

Agentic AI in Construction: Redefining Modeling and Digital Responsibility

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about:us

Henri Molde

AI Product Manager

- Joined Trimble 2014
- Doctoral researcher in AI
- Leads AI research for Tekla
Adoption of Agentic AI in Tekla



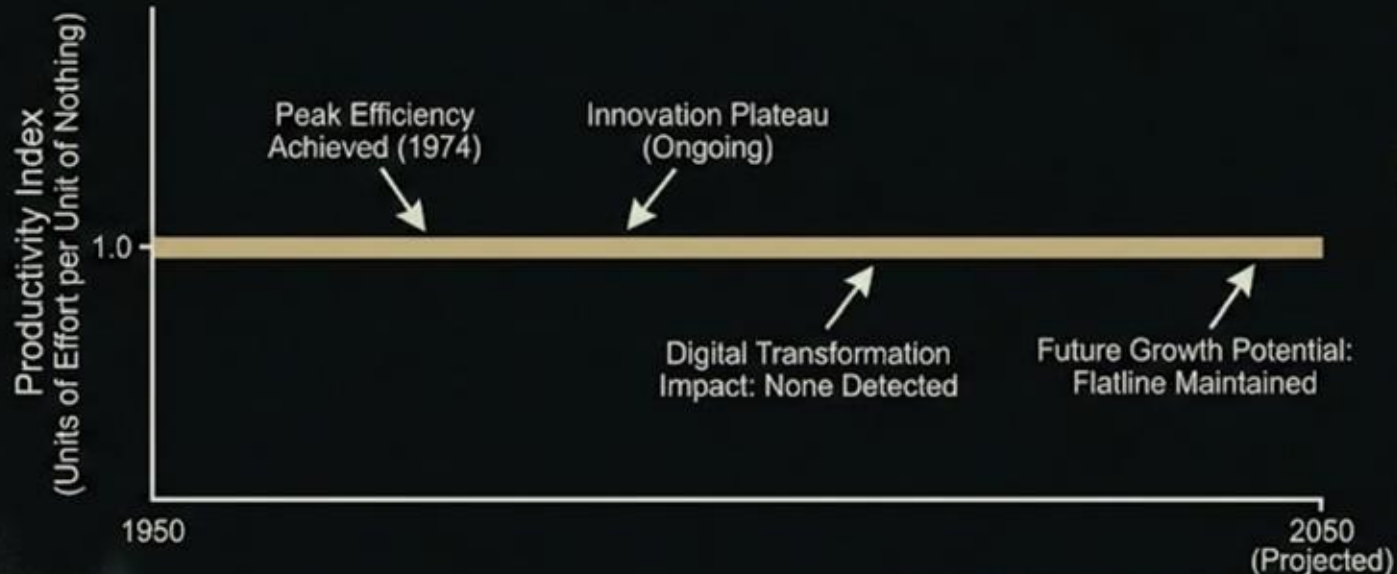
Kim Nyberg

Senior Technology Director

- Joined Tekla 1991, Trimble 2011
- M.Sc Computer Science
- Leading Technology Unit
- **AI**, Robotics, UX, Web, XR
- **"Chief Gadget Officer"**



OFFICIAL CHART: GLOBAL CONSTRUCTION PRODUCTIVITY TRAJECTORY (OPTIMIZED VIEW)



Generated by Infra-Slop v4.0 | Status: Good Enough





The "Cognitive Tax" in AEC

The Problem: Engineering is difficult, and so are the tools.

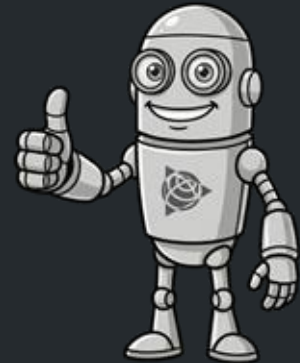
Information Overload: Project complexity has skyrocketed in recent years

Software Silos: Data "translation" between CAD, BIM, and Field tools

Labor Scarcity: A growing talent gap requires more efficiency from existing teams

Labor shortage + Information Overload + Software Silos

Agents can help!



Tekla Open API, ChatGPT, Bing Chat

The screenshot shows the Bing AI chat interface. At the top, there's a search bar and navigation links. Below that, a message says "Hello, I'm here to find information for you. Start by asking me a question." A dark blue box contains the prompt: "Create a Tekla Structures macro in C# that creates a 10x10 grid of 6 meter HEA400 columns, with beams connecting the top in a grid." The response area shows a C# macro for Tekla Structures that creates a 10x10 grid of 6 meter HEA400 columns with beams connecting the top in a grid. The macro code is as follows:

```
using System;
using Tekla.Structures.Model;
using Tekla.Structures.Geometry3d;

public class Example
{
    public static void Main()
    {
        Model model = new Model();
        for (int i = 0; i < 10; i++)
        {
            for (int j = 0; j < 10; j++)
            {
                // Code for creating columns and beams
            }
        }
    }
}
```

At the bottom, there are buttons for "New topic" and "Ask me anything..."

A.D. MMXXIII



Agentic AI: Solving the Cognitive Tax

Content filtering and summarization



Agents filter noise, Summarize project data and surface relevant information to reduce cognitive overload

Force multiplier



Agents automate repetitive tasks and provide expert assistance enabling teams to achieve more

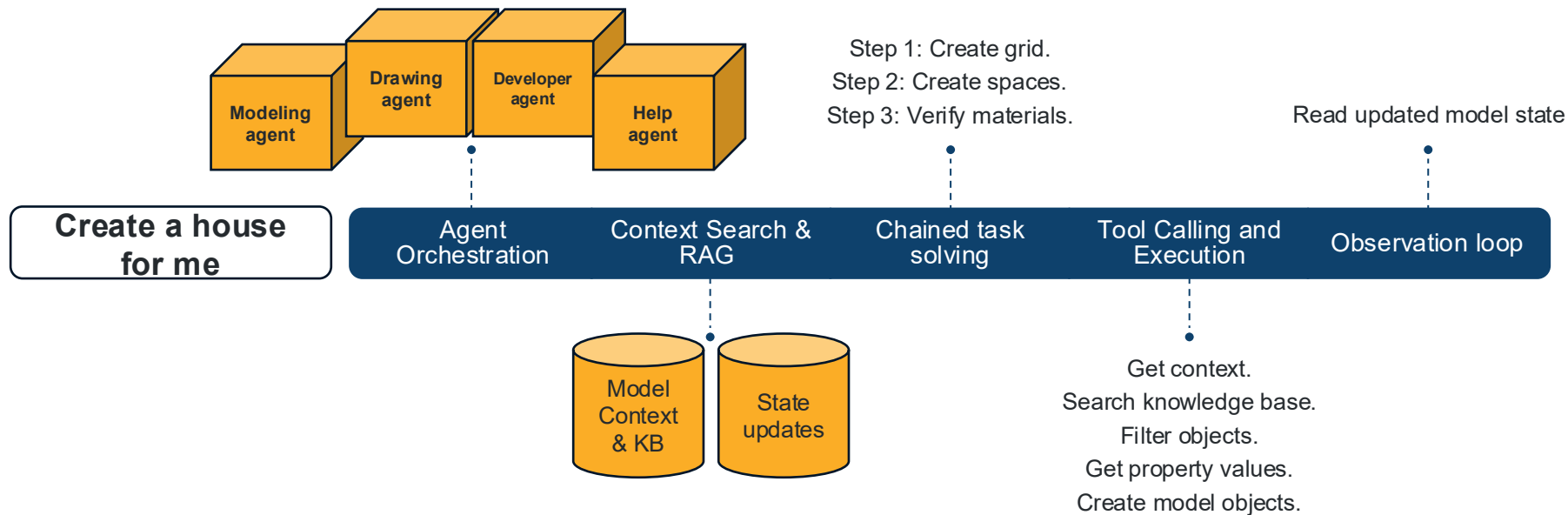
Autonomous data interoperability



Multi-agent systems can handle data exchange between different tools with minimal user interaction breaking down software silos



Agentic AI: Example cases



Create a house for me



Entry is through a door that leads into the living area.
 Living Room: A well-furnished space with seating, a television, and hardwood flooring. It is well-lit with natural light from the windows and has access to an outdoor area.



User & Developer Assistant

The image displays two side-by-side screenshots of the Tekla Structures software interface, illustrating the 'User Assistant' and 'Developer Assistant' features.

Left Screenshot (User Assistant):

- Toolbar:** Includes icons for 'Document manager', 'Drawing properties', 'Create fabrication drawing', 'AI Cloud Fabrication drawings', 'Create GA Drawing', 'Master drawing catalog', 'Perform num', and 'Multidrawin'.
- Assistant Panel:** Titled 'Trimble Assistant for Tekla', it shows a 'User Assistant' chat window. The chat history includes a question from 'You' about best practices for exporting IFC files and a response from the 'User Assistant' providing a list of steps: 1. Define Export Hierarchy, 2. Set IFC Entities, 3. Modify Property Sets, 4. Base Point Definition, and 5. Advanced Options.
- Model View:** A 3D model of a structural frame is visible on the left.

Right Screenshot (Developer Assistant):

- Toolbar:** Similar to the left screenshot, but with additional icons for 'Create fabrication drawing', 'AI Cloud Fabrication drawings', 'Create GA Drawing', 'Master drawing catalog', 'Perform num', and 'Multidrawin'.
- Assistant Panel:** Titled 'Trimble Assistant for Tekla', it shows a 'Developer Assistant' chat window. The chat history includes a question from 'You' about creating a 4x4 grid and a response from the 'Developer Assistant' providing a C# code snippet to create a 4x4 rectangular grid with 3000 mm spacing.
- Model View:** A 3D model of a structural frame is visible on the right.

Code Snippet (Developer Assistant):

```
1 using Tekla.Structures.Model;
2
3 public sealed class Macro
4 {
5     [Tekla.Macros.Runtime.MacroEntryPointAttribute()]
6     public static void Run(Tekla.Macros.Runtime.IMacroRuntime runtime)
7     {
8         var myModel = new Model();
9
10        // Create a new Grid object
11        var grid = new Grid
12        {
13            CoordinateX = "0 4*3000", // 4 grid lines with
14            CoordinateY = "0 4*3000", // 4 grid lines with
15            CoordinateZ = "0", // Single elevation at 0
16            LabelX = "A B C D", // Labels for X-axis
17            LabelY = "1 2 3 4", // Labels for Y-axis
18            LabelZ = "+0", // Label for Z-axis
19            ExtensionLeftX = 500.0, // Left extension for X
20            ExtensionRightX = 500.0, // Right extension for X
21            ExtensionLeftY = 500.0, // Left extension for Y
22            ExtensionRightY = 500.0, // Right extension for Y
23            ExtensionLeftZ = 500.0, // Left extension for Z
24            ExtensionRightZ = 500.0, // Right extension for Z
25        };
26
27        // Insert the grid into the model
28    }
29 }
```

DWIM – Model Assistant

The screenshot shows the Tekla Structures software interface. The main window displays a 3D model of a structure with dashed lines and labels A, B, C, 1, 2, 3. The top menu bar includes options like STEEL, CONCRETE, REBAR, EDIT, VIEW, DRAWINGS & REPORTS, MANAGE, ANALYSIS & DESIGN, TRIMBLE CONNECT, TEKLA POWERFAB, and TEKLA TEDDS. The right sidebar is titled 'Tekla Model Assistant - Preview' and contains the following content:

Tekla Model Assistant - Preview

AI Agent for Tekla Structures to help and perform various modeling and drawing operations.

What are your currently supported features?

Create 400x400 concrete columns at every grid intersection.

Show the differences in names and materials for the selected parts.

Previous Conversations

- Import Crane Model and Create Reinforced Building
- Import Crane Model and Create Reinforced Building

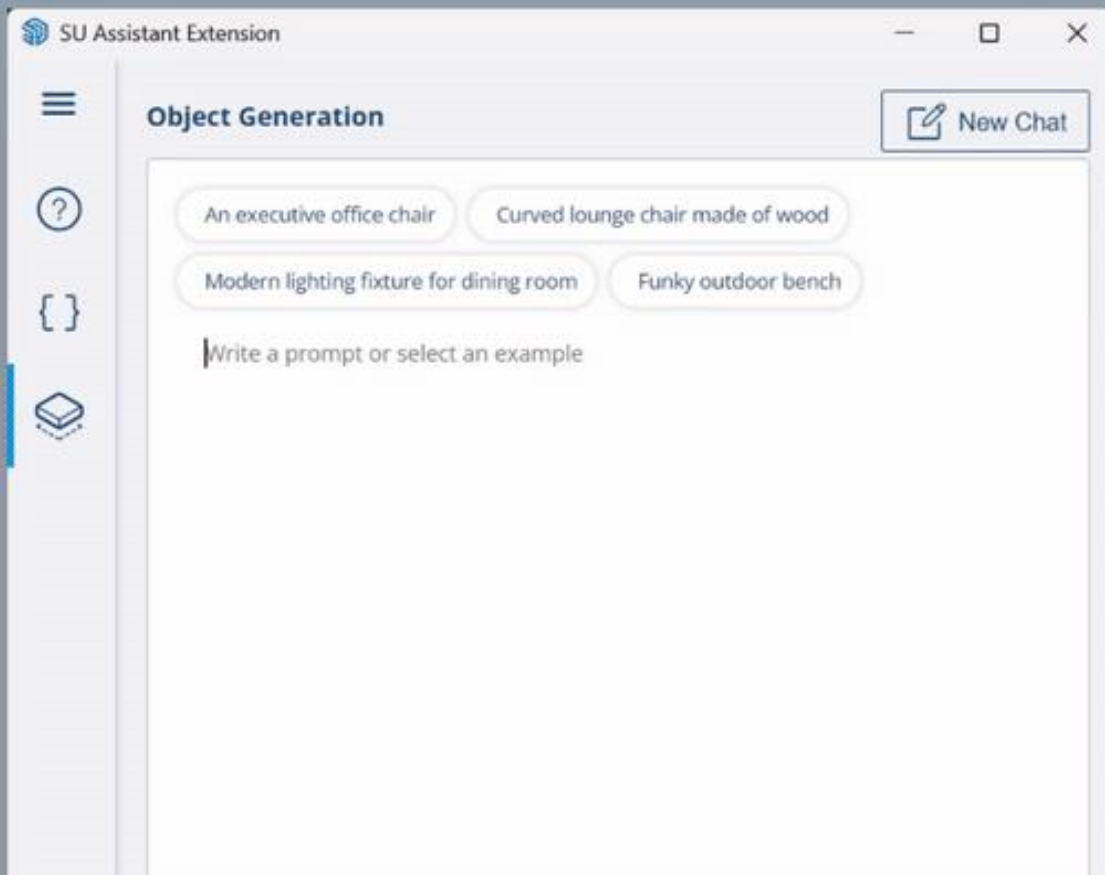
Import tower crane model from Connect. Then create a two story building with pad footings, columns, beams, slabs to the grid in model. Reinforce the structure. Then create a GA-drawing

Trimble AI can make mistakes. Check results.

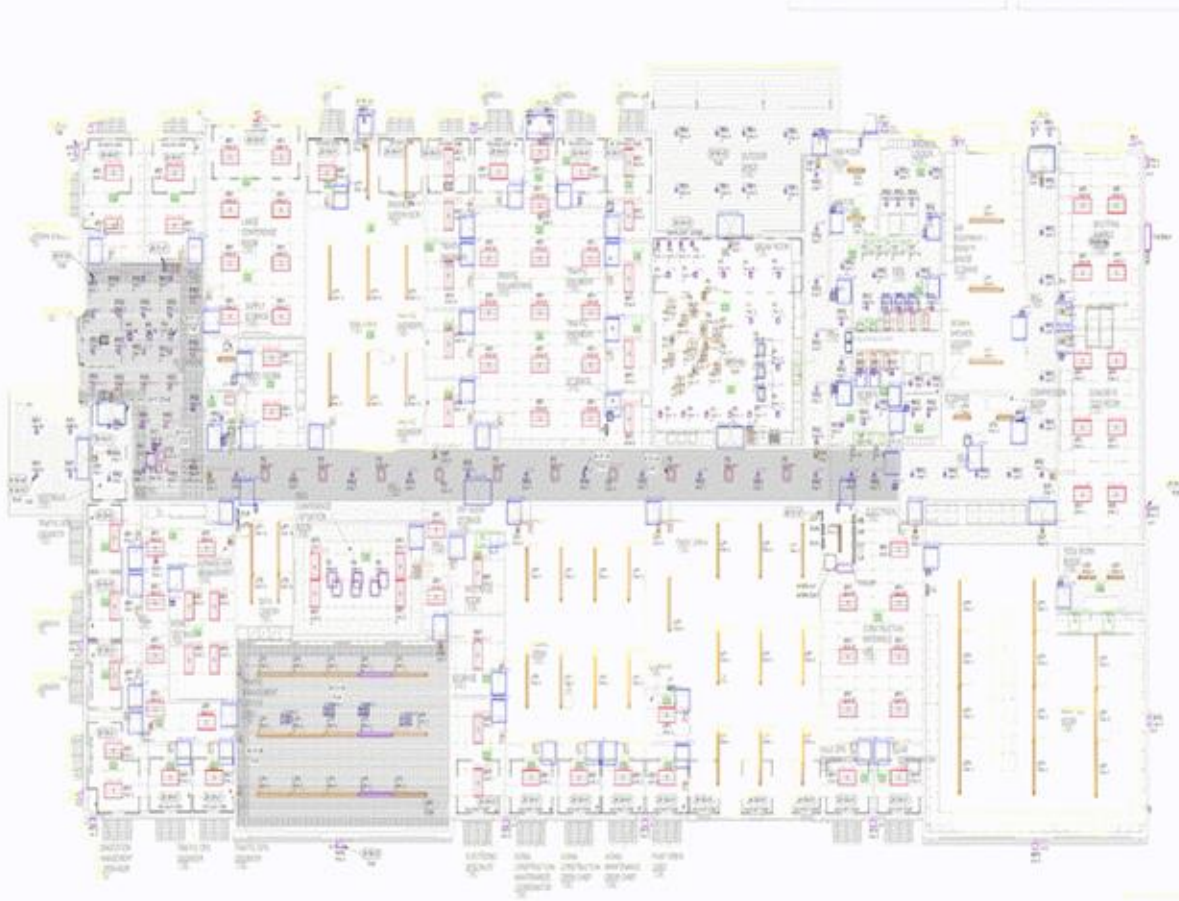
3D-Aware AI Rendering



Generate 3D Object from Image



Quantity Take-off: Dense, Large, Varied



Task

Count the number of each symbol type in a drawing

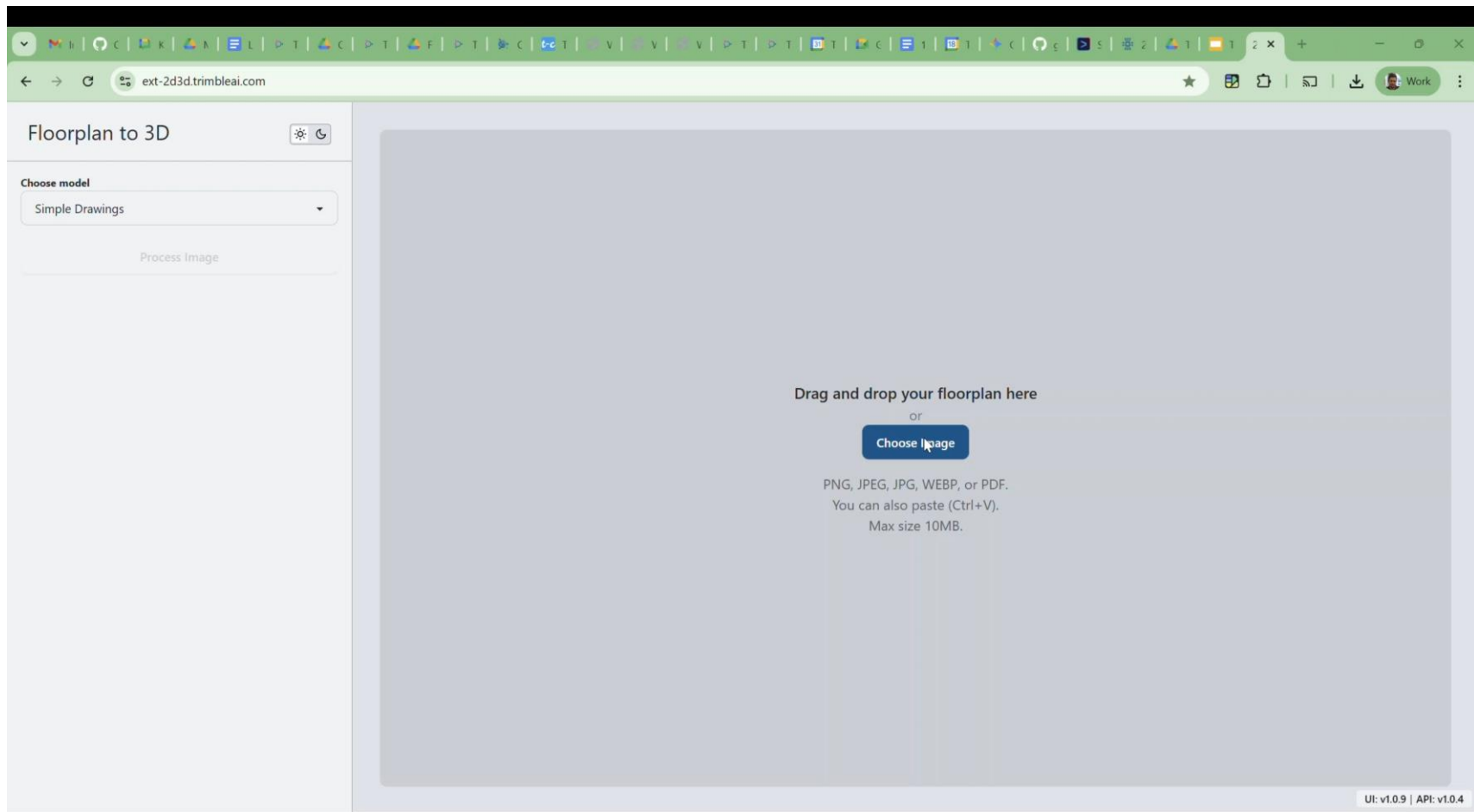
Example Estimate:

132 Duplex Receptacles
23 Quadruplex Receptacles
163 Single Pole Switches

.....
For ~200 classes of objects

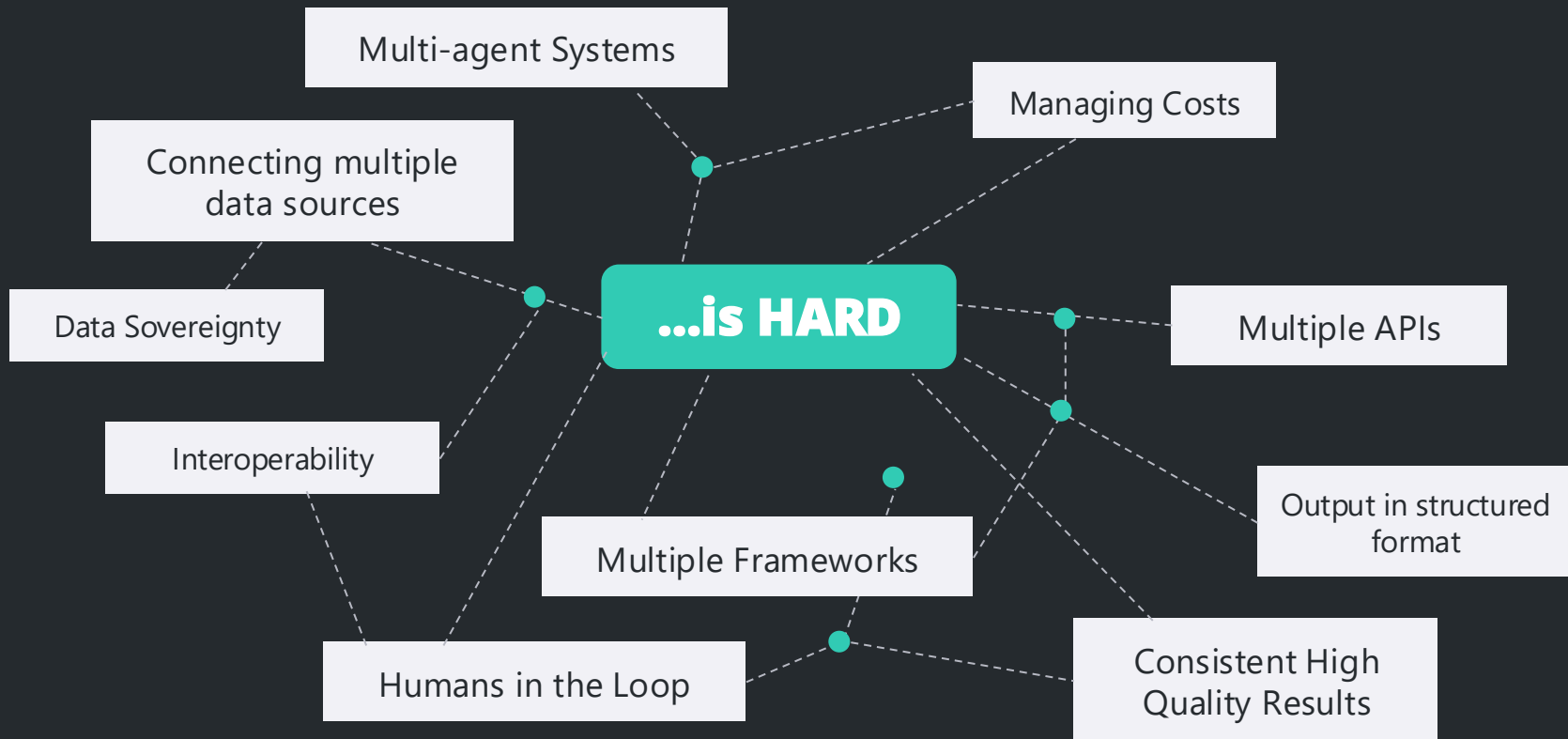
Estimators commonly do this by hand, taking hours if not days

Floorplan to 3D (labs.trimble.com)



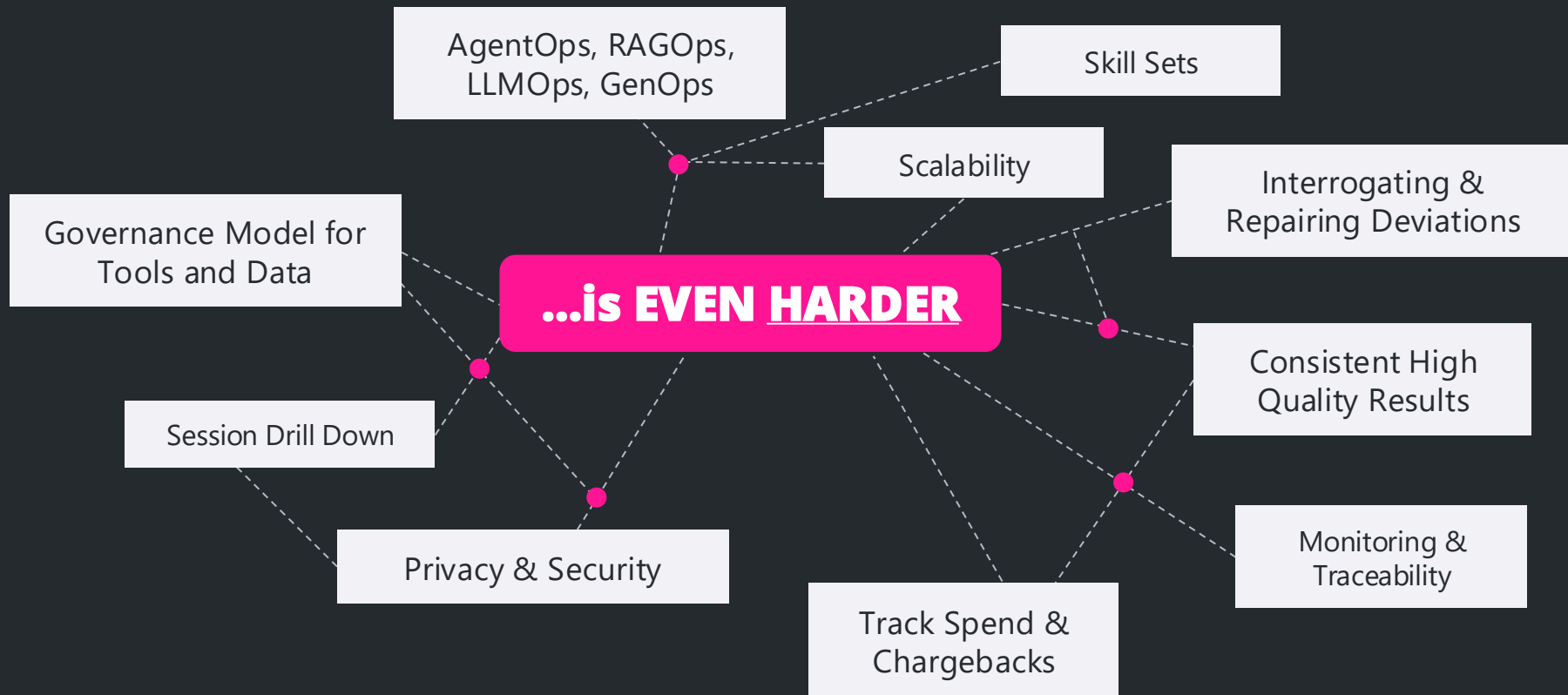


Building Enterprise Agents...





Deploying Enterprise Agents...



Agent Studio



Trimble Agent Studio

Agents Models Knowledge Tools

Create Agent

General

Agent Name *
Tekla Model Assistant - Preview

Description *
AI Agent for Tekla Structures to help and perform various modeling and drawing operations.

Instructions *
Example: You are a helpful and knowledgeable assistant that provides concise, accurate answers about our company's products. Always use a friendly, professional tone.

Conversation Starters

What are your currently supported features?
Create 400x400 concrete columns at every grid intersection.
Show the differences in names and materials for the selected parts.

Models

+ Add

AI claude-sonnet-4-5-20250929 anthropic

Knowledge Bases

+ Add

Original

Tekla Model Assistant - Preview

AI Agent for Tekla Structures to help and perform various modeling and drawing operations.

What are your currently supported features?
Create 400x400 concrete columns at every grid intersection.
Show the differences in names and materials for the selected parts.

Let's get more done

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Powered by Trimble AI. AI can make mistakes. Check important info.



HENSEL PHELPS
Plan. Build. Manage.

Business Case: **Submittal Review**

Hensel Phelps processes over 150,000 submittals per year.

It's estimated that each submittal takes approx 1 hr to process.

An agent that saves just 15 mins per submittal would be valued at:

\$3,000,000

****Est. labor cost: \$80/hr. 150k submittals * \$80/hr = \$12M. 25% time savings = \$3M.***

Summary

- Agentic AI will be a **force multiplier** for AEC
- A new **natural interface** to tools and data
- Agents as **trusted partners**, with a **human in the loop**

Questions?

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