Artificial Intelligence at Boeing

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PLM Road Map™ & PDT North America 2026

AI in PLM: A Disruptive Opportunity and Challenge

Turning AI disruption into enterprise value:
Strategic insights for the PLM professional

6-7 May 2026

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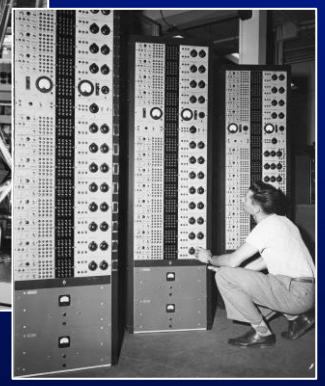
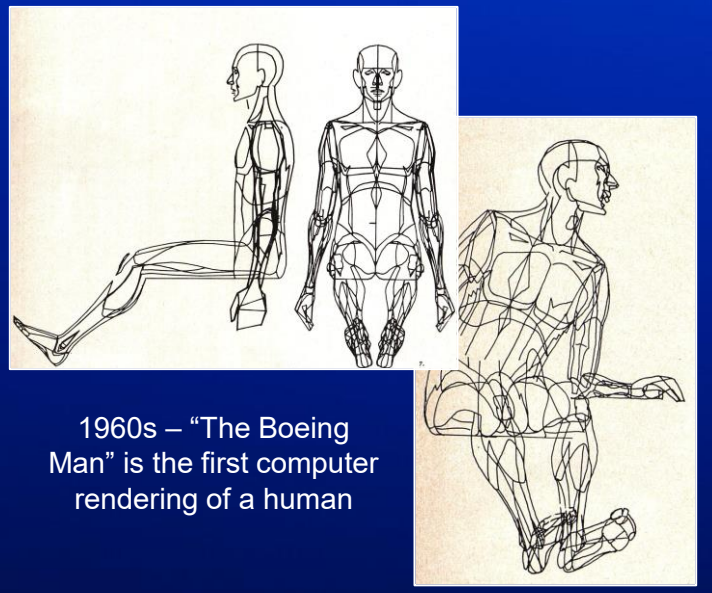
History of Artificial Intelligence at Boeing

1940s – Boeing Electro-Mechanical Analogue Computer (BEMAC)



1940s – Boeing Electronic Analogue Computer (BEAC)

1950s – Floating bearing hard disk drive



1960s – "The Boeing Man" is the first computer rendering of a human

1964 – Boeing created the world's first digital human figure

1964 – Computer Graphics coined by Boeing

1982 – Boeing established the first AI research group in the industry

1990 – Augmented Reality coined by Boeing

2004 – Airplane Health Management launched

2017 – Boeing AnalytX Platform

2020 – Safety Analytics supporting the SMS

2021 – Runway Excursion causal factors (ML)

2025 – Boeing AI launched

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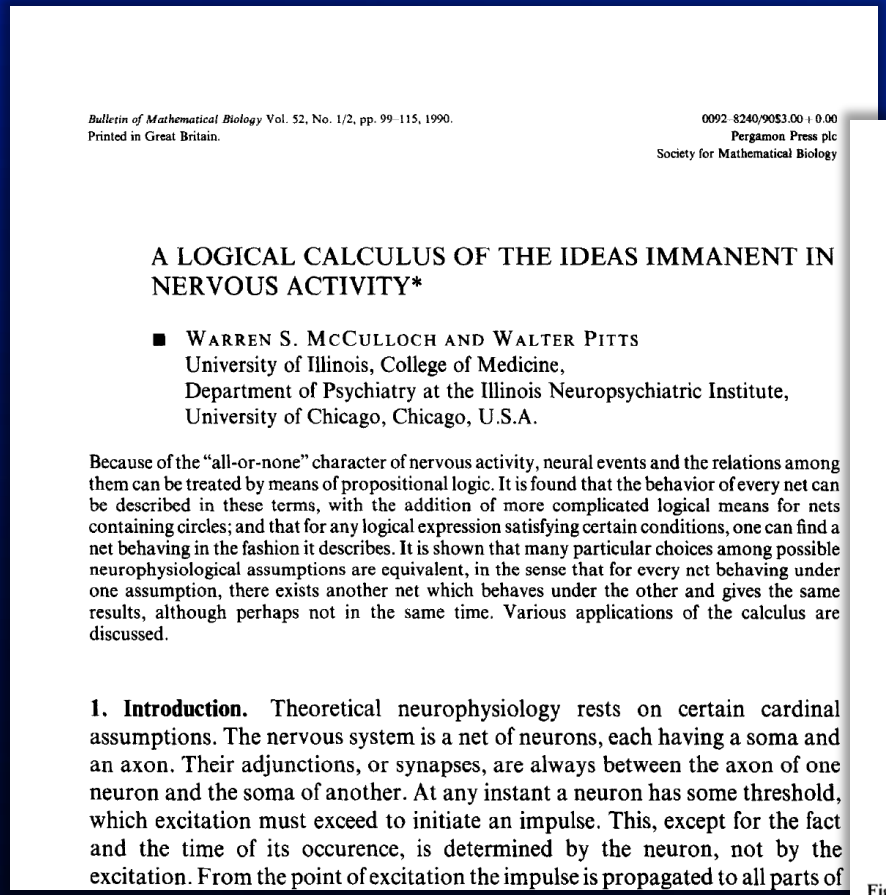
Early Artificial Intelligence

"It is customary to offer a grain of comfort, in the form of a statement that some peculiarly human characteristic could never be imitated by a machine. I cannot offer any such comfort, for I believe that no such bounds can be set."

—Alan Turing, 1951

First paper on Neural Networks – 1943



Bulletin of Mathematical Biology Vol. 52, No. 1/2, pp. 99–115, 1990.
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Pergamon Press plc
Society for Mathematical Biology

A LOGICAL CALCULUS OF THE IDEAS IMMANENT IN NERVOUS ACTIVITY*

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Because of the "all-or-none" character of nervous activity, neural events and the relations among them can be treated by means of propositional logic. It is found that the behavior of every net can be described in these terms, with the addition of more complicated logical means for nets containing circles; and that for any logical expression satisfying certain conditions, one can find a net behaving in the fashion it describes. It is shown that many particular choices among possible neurophysiological assumptions are equivalent, in the sense that for every net behaving under one assumption, there exists another net which behaves under the other and gives the same results, although perhaps not in the same time. Various applications of the calculus are discussed.

1. Introduction. Theoretical neurophysiology rests on certain cardinal assumptions. The nervous system is a net of neurons, each having a soma and an axon. Their adjunctions, or synapses, are always between the axon of one neuron and the soma of another. At any instant a neuron has some threshold, which excitation must exceed to initiate an impulse. This, except for the fact and the time of its occurence, is determined by the neuron, not by the excitation. From the point of excitation the impulse is propagated to all parts of

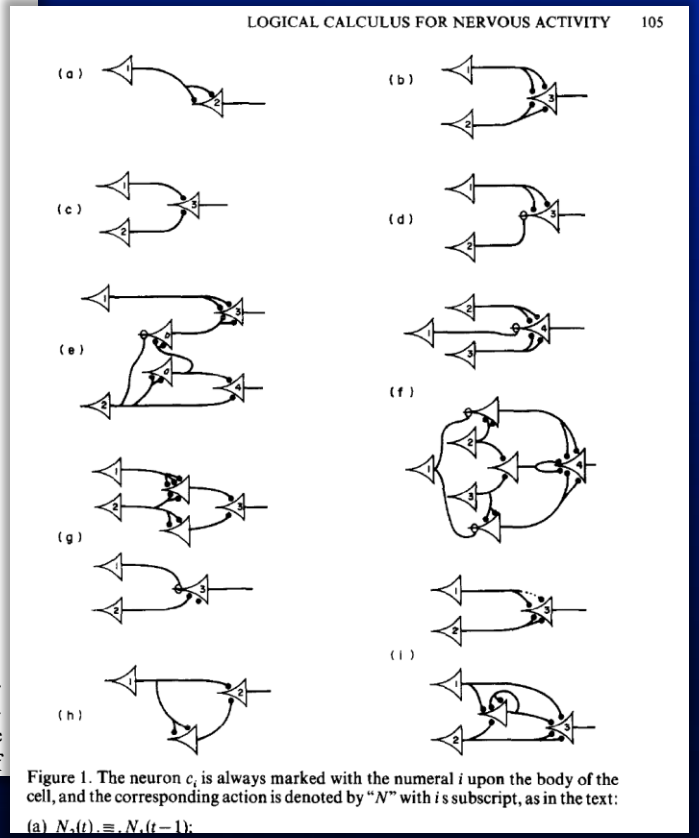

Figure 1. The neuron c_i is always marked with the numeral i upon the body of the cell, and the corresponding action is denoted by "N" with i s subscript, as in the text:
(a) $N_2(t) \equiv .N_1(t-1)$;

Source: Carnegie Mellon University

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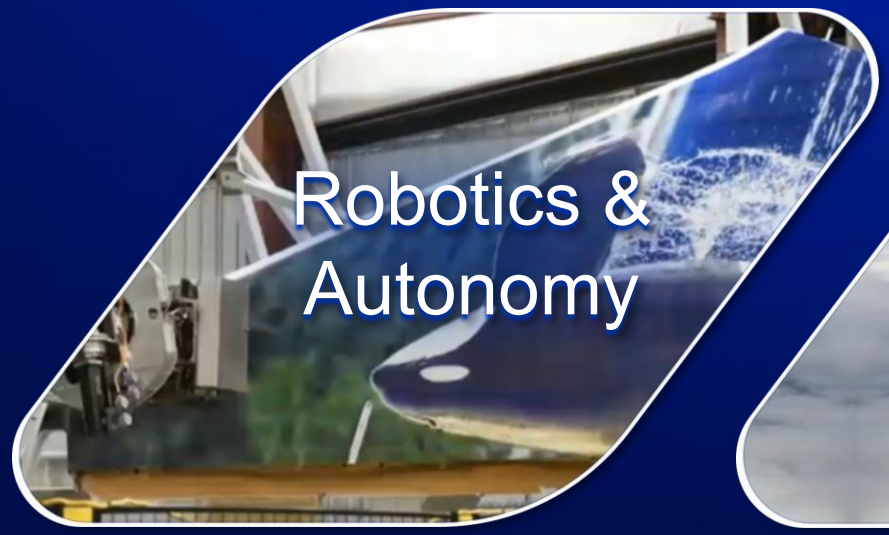
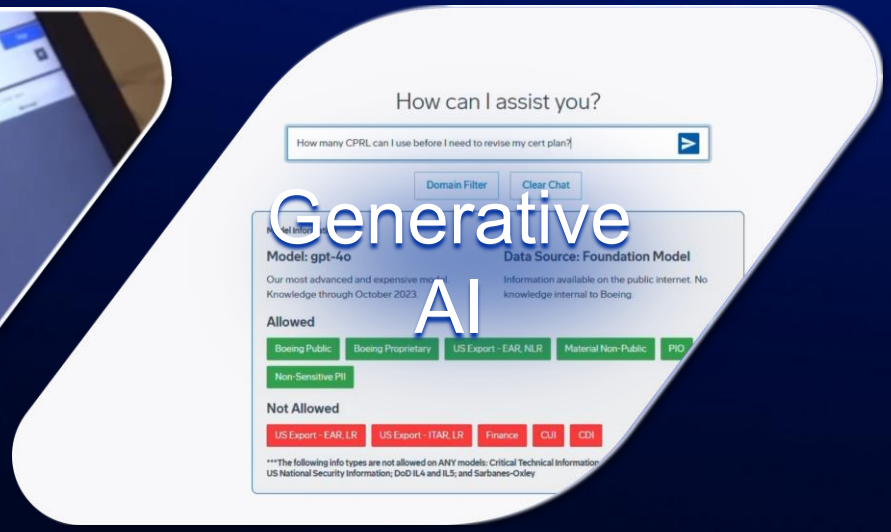
Boeing AI Focus Areas





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Auto Taxi Using Computer Vision and AI

Safe Runway – Small Object Detection

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Product Safety & Quality

Parts Accuracy Using AI

Quality Inspection Using AI

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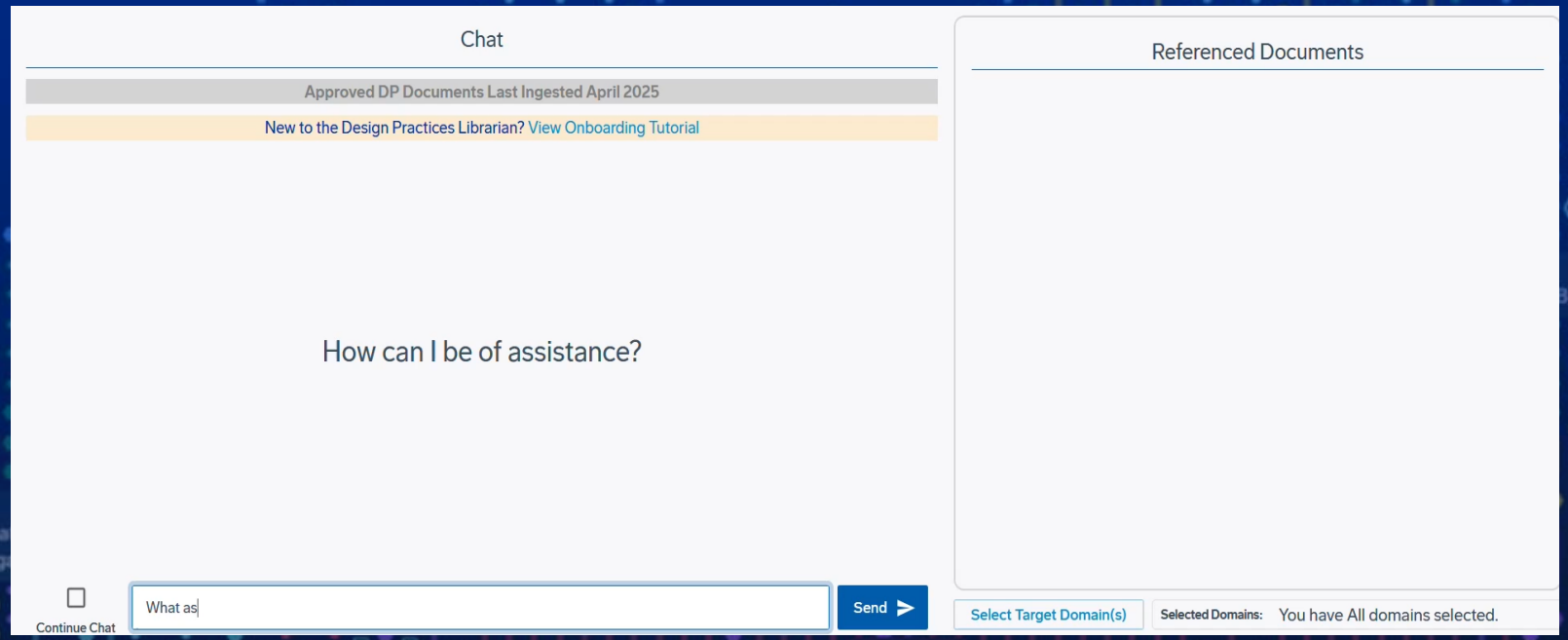
Using AI to Connect Design Practices & Safety Events



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AI Assistants

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AI Assistants

Certification Process Assistant

Users: Boeing Engineers and Subject Matter Experts

Problem: Certification process has inherent ambiguity and complexity

Value:
- **Saved time**
- **Reduced hours**
- **Improved drafts**

Enterprise Safety Data Analytics

Certification Plan Search Tool

Routing & Change Classification Assistant

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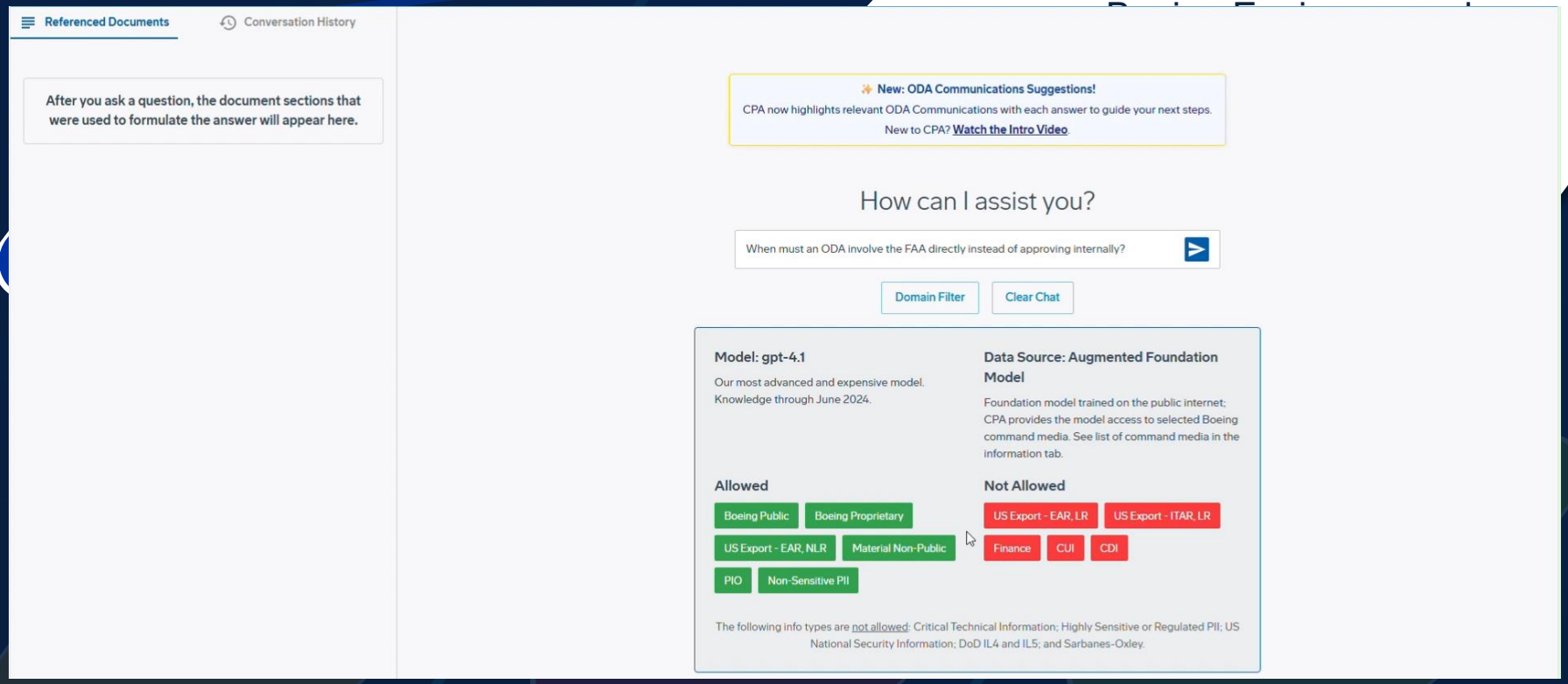
AI Assistants



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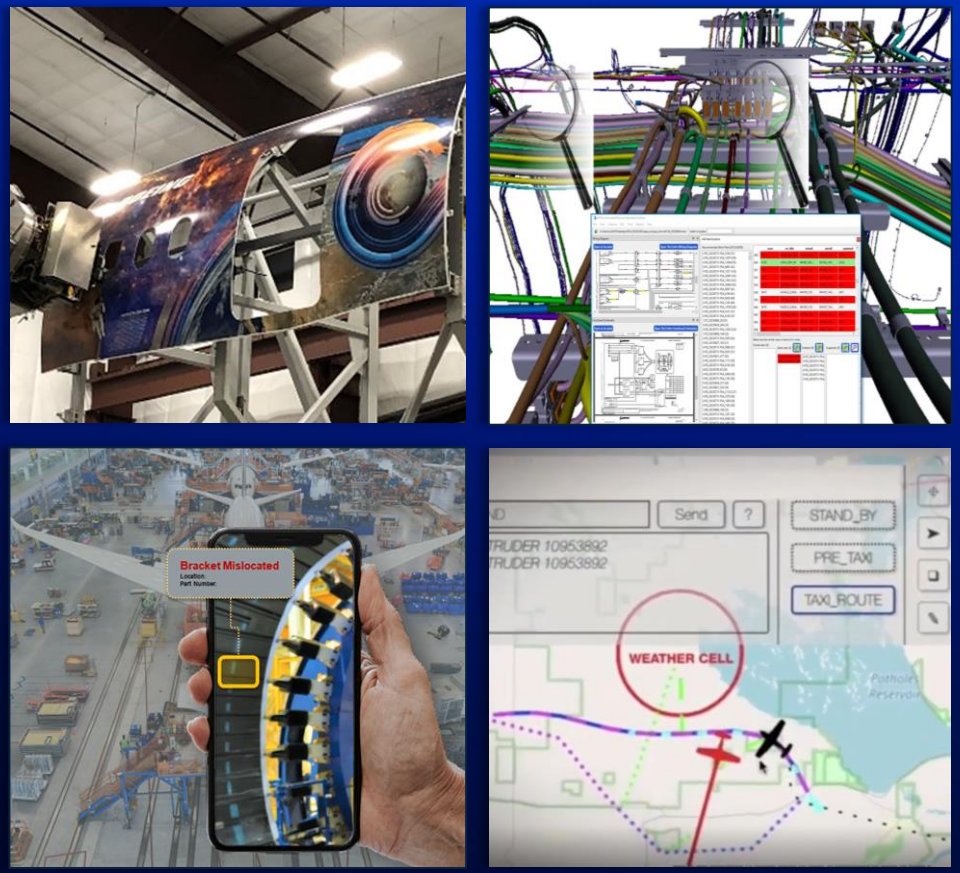
What we have learned

- AI systems have to work in the real world
- Normal behavior vs. consequences of failure
- AI systems need to be modular
- Reasoning is essential
- Dealing with known unknowns and unknown unknowns
- Human factors



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