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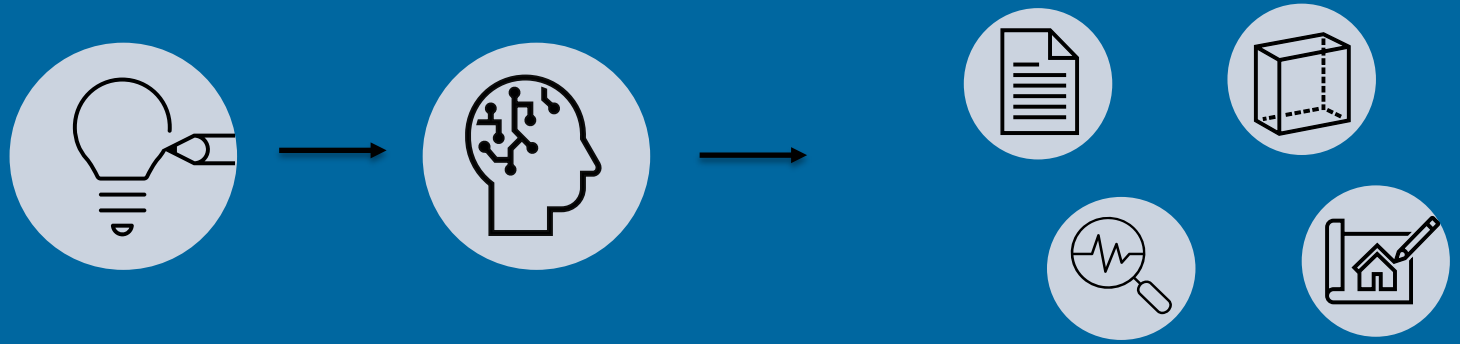
ARTIFICIAL INTELLIGENCE IN AE FIRMS



Topics

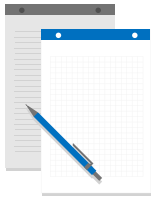
How AE firms are using AI

Legal Landscape

Risks and Opportunities

AI Definitions

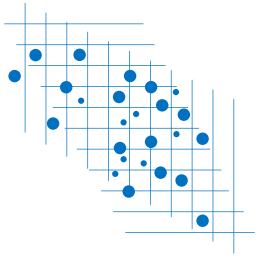
How AE firms are using AI



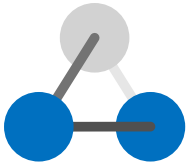
Design Automation

Conversational AI

Generative AI



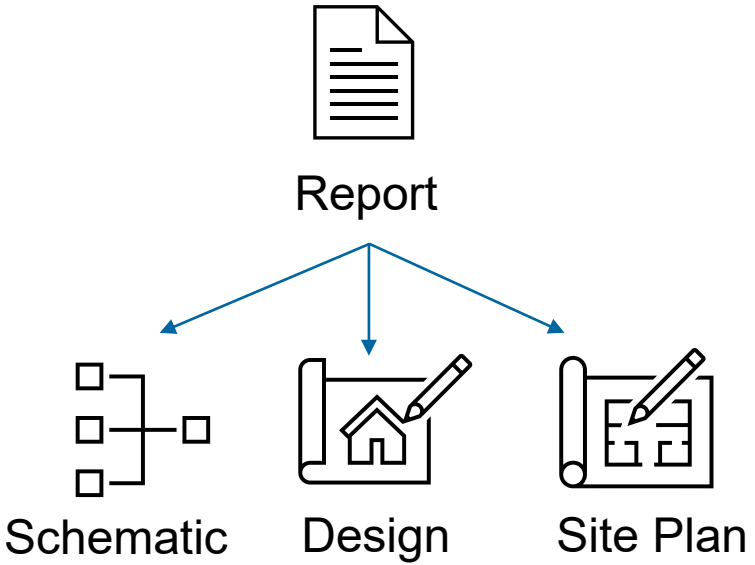
Predictive AI



Object Recognition

How AE Firms Are Using AI – Design Automation

Water and Wastewater Treatment Facility Design



- Many options per design
- Multiple documents created
- Engineer can create more design concepts for customer
- Includes costs for planning
- Engineer can evaluate more options and scenarios

Transcend Design Generator

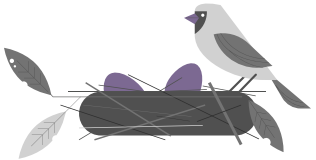
How AE Firms Are Using AI – Design Automation

Conceptual Renderings

- Provide AI framework rendering request
- Provide qualifications and expand on qualifications
- Can use for inspiration
- Explores feasibility of ideas
- Visualizes ideas

DALL-E, Midjourney

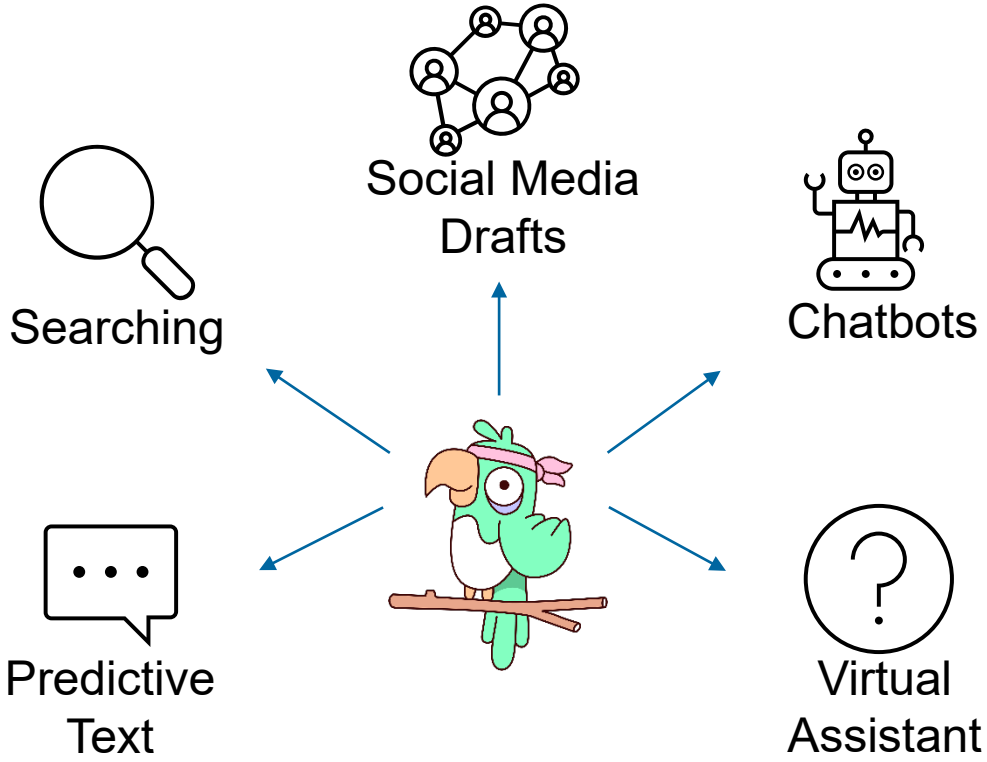
Bird



Bird in Nest

Abstract Bird

How AE Firms Are Using AI – Conversational AI



How AE Firms Are Using AI – Generative AI

General

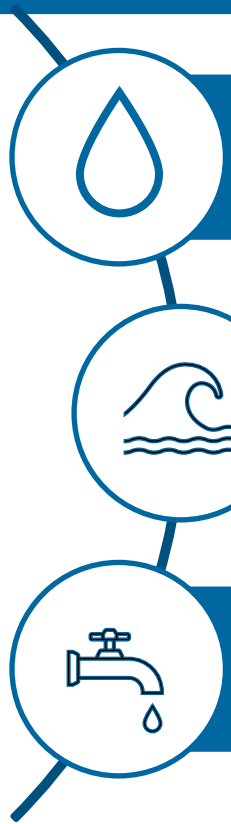
- Smart searches
- Transforms content
- Uses all information provided
- Create proposals and presentations
- Pull data from different sources on one topic

Request For Proposal (RFP)

- Import and export RFPs
- Suggest answers
- Customizable content library
- Content freshness controls
- Create and assign tasks
- Project oversight and tracking

Microsoft Copilot, Claude, Loopio

How AE Firms Are Using AI - Predictive AI



Predict changes in water use

Use reservoir levels, public data

Visualize scenarios affect on cost/revenue

Risk modeling

Capital planning

Leak monitoring

Model Water Distribution systems

Determine feasibility of new buildings

wsOneWater, Voda.ai, ArcGIS, InfoWater

How AE Firms Are Using AI - Object Recognition

Manholes

- 360 video of manhole
- CCTV of pipe
- Code defects

Digital Twins

- Use aerial, streetscape, or indoor imagery
- Create digital twin with Lat/Long
- Analyze assets

Photos

- Identify objects in photos
- OCR
- Tags
- Search

SewerAI, GeoCam, OpenAsset, PowerAutomate, vHive, ArcGIS

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Legal Landscape

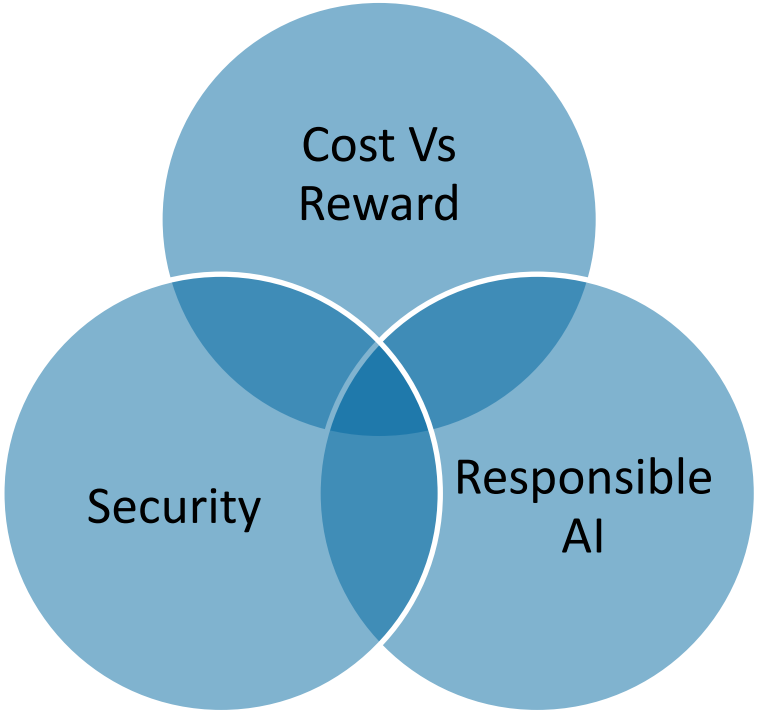
Best Practices

- Responsible for output
- Review and own quality
- Modify to effect tone and brand
- Better the parameters, better the output
- No private data

Legals

- Have an AI Policy
- Risk of copyright infringement
- Only humans can be authors
- Output must be changed to be owned
- Fact Check

Risks and Opportunities



Model evaluations: Alignment Research Center

AI Definitions

Conversational AI- uses NLP to create human like conversations

Deep Learning – models the brains neural network using multiple layers

Digital twin – Virtual representations of physical objects

Generative adversarial networks (GANs)– creates outputs and judges it based on real life information

Generative AI – Creates new content
using patterns from training data and GANs. Can create text, music, images, and video.

Large Language Model (LLM) – Model with very large amount of parameters

Machine Learning

Machine Vision – Using computers to “see”

Model Evaluation & Threat research (METR) is non profit that assesses if AI systems pose a threat. Currently working with Anthropic and OpenAI to evaluate their systems.

Natural Language Processing (NLP) – The branch of AI that attempts to understand text and spoken language.

Optical Character recognition (OCR) – Pulling text from images

Transformer model – Using a neural network, the model uses the proximately of words to learn language context.

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QUESTIONS

thank you

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