AI - Implications for Pensions

PSLA Talk 2025

Sam Barton

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I'm Sam

I've worked in software engineering for >25 years with a focus on start ups and taking new ideas to market.

Started with my own digital agency and then moved to ecommerce where I worked for 10 years as **CTO at ArenaFlowers** + had my first taste of AI in preventing fraud.
CTO at Smart Pension. Launched in 2015, to £15 billion in AUM, delivering for more than 1.6 million people in the UK alone, and hundreds of thousands of customers across the globe.

CTO at Blackfinch Investments Limited
Blackfinch provide a host of investment products such as IHT, EIS, VCT, as well as Energy and Property and Asset Management and Ventures. We also incubate our own start ups - some of which I will share today.

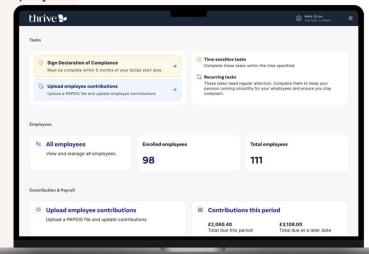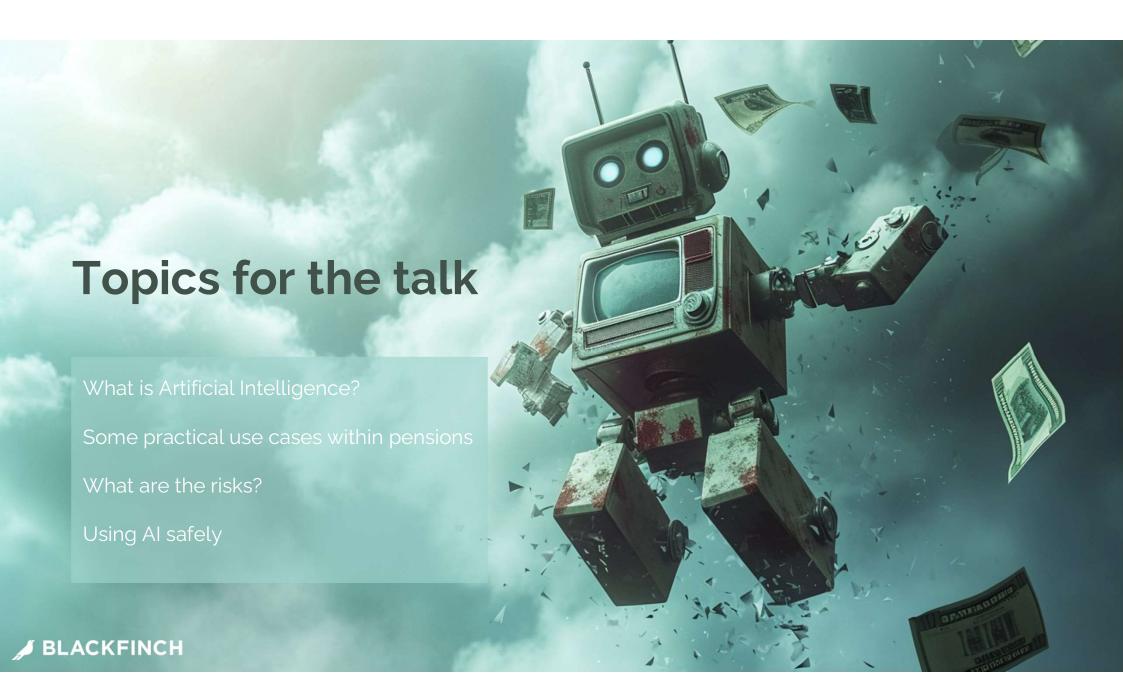**Let's get into the talk**

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Thrive is an all-in-one solution that guides employers and employees on their journey towards financial empowerment.

By simplifying pensions, benefits, and financial education, Thrive equips employees with the tools, clarity, and confidence they need at every stage of their financial lives. Our easy-to-use platform makes pensions, benefits, and financial education accessible, helping employees feel secure and informed.
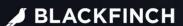
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Topics for the talk

What is Artificial Intelligence?

Some practical use cases within pensions

What are the risks?

Using AI safely

What is AI?

In a nutshell, it is a computer performing a task that would ordinarily require human intelligence to complete.

AI comprises many different fields of science, each one nested beneath another as they get more targeted to the task at hand. This nesting is often referred to as the **Russian Dolls of AI**.

But let's look at what we THINK AI is...

What we think AI is

The movies like to illustrate AI as more sentient, such as the Terminator or Hal, from the film 2001 A Space Odyssey.

Strong AI

But despite recent developments, we're not there yet. These much more cognisant forms of AI are known as Strong AI.

If Google Maps could drive you home and make you a cup of tea at the same time we'd all be using Strong AI*.

Even that is subjective as it could be a combination of many forms of narrow AI

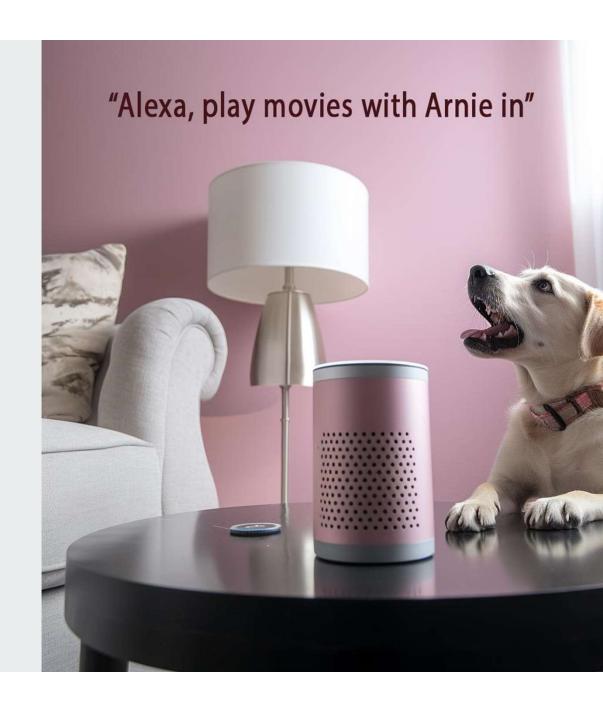**BLACKFINCH**

What AI actually is

So today you are likely using different forms of Weak or Narrow AI.

Narrow AI

Alexa here is an examples of Narrow AI but so are self driving cars. They are Narrow in the sense that they do one thing very well.

This applies to **ChatGPT** and other **Generative AI** tools as well.

Narrow AI can do one thing very well, vs many things at the same time. *Using a.I. I have created all the images in this deck using a Gen AI tool*

"Alexa, play movies with Arnie in"

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Russian Dolls of AI

So knowing that ChatGPT is a form of narrow AI, let's take a look at how it fits inside our nested Russian Dolls.

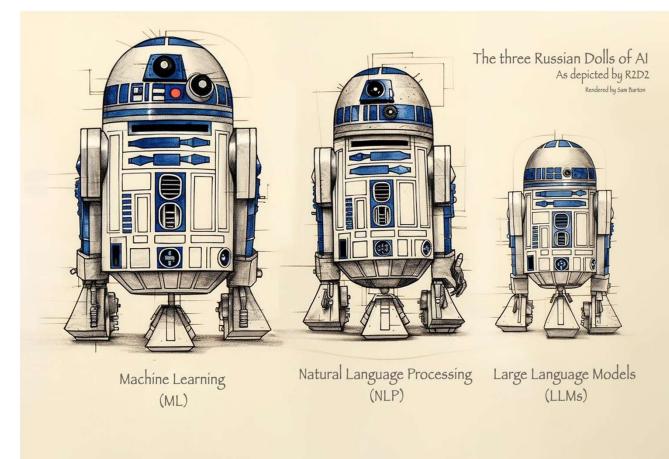I like using R2D2's as my Russian dolls:

Doll 1: Machine Learning (ML),
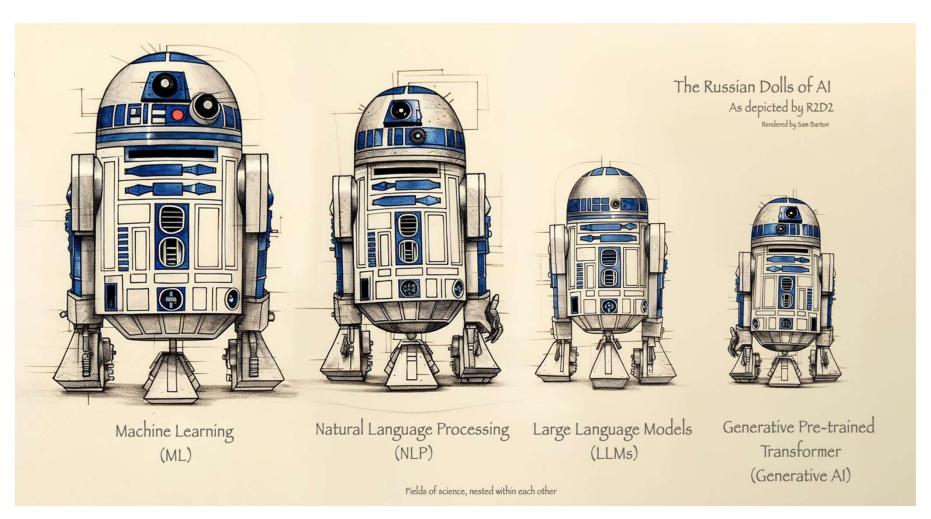**Doll 2:** A subset of ML is Natural Language Processing (NLP).
Doll 3: Language Models (LLMs) which are a subset of NLPs.

The three Russian Dolls of AI
As depicted by R2D2
Rendered by Sam Barton

Machine Learning
(ML)

Natural Language Processing
(NLP)

Large Language Models
(LLMs)

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The Russian Dolls of AI
As depicted by R2D2
Rendered by Sam Barton

Machine Learning
(ML)

Natural Language Processing
(NLP)

Large Language Models
(LLMs)

Generative Pre-trained
Transformer
(Generative AI)

Fields of science, nested within each other

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Now we understand how AI falls into different fields of science, let's take a look at some worked examples.

Podcast

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So how did these two have a chat about an article I wrote?

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1. **Upload the Article**

   Google Docs, PDFs, web pages, blog posts etc.

1. **Content Processing with Gemini AI**

   Google's Gemini language model summarises and synthesises the content to generate a coherent script.

1. **Script Generation for Dual Hosts**

   NotebookLM creates a conversational script designed for two AI hosts

1. **Text-to-Speech Conversion**

   The script is converted into audio using advanced text-to-speech technology, producing natural-sounding voices for the AI hosts.

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NotebookLM

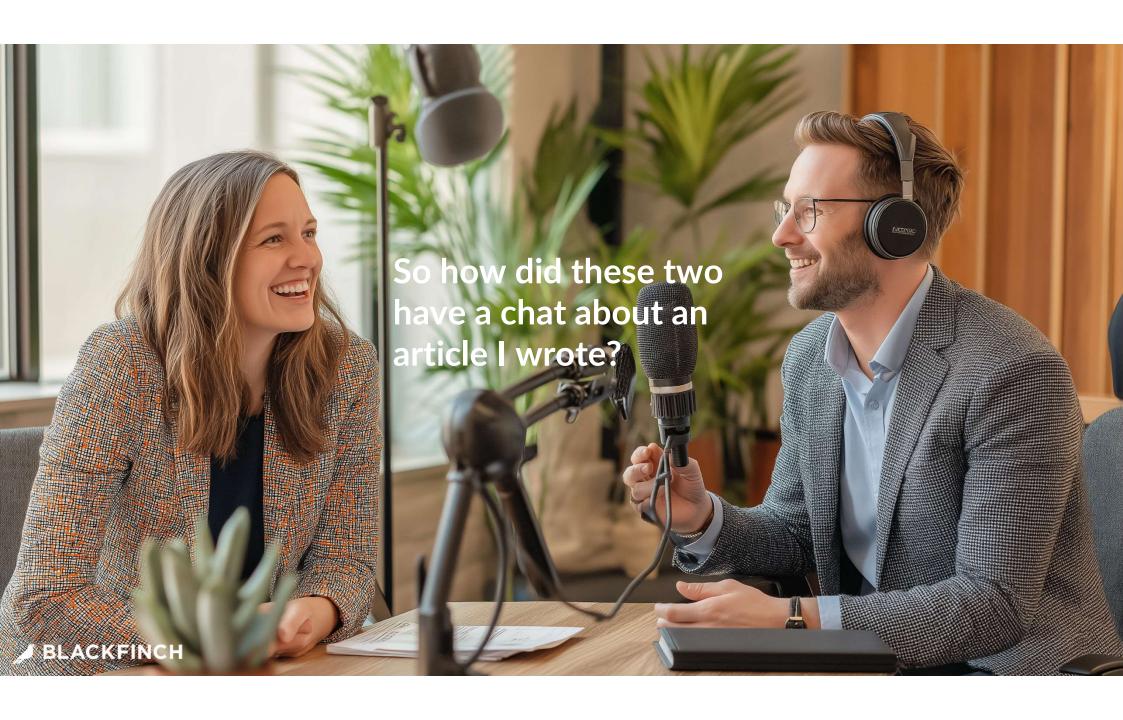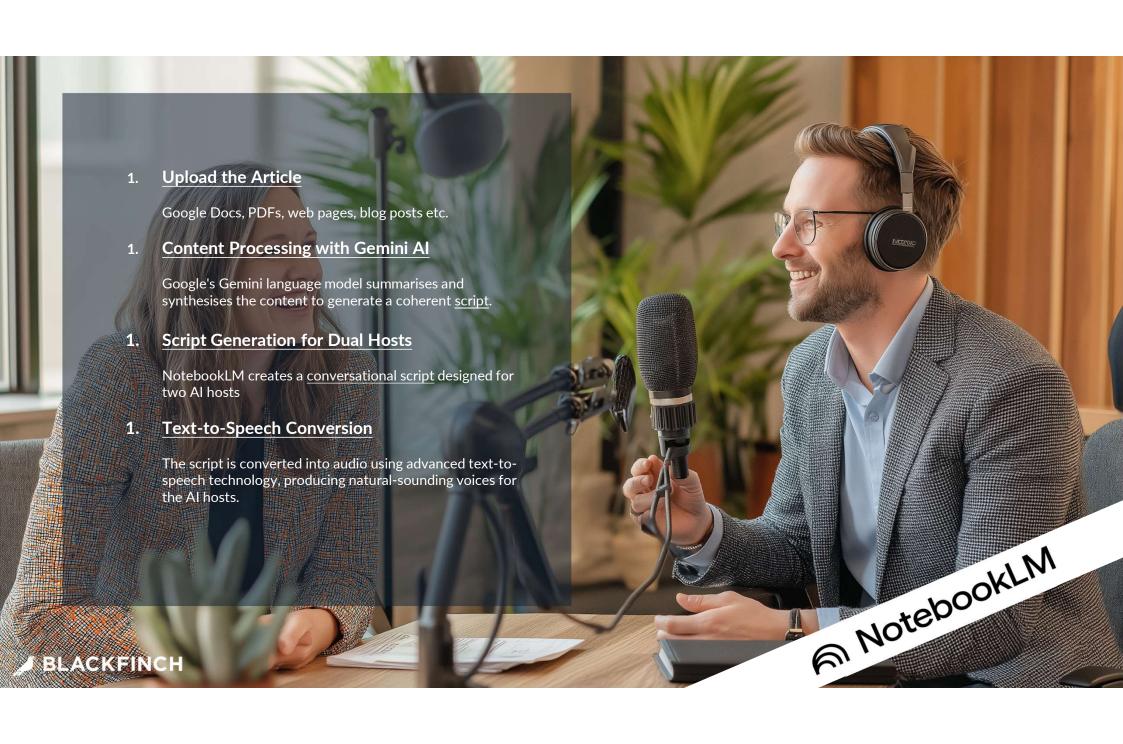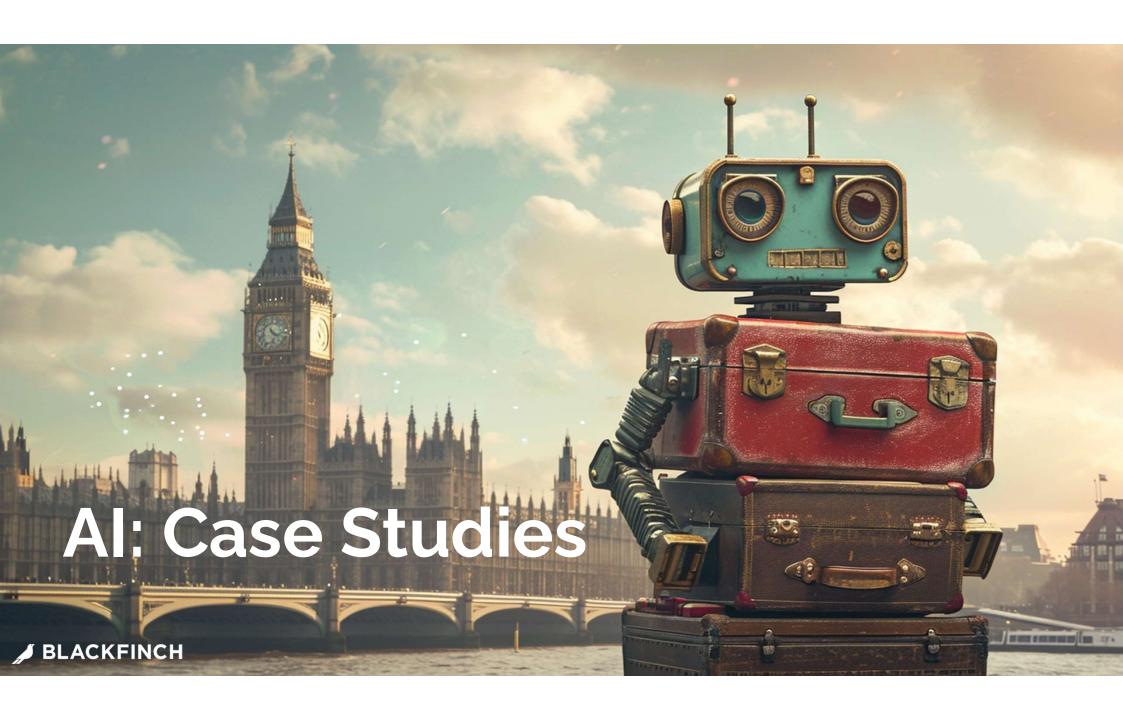# AI: Case Studies

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Forecasting Contributions

This was initially an experiment with a member of the DS team during lockdown.

Customers assumed that a 'Smart' pension did exactly this so we came up with an algorithm using linear regression and then a model that was trained with decision trees. It was accurate, but not penny perfect.

Iterating on the model
It has since been improved and productionised. The service has access to anonymised contributions data. The data is scanned at company level (GridsearchCV), this first pass picks the relevant forecasting model to use based on attributes of the data.

Use cases are broad. This is actively used in Ops for compliance monitoring as well as retention or pricing of large clients. It could also be used as a customer facing alert to warn of gaps in contributions.

Ⓜ *Machine Learning*

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Tell me about my pension?

Coming soon!

Chat bot inside Thrive

Examples

- Ask Penny how much is in your pension or what compounding means
- FAQs that are read out to you
- Book a coaching session
- Useful for people who are new to financial planning
- A means to make financial information more accessible (those with disabilities, but also to a generation who consume content differently).

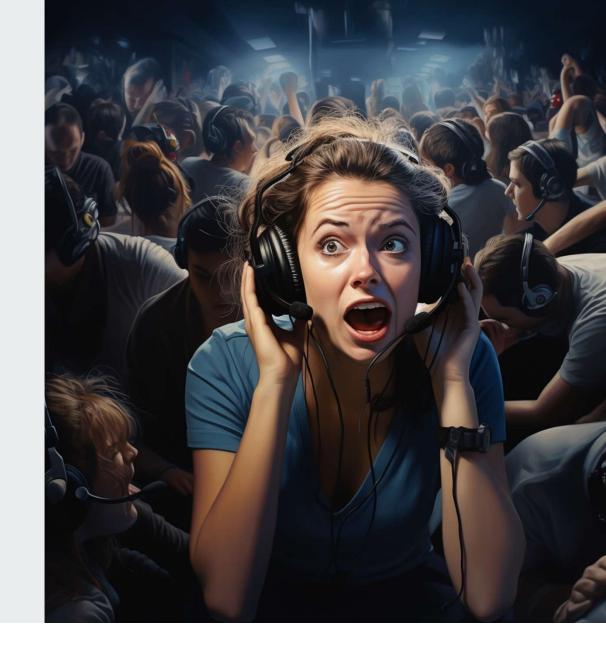**G** *Generative AI*

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Topic Modelling

A tool that groups clusters or groups of similar words in order to identify the sentiment or tone of the message from customers. Also known as **sentiment analysis**.

The data is unstructured and doesn't have tags to quickly filter by so an unsupervised model is used to mine the data.

Examples

This enables the Ops or contact team to proactively reach out to customers who look like they have growing concerns, get a general feel for current satisfaction and add to customer retention metrics.

M *Machine Learning*

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Investment Monitoring

The Keystone investment systems are fully automated, true end to end processes are in place for reconciling payment, portfolios and trading and investment instructions. So no room for human error.

But this doesn't stop things going wrong. Monitoring is always needed and this helps power that monitoring.

Anomaly detection

Anomaly detection is the identification of patterns or instances that deviate significantly from the norm or expected behaviour within a dataset.

The model is trained on millions of historic records and is able to pick out anomalies or outliers that appear suspicious against normal behaviour and allow the investment team to manually investigate.

M *Machine Learning*

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GitHub CoPilot

My favorite form of Gen AI. Microsoft acquired Github, which is a popular code repository. This tool is an extension of Microsoft Copilot, but trained against code and is designed to help engineers be more efficient with their work.

It's a tool that works inline with your code, but also has chat capability. Much like ChatGPT.
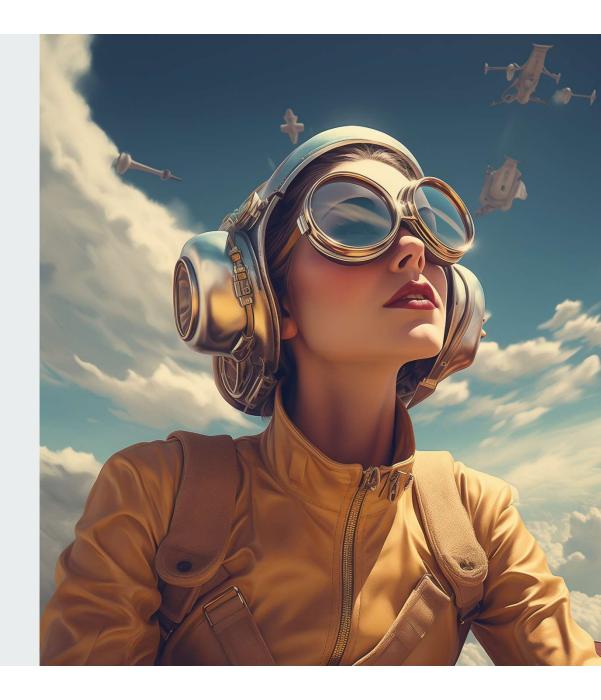
Examples

It's very powerful when used with common structures. E.g. it is very good at writing unit test coverage for existing code and following an existing standard. I found it was good at writing SQL and could optimise complex queries.

It wasn't perfect though, as with any coding the output needs reviewing by a human (PR/QA/UAT etc). **We've seen it make up stuff as well.**

Link to a post I wrote on this topic.

G *Generative AI*

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Customer Segmentation

A bespoke model designed to improve engagement with members. The tool creates a test and control group following patterns that identify likely candidates for communicating with.

The objective is to help the marketing team create more effective campaigns.

Examples

- Transfer in
- Single premiums
- Percentage increase
- Etc

M *Machine Learning*

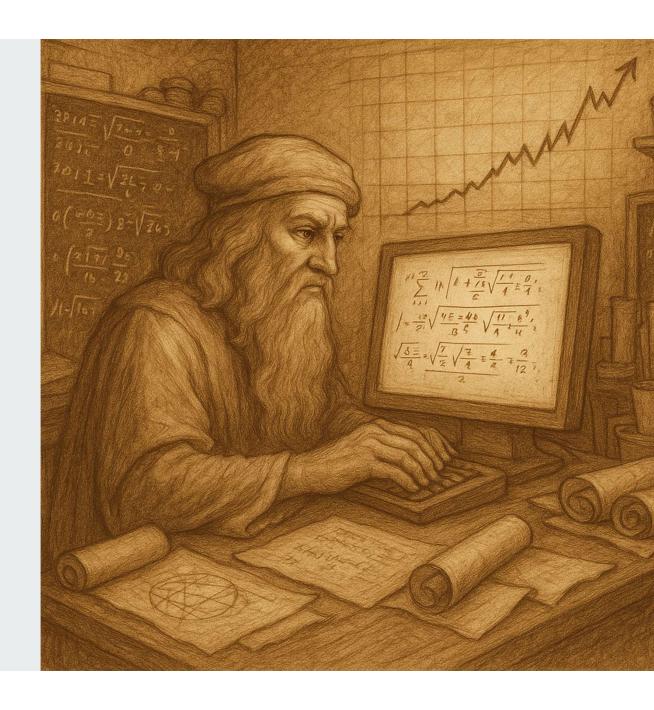**BLACKFINCH**

Retirement forecaster

Built in Chat GPT4

Examples

- Based upon SMPI
- Added State Pension
- Added open fields for other income
- Retirement age selector
- Generated a set of scenarios using a stochastic model.

G *Generative AI*

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I'd like to introduce you to a colleague of mine called Emma.
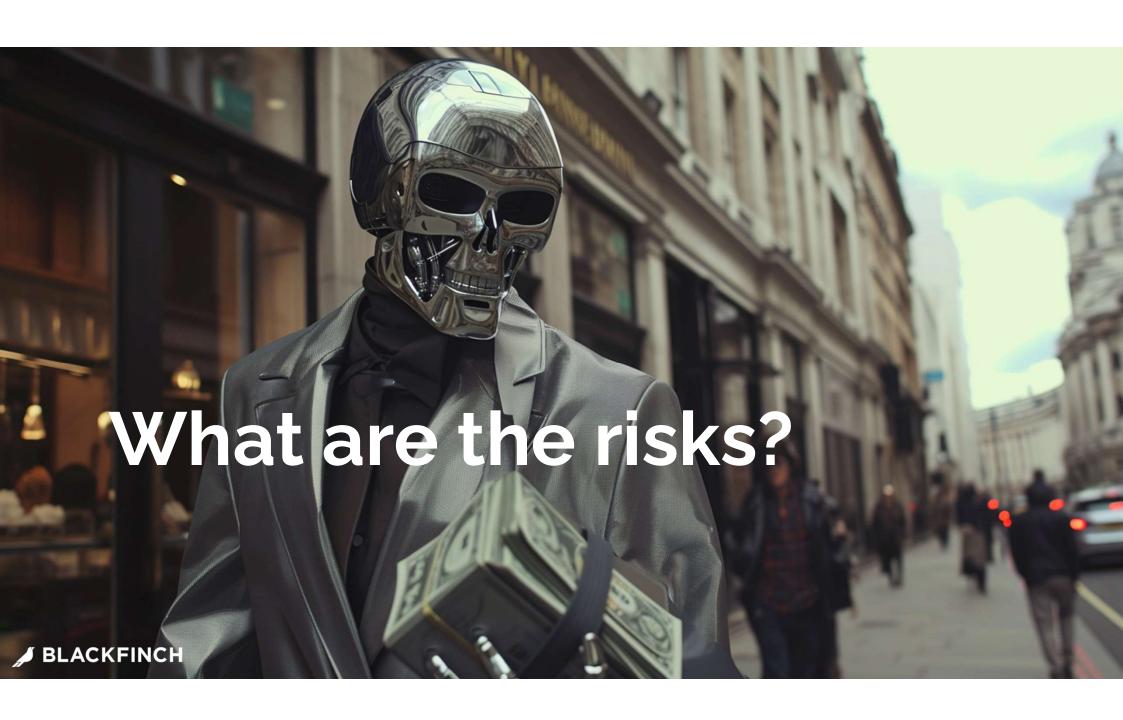
Emma was supposed to join me today, but she couldn't make it so will have to dial in.

Total pension balance
£32,458.73
View breakdown →

Boost your financial confidence in 1m
Explore our Academy now

Customise your pension

Monthly contribution
Choose how much of your monthly salary you contribute to your pension.

5% From your salary   +5% From your employer

Retiring at age 67
Choose the age you retire.

New features coming soon

Home   Pensions   Academy   Profile   More

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What are the risks?

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Lack of transparency   Security
Job automation and disruption   Deepfake
Legal and regulatory challenges Data Privacy
Unintended consequences   Biased algorithms
Ethical dilemma   Cost to serve
Bad training or design   Workplace culture risk

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Training data

Prompts used to make this image

Robot
Smartly dressed
Looking evil
City of London
Holding money
Great British Pounds

Fun image, but not accurate as those are USD's

Regardless of the AI model you are building, it's vital that the training data suits the intended outcome.

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Bias

An old, but gold example of bias in an AI model

Model designed to pick candidates for a role at Amazon. Based on the info in new CV's, the role description and past successful CV's

The issue was that past successful candidates were mostly men. The model was sexist!

What if the same issue applied to benefit statements?

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It's not always cheaper!

Compute power is high, pushing up the cost per transaction of services like live chat (Gen AI).

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So how do we use AI
without making
mistakes?

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Make sure your AI is properly trained

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Human review of the work is crucial

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Risk appetite

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Make sure the business case adds up

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Choose your path with AI

And we can all live happily ever after together
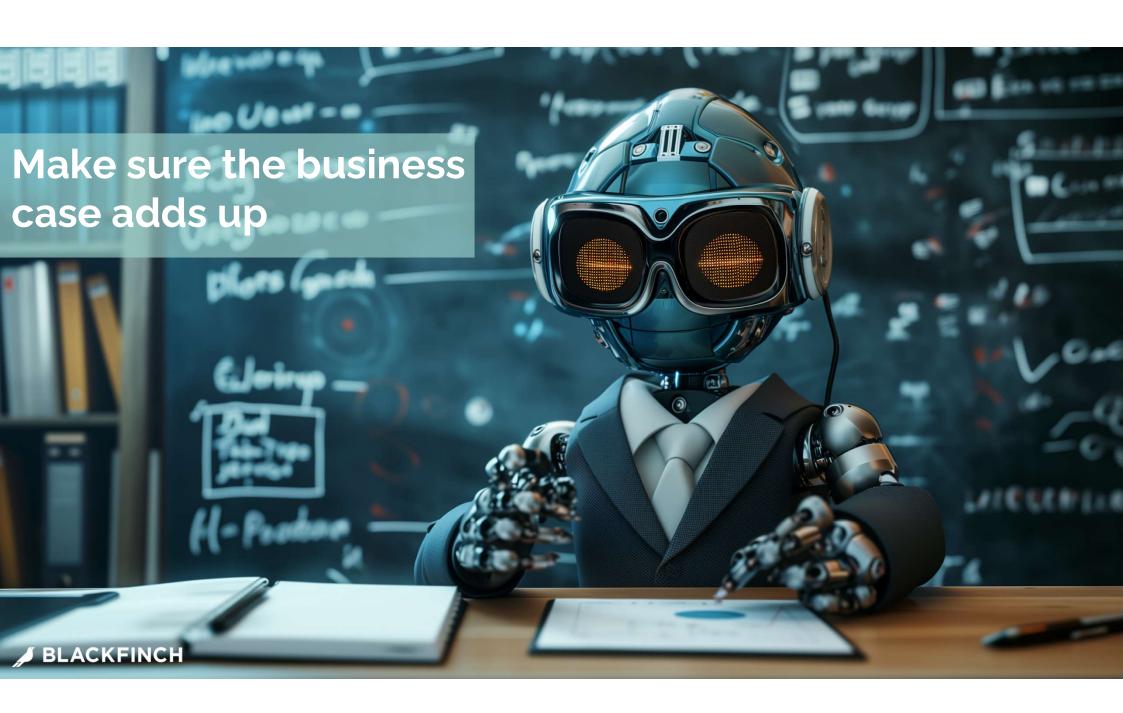
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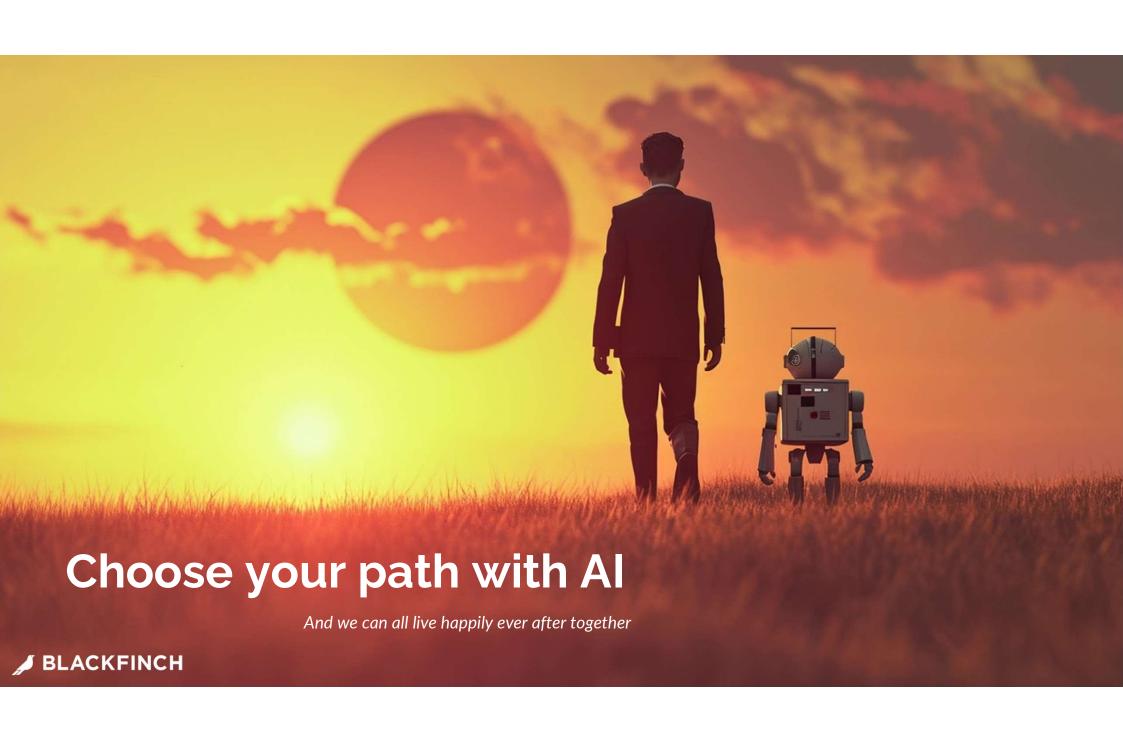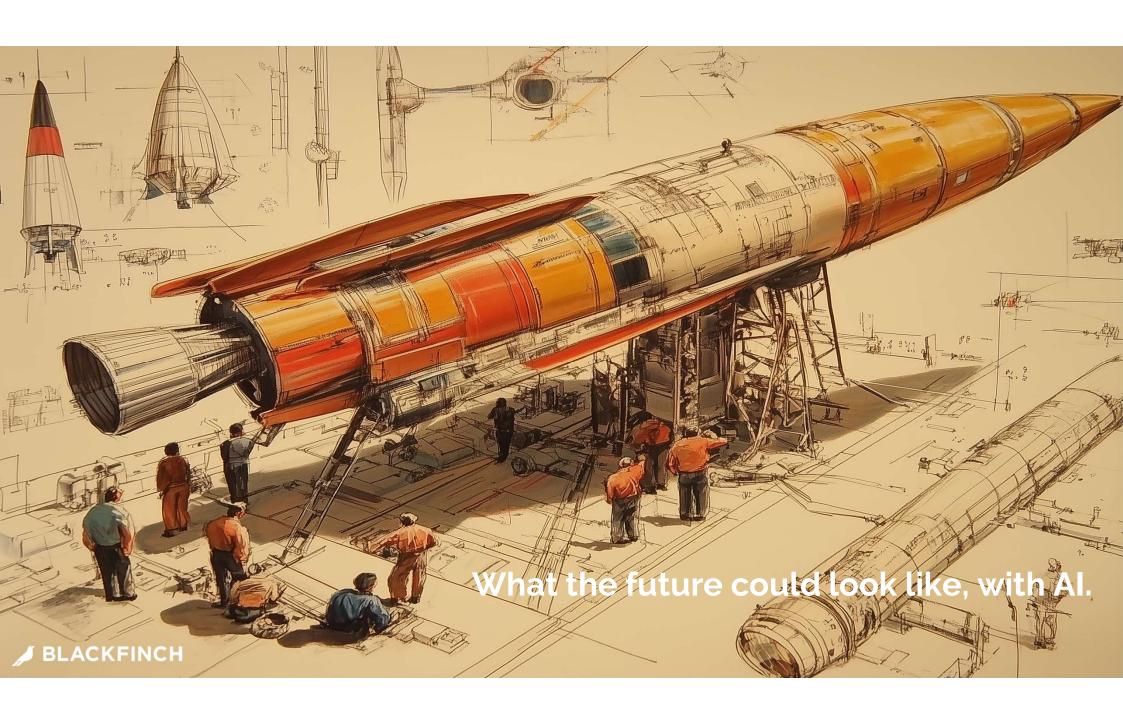
What the future could look like, with AI.

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Thank you.

I've been Sam Barton

... or have I?