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Transforming Life & Health underwriting and claims with generative AI

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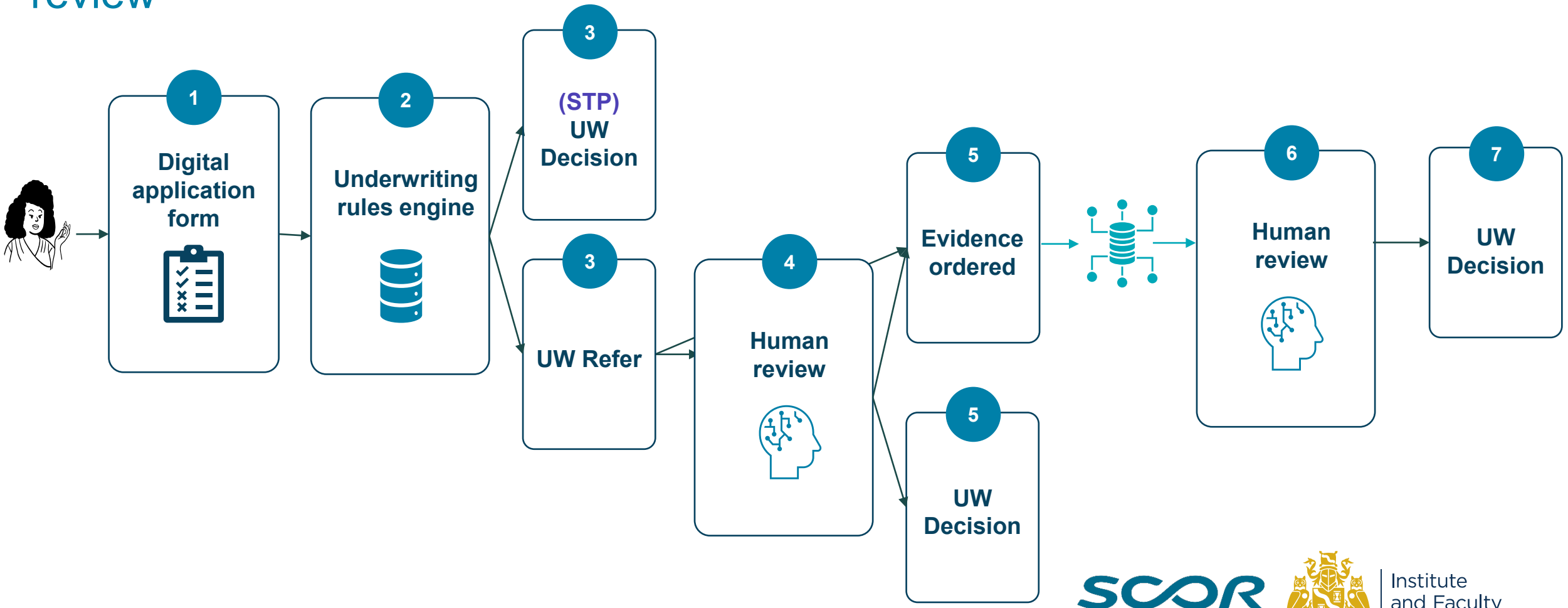
Current underwriting process

Underwriting journey

Majority of applicants are straight-through processed but ~30% need human review



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What is generative AI (Gen AI)?

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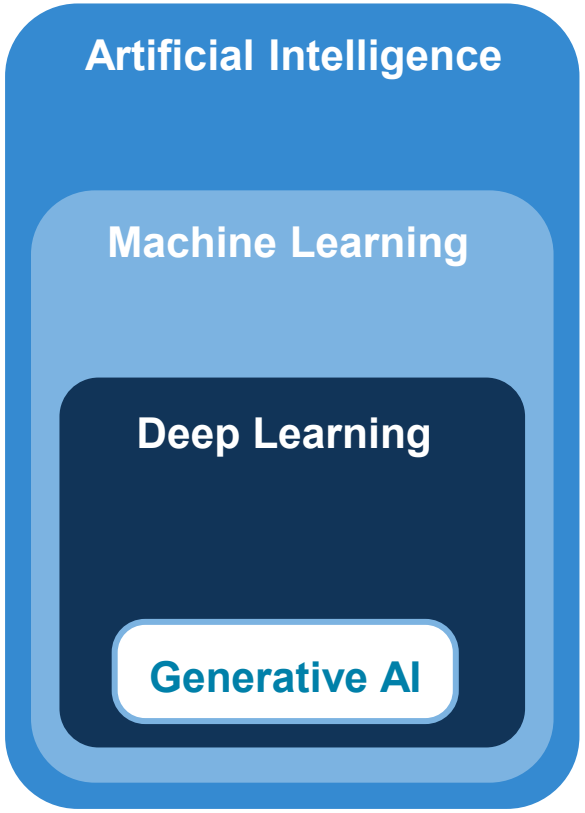
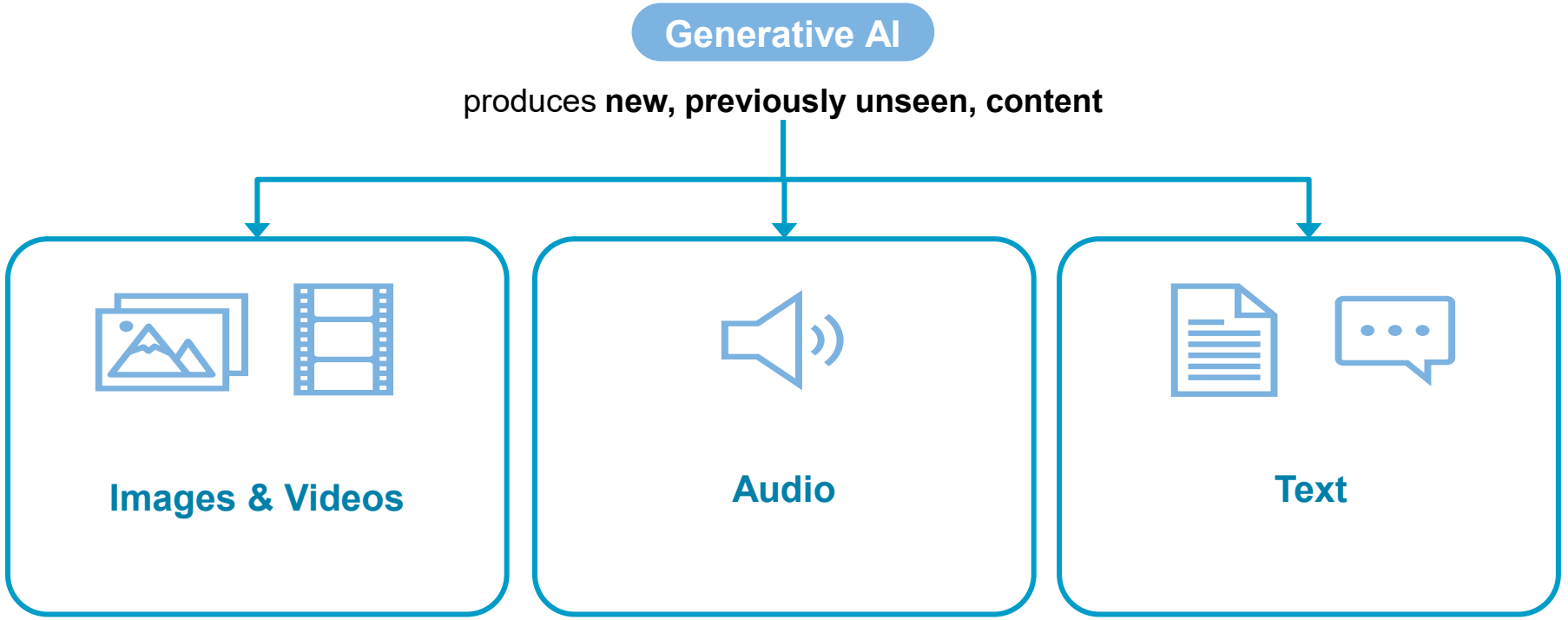
Context

The launch of Open AI's Chat GPT in November 2022 has highlighted the huge potential of Gen AI across a wide range of tasks





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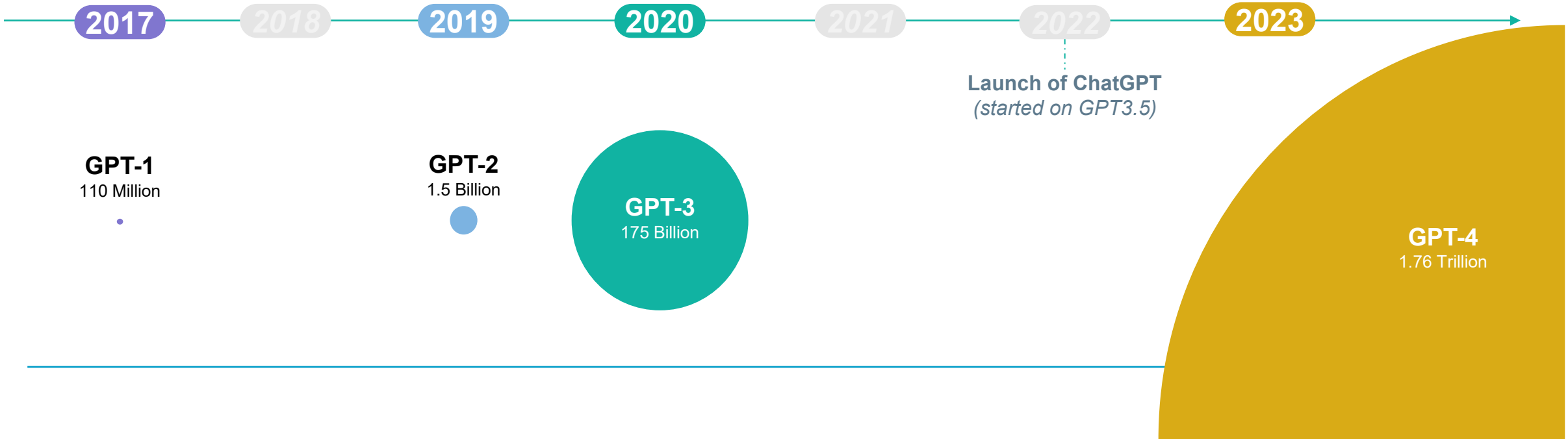
Context

Text is one of the main use cases, propelled by growing computing power and large language models (LLMs)

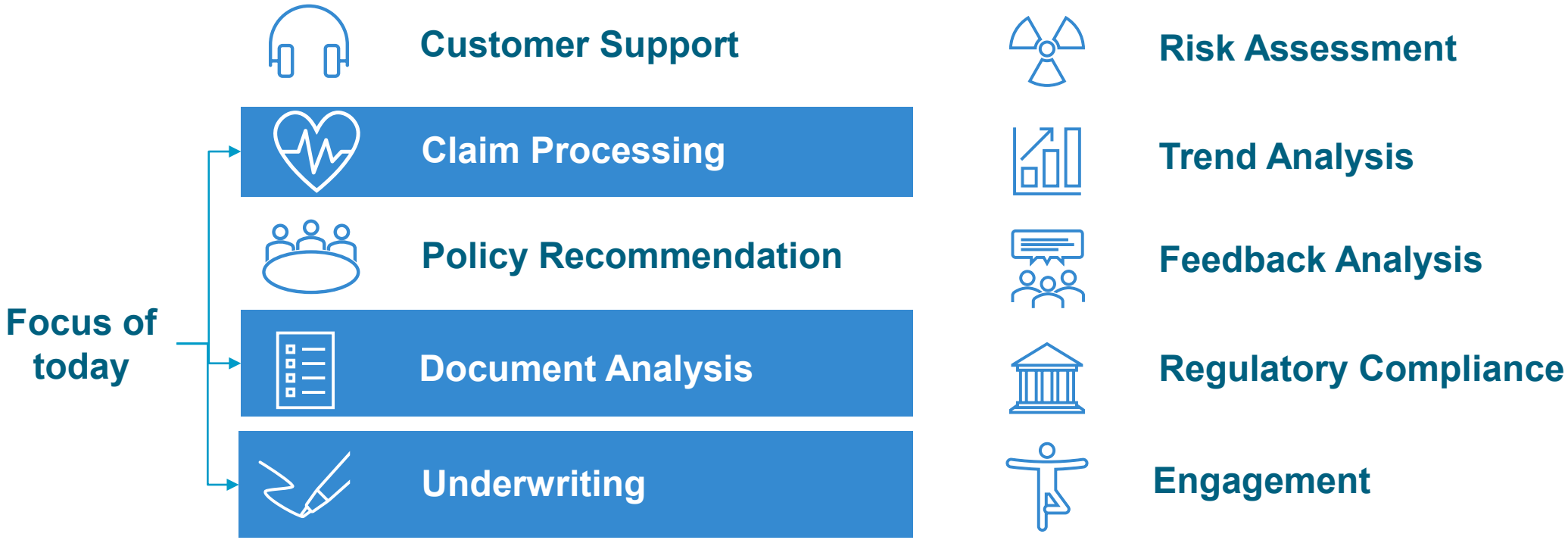
The models are not new – but the tech is now mature enough to turn them into truly powerful solutions, based on a wide range of parameters

Number of parameters of Open AI's GPT models



Context

Gen AI has the potential to power life & health (re)insurance use cases, across the whole customer journey



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How can generative AI help underwriting and claims processes?

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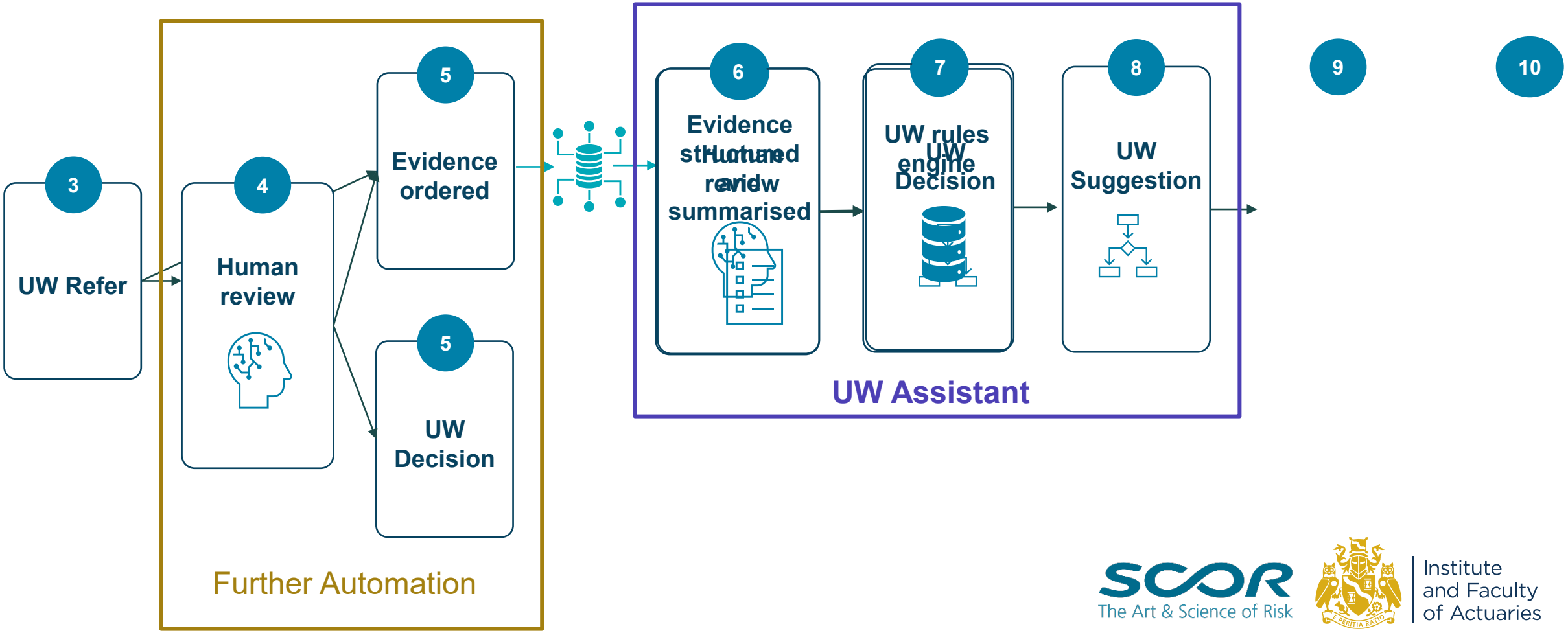
New Underwriting journey

The review of structured and unstructured evidence can be considerably quicker and *recommended* UW decisions returned for human review



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AIssistant | New document(s) | Open chat | Chris McCain

Summary | Details | Search details...

Pages of classifications

Cover sheet	1-3
Exams, Labs	5-10
ECG	16
GP reports	17-20
Misc. (handwritten etc.)	21-50

Personal information — Edit values

Name	Richie Williams
Date of birth	11/14/1962
Marital status	Married
! Policy number	Information not specified in provided documents

Impairments — Edit values

Heart and blood pressure issues	Hypertensive disease
! Mental health issues	Information not specified in provided documents
Cancer	Family history of breast cancer in sister
! Endocrine disorders	Information not specified in provided documents
Respiratory disorders	Asthma
! Gastrointestinal disorders	Information not specified in provided documents
! Marfan Syndrome disorders	Not implemented yet, please review — Open chat
! Brain or Nervous System Disorders	Information not specified in provided documents
! ENT issues	Information not specified in provided documents

Application_Richie.PDF
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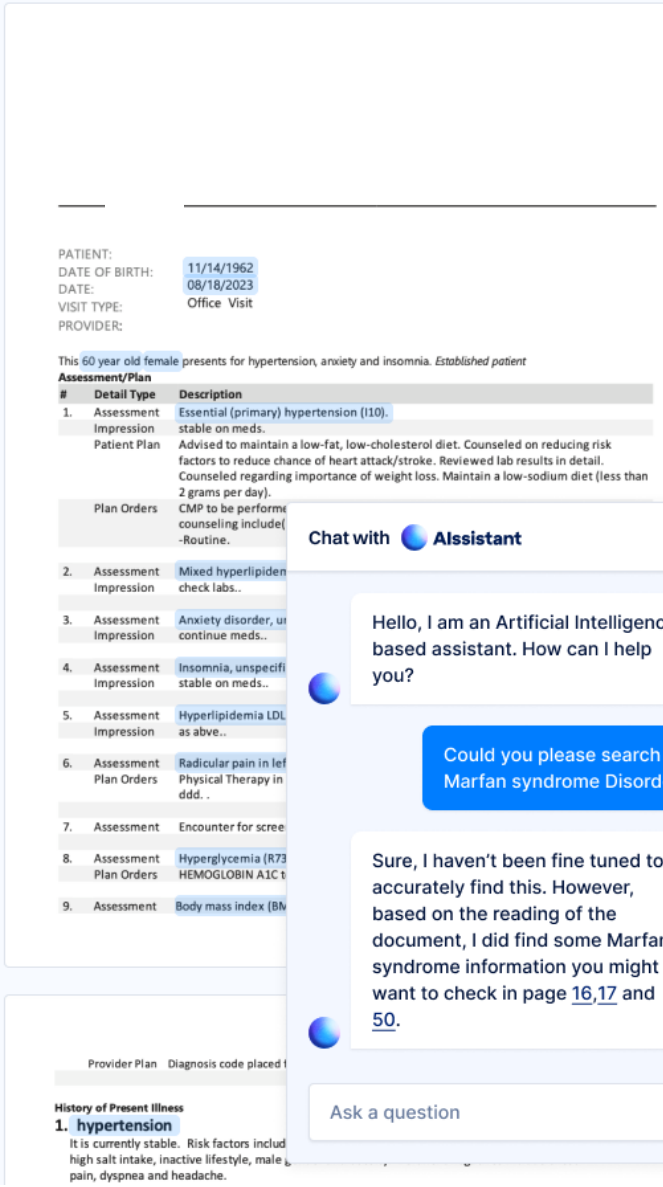
Application_Richie.P...


PATIENT:
DATE OF BIRTH: 11/14/1962
DATE: 08/18/2023
VISIT TYPE: Office Visit
PROVIDER:

This 60 year old female presents for hypertension, anxiety and insomnia. *Established patient*

Assessment/Plan

#	Detail Type	Description
1.	Assessment	Essential (primary) hypertension (I10).
	Impression	stable on meds.
	Patient Plan	Advised to maintain a low-fat, low-cholesterol diet. Counseled on reducing risk factors to reduce chance of heart attack/stroke. Reviewed lab results in detail. Counseled regarding importance of weight loss. Maintain a low-sodium diet (less than 2 grams per day).
	Plan Orders	CMP to be performe counseling include(-Routine.
2.	Assessment	Mixed hyperlipiden
	Impression	check labs..
3.	Assessment	Anxiety disorder, u
	Impression	continue meds..
4.	Assessment	Insomnia, unspecifi
	Impression	stable on meds..
5.	Assessment	Hyperlipidemia LDL
	Impression	as abve..
6.	Assessment	Radicular pain in lef
	Plan Orders	Physical Therapy in ddd. .
7.	Assessment	Encounter for scree
8.	Assessment	Hyperglycemia (R73
	Plan Orders	HEMOGLOBIN A1C t
9.	Assessment	Body mass index (BM

Provider Plan Diagnosis code placed f

History of Present Illness

1. hypertension

It is currently stable. Risk factors includ high salt intake, inactive lifestyle, male pain, dyspnea and headache.

Chat with AIssistant

Hello, I am an Artificial Intelligence based assistant. How can I help you?

Could you please search for any Marfan syndrome Disorders?

Sure, I haven't been fine tuned to accurately find this. However, based on the reading of the document, I did find some Marfan syndrome information you might want to check in page 16,17 and 50.

Ask a question

Summary | Details

Search summary...

Gender/occupation/citizenship

Gender	Female
Occupation	Accountant
! Citizenship	Information not specified in provided documents
Travel	No foreign travel vaccination discussion noted

Vitals

Height	175 cm
Weight	93 kg
BMI	30.4

Blood pressure readings

Reading 1	145 / 90	06/01/2023

Tobacco use history/status

Tobacco use	Current smoker, 20 cigarettes per day

Personal medical history

Heart and blood pressure issues	Hypertensive disease	06/01/2020
Cancer	Family history of breast cancer in sister	12/01/2020
Respiratory disorders	Asthma	06/01/2020
Musculoskeletal Issues	ACL, discussed surgery but proceeded only with physio	23/02/2020
Surgery/Medical Procedures	ACL, discussed surgery but proceeded only with physio	06/01/2020
Recent prescribed Medication	Amlodipine 5mg Tab 1 tab per day, Micardis 80mg - 25mg 1 tab per day	12/01/2020

Application_Richie.PDF
Page 1 of 57

Application_Richie.P...

PATIENT:
DATE OF BIRTH: 11/14/1962
DATE: 08/18/2023
VISIT TYPE: Office Visit
PROVIDER:

This 60 year old female presents for hypertension, anxiety and insomnia. *Established patient*

Assessment/Plan

#	Detail Type	Description
1.	Assessment	Essential (primary) hypertension (I10).
	Impression	stable on meds.
	Patient Plan	Advised to maintain a low-fat, low-cholesterol diet. Counseled on reducing risk factors to reduce chance of heart attack/stroke. Reviewed lab results in detail. Counseled regarding importance of weight loss. Maintain a low-sodium diet (less than 2 grams per day).
	Plan Orders	CMP to be performed and Lipid Panel - LIPID to be performed. Today's instructions / counseling include(s) Follow a low sodium diet and Increase activity. follow-up visit -Routine.
2.	Assessment	Mixed hyperlipidemia (E78.2).
	Impression	check labs..
3.	Assessment	Anxiety disorder, unspecified (F41.9).
	Impression	continue meds..
4.	Assessment	Insomnia, unspecified type (G47.00).
	Impression	stable on meds..
5.	Assessment	Hyperlipidemia LDL goal <100 (E78.5).
	Impression	as abve..
6.	Assessment	Radicular pain in left arm (M79.2).
	Plan Orders	Physical Therapy in 4 Weeks. Clinical information/comments: Axis, neck pt cervciall ddd. .
7.	Assessment	Encounter for screening mammogram for malignant neoplasm of breast (Z12.31).
8.	Assessment	Hyperglycemia (R73.9).
	Plan Orders	HEMOGLOBIN A1C to be performed Today.
9.	Assessment	Body mass index (BMI) 30.0-30.9, adult (Z68.30).

Provider Plan Diagnosis code placed for administrative purposes.

History of Present Illness

1. hypertension

It is currently stable. Risk factors include African American race, age over age 60, depression, high salt intake, inactive lifestyle, male gender and obesity. Pertinent negatives include chest pain, dyspnea and headache.

Benefits

Used in underwriting, claims or as a post-issue tool

Reduces human error and improves consistency

Enables quicker manual underwriting or claims processing

Underwriters and claims assessors able to focus more on high-value tasks

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Benefits

The business case centres around the savings in operational costs without impacting the risk profile

Example (medium-sized insurer with high STP rate)	Without UW assistant tool	With UW assistant tool - Scenario 1	With UW assistant tool - Scenario 2
Applications with additional medical evidence (per year)	12,000		
Human underwriter – cost per hour	£50		
Human underwriter – time per case	1 hour	30 mins	10 mins
Total human underwriting cost (per year)	£600k	£300k	£100k
Potential annual savings		£300k	£500k

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What are the challenges in building a Gen AI tool for underwriting and claims?

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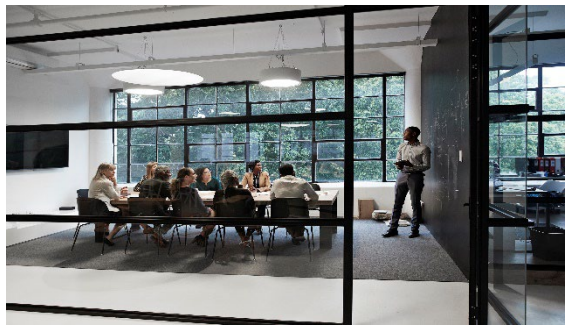
Challenges

The promise of Generative AI is high, but it is moving quickly and needs considered adoption into business processes

Fast-moving environment



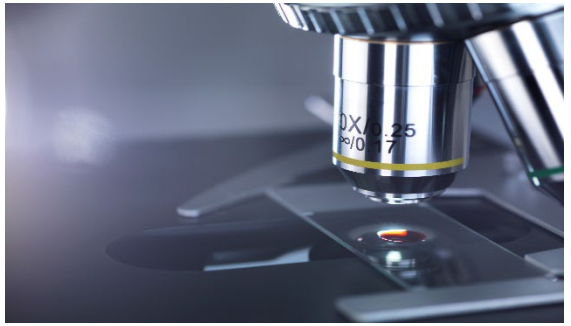
Management buy-in

Insurance specificities

Benefits > Costs?

Security

Guardrails



Testing

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Why do we need underwriting and claims expertise to help build a solution?

Expertise
Sponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
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A tool needs to be more than an LLM

Underwriting and claims expertise is important in prompt engineering and post-processing

Date	Height	Weight	BMI
1 Jan 2022	1.70 cm	90.2 kg	31.2
30 May 2022	1.69 cm	88.3 kg	30.9
18 Nov 2022	1.70 cm	86.2 kg	29.8
1 May 2023	1.69 cm	80.1 kg	28.0

What BMI will the underwriter want to see?

Date	Height	Weight	BMI
1 Jan 2022	1.70 cm	90.2 kg	31.2
30 May 2022	1.69 cm	58.3 kg	20.4
18 Nov 2022	1.70 cm	86.2 kg	29.8
1 May 2023	1.69 cm	80.1 kg	28.0

How will we spot data errors?

Electronic Health Record	
Date	BMI
1 Jan 2022	31.2

Blood Test Report	
Date	BMI
12 June 2022	33.0

Application Form	
Date	BMI
1 June 2022	30.9

Which data source do we trust when they tell us different things?

Impairment	UW Decision
'Mild' Asthma + no smoking	Standard rates
'Mild' Asthma + smoking	+50%
…	
'Severe' Asthma + no smoking	+250%

How do we ensure we extract sufficient and relevant information for each impairment?

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Summarisation is good but full integration is the gold standard

The real value comes when underwriting summaries can be structured to feed underwriting rules engines…but still with human review

Underwriting summary for human underwriters to review

+ Integration into underwriting workbenches and admin systems

+ Link to underwriting manual to return suggested underwriting decision

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When will it fully replace human underwriters?

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Never ?

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Risks and mitigations

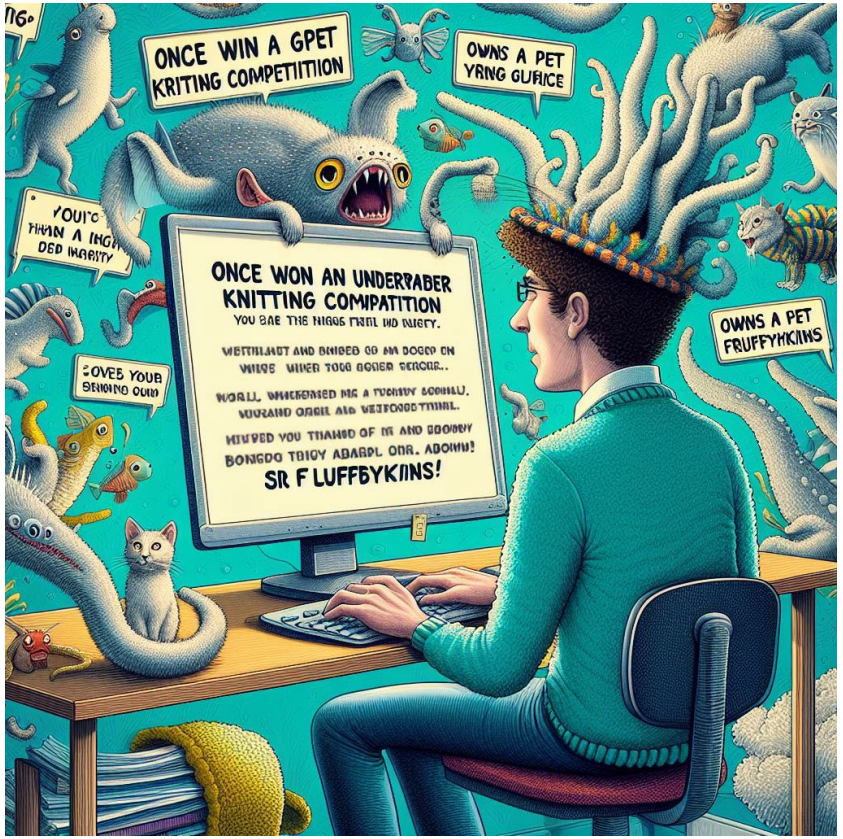
All AI carries risk, but generative AI has additional risk

Risks

- Hallucinations – incorrect conclusions
  - Decisions too harsh
  - Decisions too lenient
- Inability to act on misrepresentation at claim stage
- Legal – the right to request human decisions
- Legal – use of impermissible data
- Data/systems may evolve

Mitigations

- Human review of every case used in UW/claims
- Regular testing



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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

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