. In the center, a message from the AI (indicated by a small "H" icon) contains the following text:

A steel fabricator has been delayed in the manufacture of steel products for a construction contractor because the contractor failed to provide specifications and drawings in a timely manner; inserted requirements that were not previously discussed and were impossible to perform within the projected time frame; and, because components were not available as a result of supply chain shortages and Buy America Act requirements. Please draft a letter putting the contractor on notice of this contractor-caused delay for which the fabricator is not responsible.

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Below the text is a red asterisk icon. At the bottom left, there is a large dark blue circular profile picture with a white letter "H". To its right is a control bar with a red stop icon, a pause icon, a back icon, a timer showing "0:00", and icons for a grid, refresh, and trash. At the bottom center, there is a text input field with the placeholder text "Reply to Claude...". To the right of the input field, there is a small hand cursor icon, a plus icon, a pencil icon, and a dropdown menu showing "Claude 3.7 Sonnet" with a camera icon.

VERIFICATION IS CRITICAL

Any information provided by an AI platform must be checked for accuracy.

AI platforms can hallucinate.

Legal advice may be misleading or incorrect.



WHAT IS THE MOST COMMON STEEL BEAM SIZE FOR A FOUR STORY OFFICE BUILDING

For a standard 4-story office building (with typical floor-to-floor heights of 10–12 ft and moderate loads), commonly used wide-flange (W-shape) steel beams are:

- **W16x40 to W24x76** for floor beams
- **W12x26 to W18x35** for secondary beams or joists
- **W18x40 to W24x76** for girders

Influencing Factors...

Common Example: For a typical **30-foot span**, a **W21x44** or **W24x55** is often used in office buildings with composite floor systems.

WHAT ARE COMMON COLUMNS IN THE SAME BUILDING

For a 4-story office building, steel columns typically increase in size from the top floor to the base to support cumulative loads. Here's a general guide to common column sizes based on typical loading and layout conditions:

Typical Steel Column Sizes:

- **Top Floor** – W10x33, W10x49, or W12x50
- **Mid-Levels** – W12x53, W14x61, or W14x74
- **Ground Floor/Base Columns** – W14,90, W14x120, or heavier

Influencing Factors...

Common Example: In a **30'x30' bay**, with **composite decking and standard office loading**, the base column might be a **W14x109**, tapering to a **W12x50** at the top level.

BEST PRACTICES FOR A CONNECTION

Simple Shear Connection (Most Common & Economical)

- Best for gravity framing where lateral loads are resisted by bracing or shear walls.

Double Angle Connection (bolted)

- **Angles:** (2) L4x3x5/16 or L4x3x3/8
- **Welded** to the beam web or bolted to both column and beam
- **Bolts:** 3/4" A325 bolts (3 or 4 bolts typical)
- **Location:** Angles shop-welded to beam web, field-bolted to column flange

Shear Tab (Single Plate)

- **Plate:** 3/8" thick x ~6" wide
- **Welded** vertically to the column flange
- **Bolts:** 3/4" diameter (3–5 bolts) to beam web

BEST PRACTICES FOR A CONNECTION

Moment Connection (if lateral frame)

- If you're designing for **moment resistance** (e.g., in a moment-resisting frame)

Flange Plate or Welded Flange + Shear Web

- **Top and bottom flange plates** (or full-penetration welds) connect to column flange
- **Web plate (shear tab)** handles vertical shear
- Requires **prequalified details (AISC 358)** for seismic zones

WHAT IS NEXT?

AI will continue to improve exponentially.

AI is a tool that will augment and enhance a human's skills.

AI will not replace people in the steel fabrication industry, but those who embrace AI will replace those who don't.

AGI will be the next game changer, possibly in as little as 3-5 years

(Intelligence that mimics the human brain)



THE END

