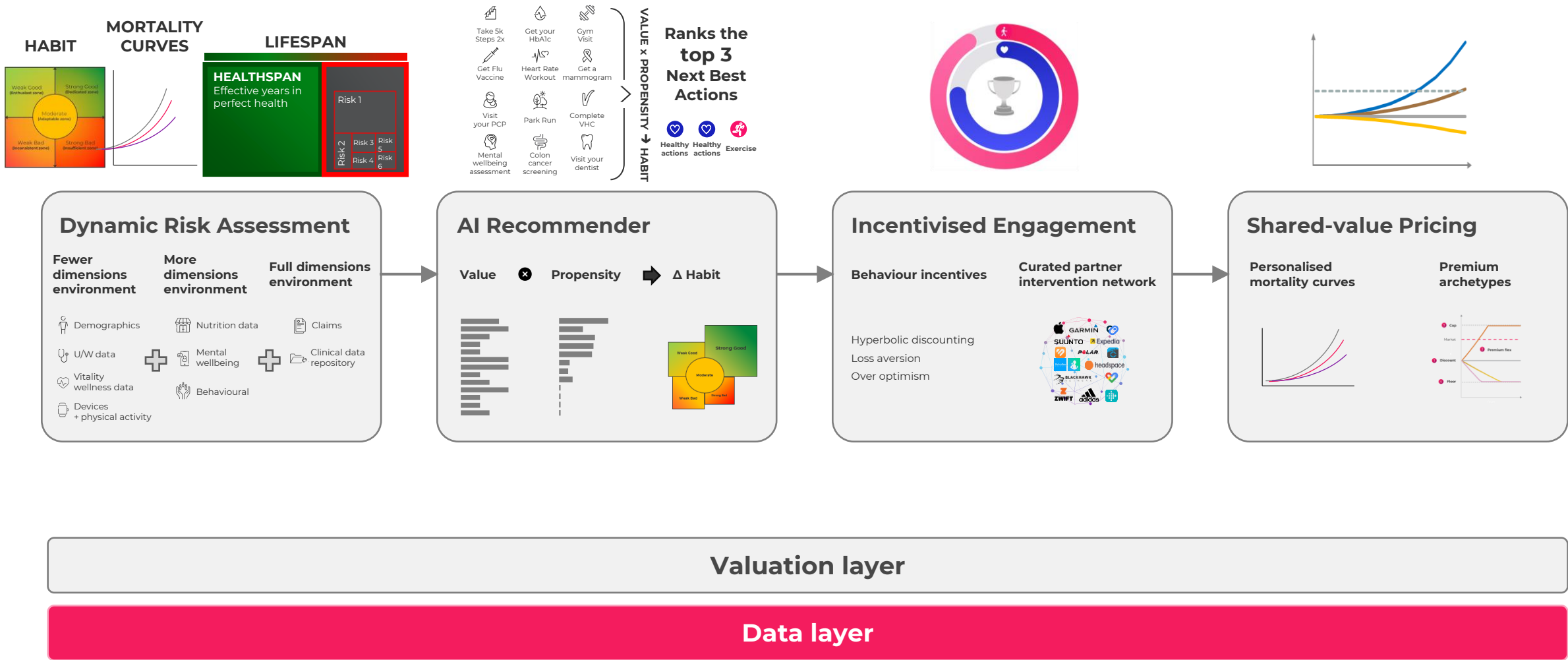# Setting our data up for the future

Jonathan Broomberg, CEO, Vitality Health International
Brian Hartzer, CEO, Quantium Health

Data and AI play a fundamental role in enabling hyper-personalisation

HABIT   **MORTALITY CURVES**   **LIFESPAN**

HEALTHSPAN
Effective years in perfect health

Risk 1
Risk 2 | Risk 3 | Risk 5
Risk 4 | Risk 6

Take 5k Steps 2x | Get your HbA1c | Gym Visit
Get Flu Vaccine | Heart Rate Workout | Get a mammogram
Visit your PCP | Park Run | Complete VHC
Mental wellbeing assessment | Colon cancer screening | Visit your dentist

VALUE × PROPENSITY → HABIT

Ranks the top 3 Next Best Actions

Healthy actions   Healthy actions   Exercise

Dynamic Risk Assessment

Fewer dimensions environment	More dimensions environment	Full dimensions environment
Demographics	Nutrition data	Claims
U/W data	Mental wellbeing	Clinical data repository
Vitality wellness data	Behavioural	
Devices + physical activity		

AI Recommender

Value ⊗ **Propensity** ➡ **Δ Habit**

Weak Good | Strong Good
Moderate
Weak Bad | Strong Bad

Incentivised Engagement

Behaviour incentives   **Curated partner intervention network**

Hyperbolic discounting
Loss aversion
Over optimism

GARMIN SUUNTO Expedia POLAR headspace BLACKHAWK ZWIFT adidas

Shared-value Pricing

Personalised mortality curves   **Premium archetypes**

Cap
Market
Premium flex
Discount
Floor

Valuation layer

Data layer

Our comprehensive dataset enables a multi-dimensional customer perspective which drives personalisation
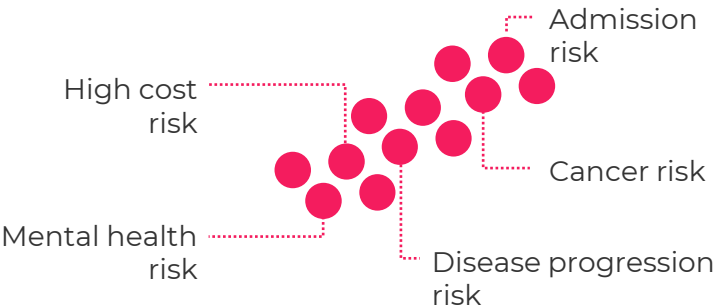
Member dimensions
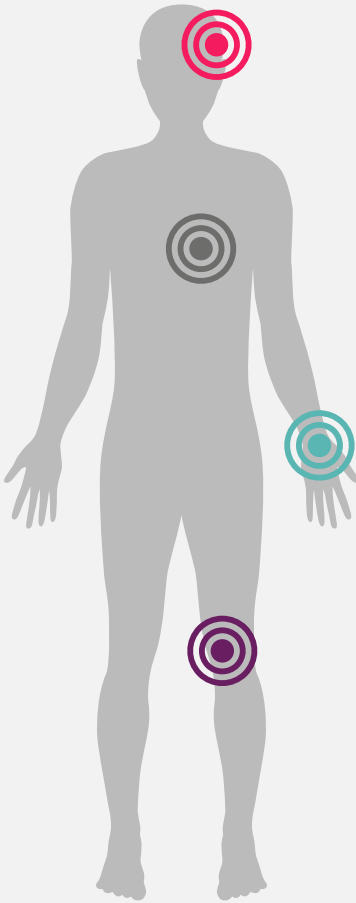
Clinical dimension
- Healthcare events
- Healthcare resource utilisation
- Pathology results
- Disease onset and progression

Wellness dimension
- Preventative care
- Nutrition
- Lifestyle

Operational dimension
- App, calls, email
- Inbound & outbound

Financial dimension
- Cost projections
- Premium projections
- Expense projections

Sales dimension
- New sales
- Cross-selling

Social dimension
- Communication channels
- Networks

Behavioural dimension
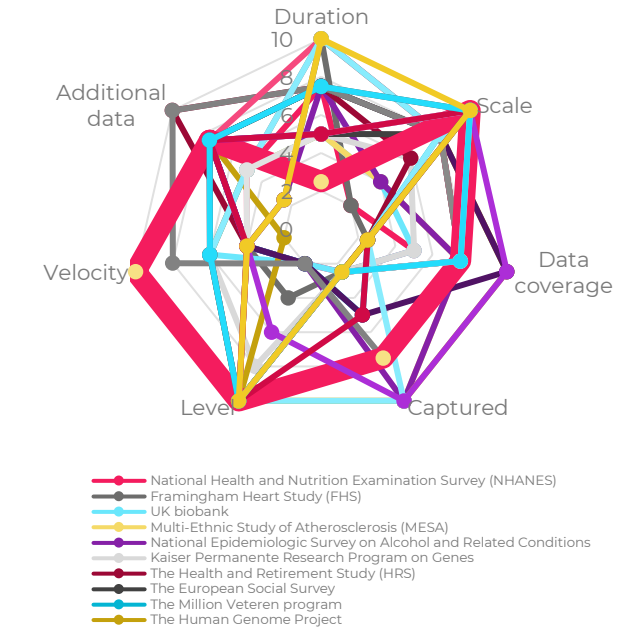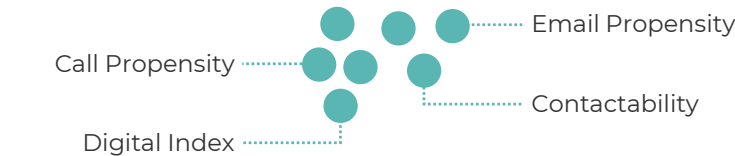- Habits, conscientiousness
- Motivations

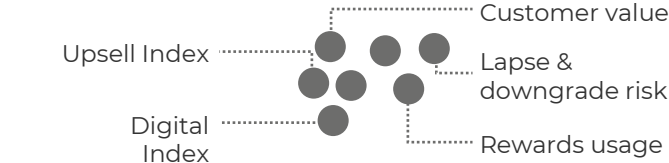## Multi-purpose Risk, Value and Propensity Universe

Individual scores

Clinical & wellness
- Admission risk
- High cost risk
- Cancer risk
- Mental health risk
- Disease progression risk

- National Health and Nutrition Examination Survey (NHANES)
- Framingham Heart Study (FHS)
- UK biobank
- Multi-Ethnic Study of Atherosclerosis (MESA)
- National Epidemiologic Survey on Alcohol and Related Conditions
- Kaiser Permanente Research Program on Genes
- The Health and Retirement Study (HRS)
- The European Social Survey
- The Million Veteren program
- The Human Genome Project

Radar axes: Duration, Scale, Data coverage, Captured, Level, Velocity, Additional data

Operational
- Email Propensity
- Call Propensity
- Contactability
- Digital Index

Sales, financial & behavioural
- Customer value
- Upsell Index
- Lapse & downgrade risk
- Digital Index
- Rewards usage

Hyper-personalised health and wellness actions are built and depend upon a strong foundation of data

Increasingly personalising the experience for our members

Evolving our core assets and technology

Hyper-personalised

AI DECISION AGENTS

LEARNING ALGORITHMS ← **Where we are today**

Personalisation

STATISTICAL MODELS

Evidence-based actions

CLINICAL EVIDENCE

Whole-of-health data across entire population

ENRICHED DATA
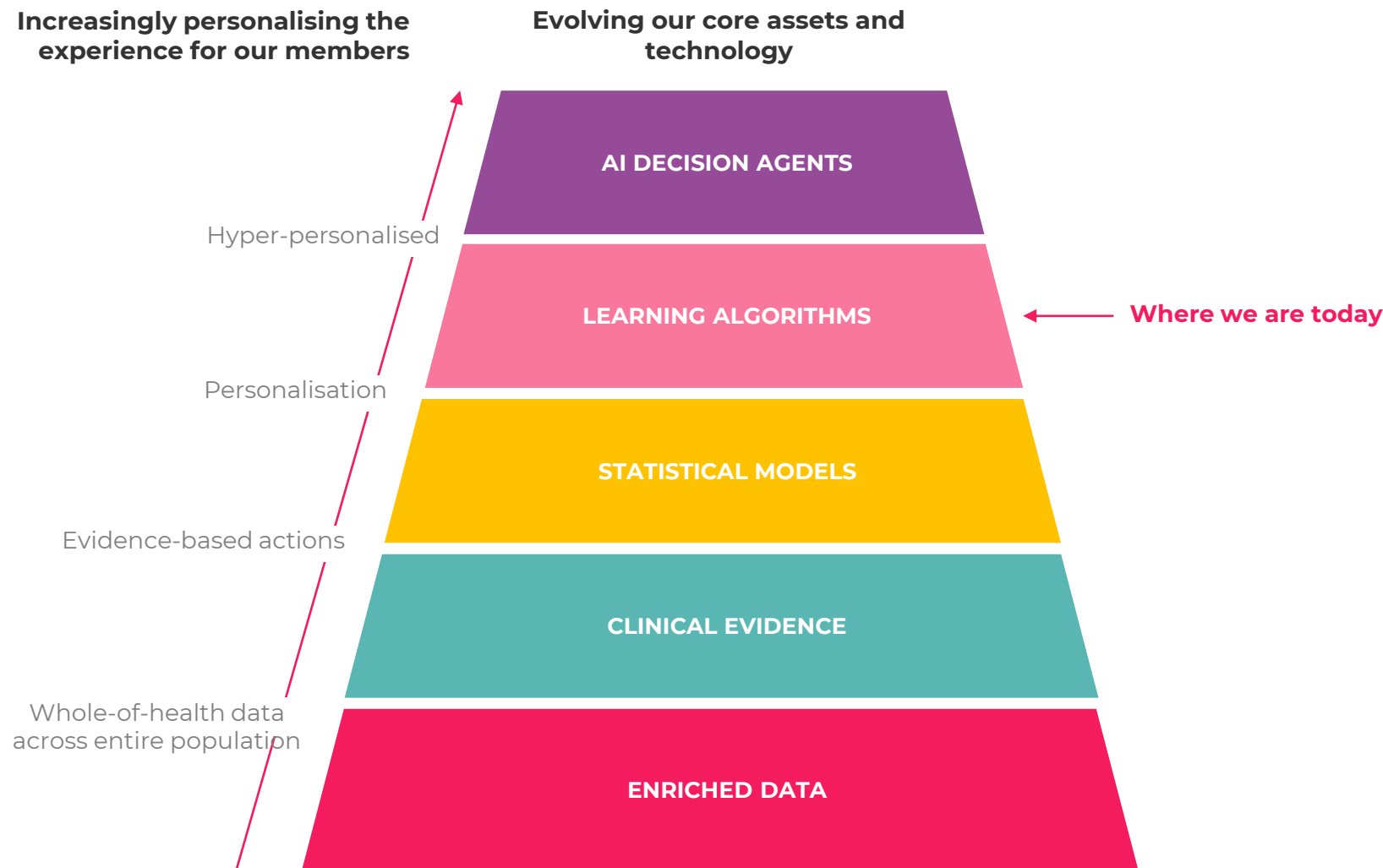
Vitality chose
to work with
Quantium
to accelerate our journey
towards
personalised, **predictive**
and
proactive engagement;
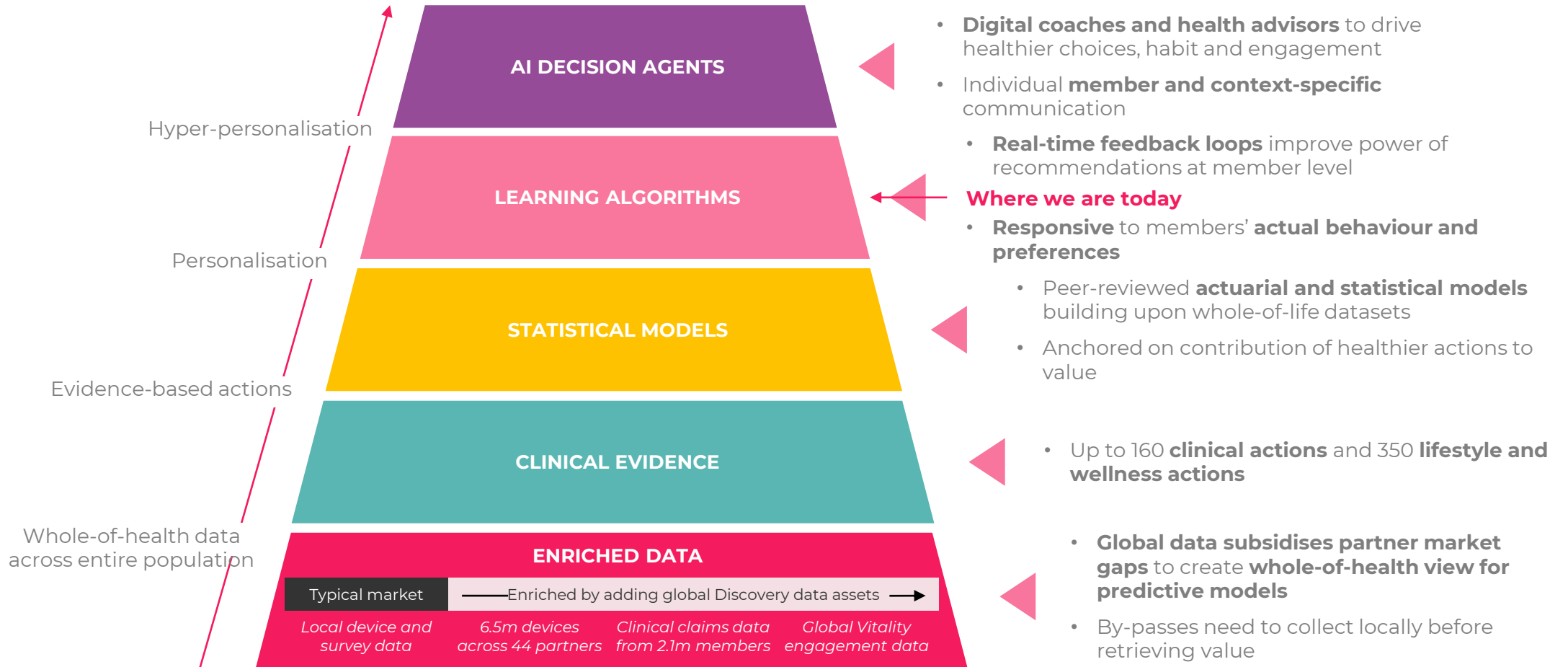and evolve our core assets
and technology

The partnership has facilitated the V.AI Platform - now housing an extensive range of Discovery Health and Vitality data and models

Increasingly personalising the experience for our members

Evolving our core assets and technology
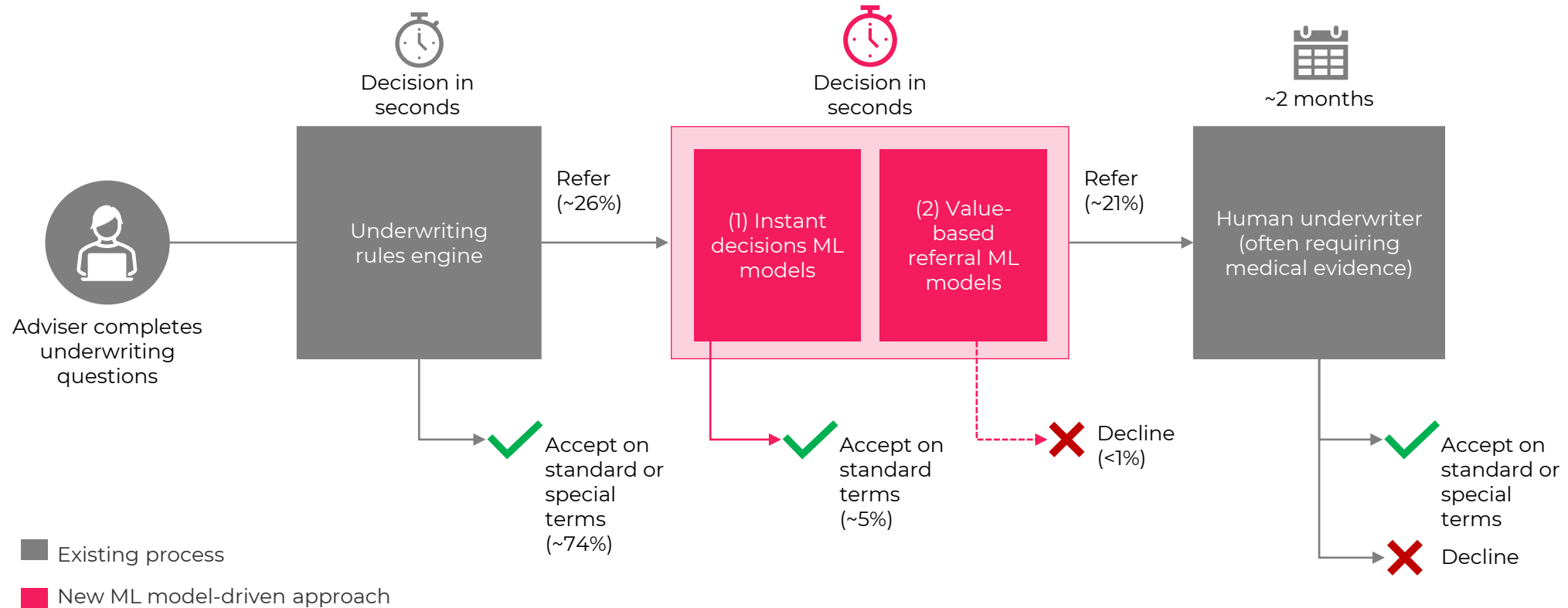
Bringing new capabilities to our partners

Hyper-personalisation

Personalisation

Evidence-based actions

Whole-of-health data across entire population

AI DECISION AGENTS

LEARNING ALGORITHMS

STATISTICAL MODELS

CLINICAL EVIDENCE

ENRICHED DATA

Typical market

Enriched by adding global Discovery data assets →

Local device and survey data

6.5m devices across 44 partners

Clinical claims data from 2.1m members

Global Vitality engagement data

- **Digital coaches and health advisors** to drive healthier choices, habit and engagement
- Individual **member and context-specific** communication
  - **Real-time feedback loops** improve power of recommendations at member level

Where we are today

- **Responsive** to members' **actual behaviour and preferences**
  - Peer-reviewed **actuarial and statistical models** building upon whole-of-life datasets
  - Anchored on contribution of healthier actions to value

- Up to 160 **clinical actions** and 350 **lifestyle and wellness actions**

- **Global data subsidises partner market gaps** to create **whole-of-health view for predictive models**
- By-passes need to collect locally before retrieving value

Our partnership with Quantium is proving to be fruitful, with exciting applications emerging across the value chain

Model driven Instant underwriting

Personalised Health pathways

Personalised Health pathways

Vitality UK: Model driven Instant underwriting

1 **Decision the lowest risk cases straight through**

2 **Facilitate sophisticated decisions on investment of underwriting resources**
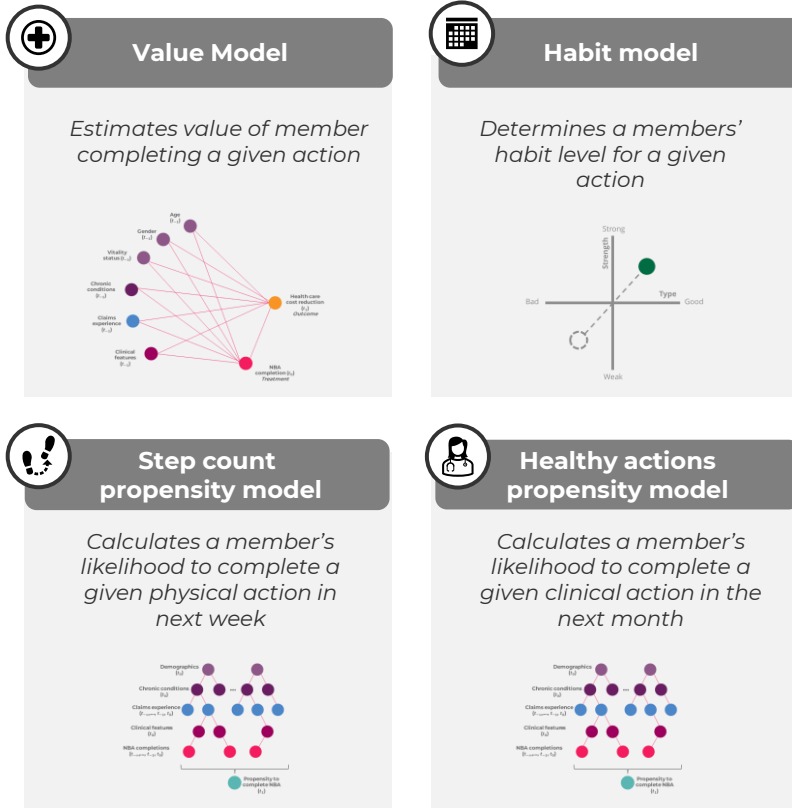

Decision in seconds

Decision in seconds

~2 months

Adviser completes underwriting questions

Underwriting rules engine

Refer (~26%)

(1) Instant decisions ML models

(2) Value-based referral ML models

Refer (~21%)

Human underwriter (often requiring medical evidence)

✓ Accept on standard or special terms (~74%)

✓ Accept on standard terms (~5%)

✗ Decline (<1%)

✓ Accept on standard or special terms

✗ Decline

Existing process

New ML model-driven approach

~5% increase in straight-through processing
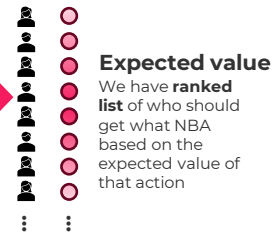**~20% reduction in referrals**

Discovery Health SA: recommending personalised healthy actions to members with chronic conditions
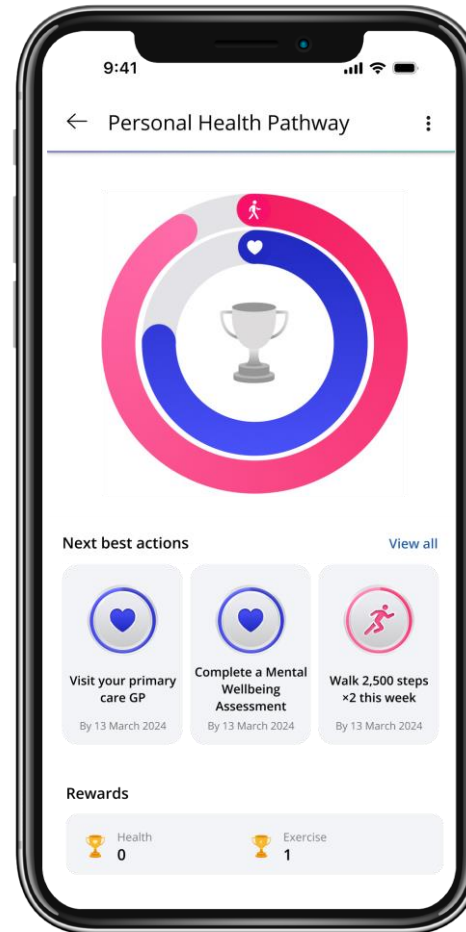
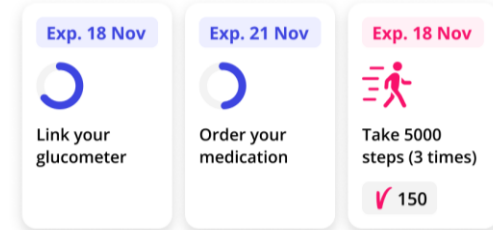## 4 models were built for the personalisation of recommendations on Q.AI

Value Model
Estimates value of member completing a given action

Habit model
Determines a members' habit level for a given action

Step count propensity model
Calculates a member's likelihood to complete a given physical action in next week

Healthy actions propensity model
Calculates a member's likelihood to complete a given clinical action in the next month

Creates ranked EV

Expected value
We have **ranked list** of who should get what NBA based on the expected value of that action

Next best action recommendations

9:41

← Personal Health Pathway ⋮

Next best actions — View all

Visit your primary care GP — By 13 March 2024

Complete a Mental Wellbeing Assessment — By 13 March 2024

Walk 2,500 steps ×2 this week — By 13 March 2024
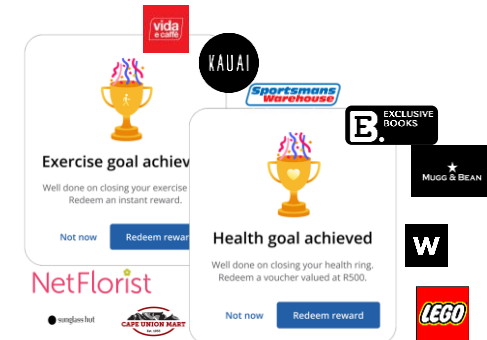
Rewards

Health 0
Exercise 1

Personalised **clinical and exercise** next best actions to improve health

Recommended
Next Best Action

Exp. 18 Nov — Link your glucometer

Exp. 21 Nov — Order your medication

Exp. 18 Nov — Take 5000 steps (3 times) ✓ 150

Personalised, Gamified rewards

Exercise goal achieved
Well done on closing your exercise Redeem an instant reward.
Not now | Redeem rewar

Health goal achieved
Well done on closing your health ring. Redeem a voucher valued at R500.
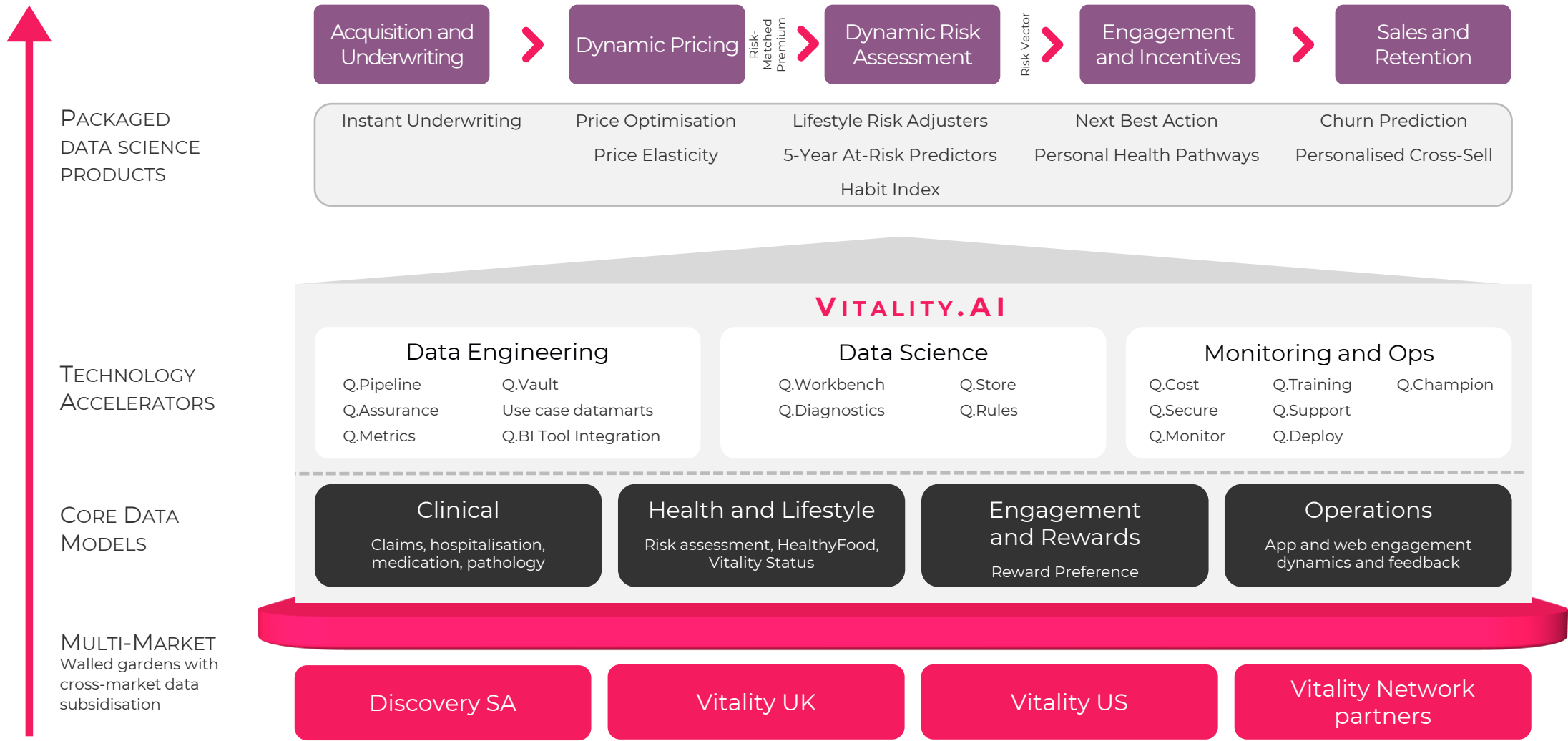Not now | Redeem reward

Vitality US: leveraging global models to deliver a more personalised health engagement platform with deeper disease management integration

Dynamic risk assessments

MARY

Age: 50
Columbus, Ohio

Diabetic

A1c > 8
BMI: 28

Doctor visits:
every 12-mo

GLP-1
prescription

Hospitalized
for
hypoglycemia

Exercises 1-2
times a week

Low stress

High propensity

Recommendation engine

Activity prioritisation

Points-earning activity
recommendations

Quarterly
HbA1c test

Annual
doctors
visit

Annual
flu shot

Diabetes
questionnaire

Activity value (size)

Higher — Lower

Barrier to engage (Color)

Higher — Lower

Simple member experience

Instant gratification

Gamification

Personalised care
activities

Hyper personalisation
and next-best actions

Dynamic
contributions

Care team
assigned
activities

Advanced risk
analysis &
classification

Our vision: create a global data science ecosystem, with transferable models and capabilities enabling hyper-personalisation at scale

VITALITY

| Acquisition and Underwriting | > | Dynamic Pricing | *Risk-Matched Premium* | Dynamic Risk Assessment | *Risk Vector* | Engagement and Incentives | > | Sales and Retention |

PACKAGED DATA SCIENCE PRODUCTS

Instant Underwriting	Price Optimisation	Lifestyle Risk Adjusters	Next Best Action	Churn Prediction
	Price Elasticity	5-Year At-Risk Predictors	Personal Health Pathways	Personalised Cross-Sell
		Habit Index		

VITALITY.AI

TECHNOLOGY ACCELERATORS

Data Engineering
- Q.Pipeline
- Q.Vault
- Q.Assurance
- Use case datamarts
- Q.Metrics
- Q.BI Tool Integration

Data Science
- Q.Workbench
- Q.Store
- Q.Diagnostics
- Q.Rules

Monitoring and Ops
- Q.Cost
- Q.Training
- Q.Champion
- Q.Secure
- Q.Support
- Q.Monitor
- Q.Deploy

CORE DATA MODELS

Clinical	Health and Lifestyle	Engagement and Rewards	Operations
Claims, hospitalisation, medication, pathology	Risk assessment, HealthyFood, Vitality Status	Reward Preference	App and web engagement dynamics and feedback

MULTI-MARKET
Walled gardens with cross-market data subsidisation

| Discovery SA | Vitality UK | Vitality US | Vitality Network partners |

Examples only – not exhaustive.

Quick Assist helps managers prioritise areas for improvement

Before
Quick assist

- **16,000+ hours** / week across 1,000 stores

- **600+ dashboards**

- **4,000+ process documents**

- **~5,000 Voice of Customer** comments per month

With
Quick assist (GenAI)

Key insights summarised in natural language

Action areas prioritised and highlighted

Required procedures to remedy identified

Customer issues extracted and summarised

"Everything needed to do my job is in **ONE** place"
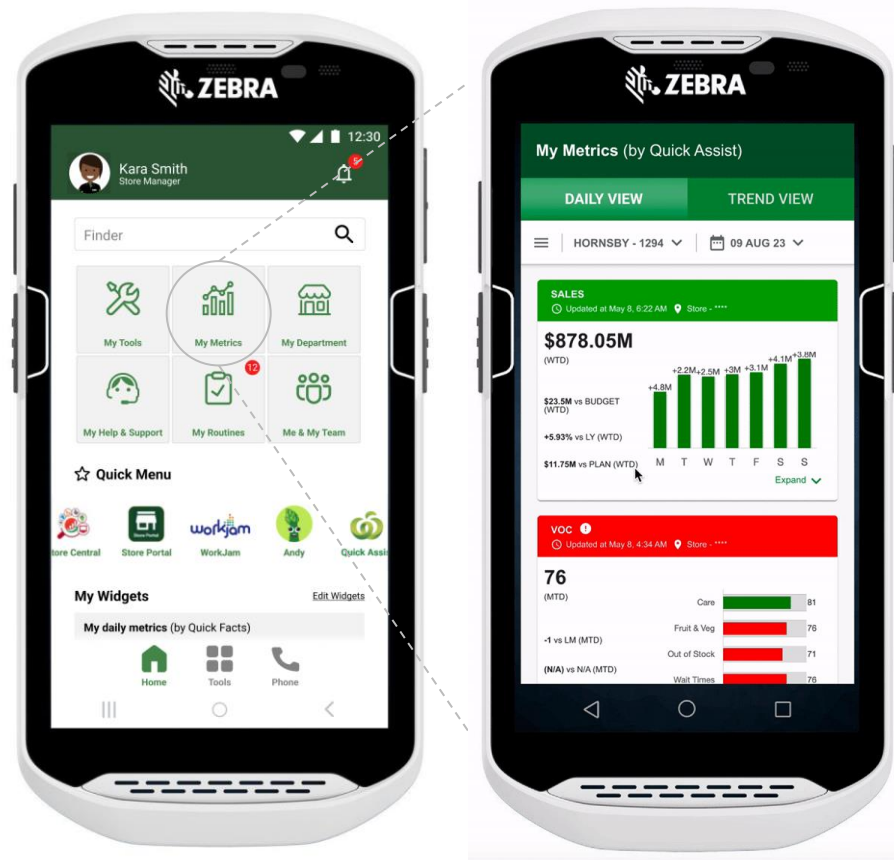
How GenAI can create value in insurance | examples

Decision-making support

- Automated underwriting
- Scenario analysis
- Financial performance analysis

Sales and retention

- Agent training
- Customised retention messaging
- Voice of Customer/Broker/Agent

Operational efficiency

- Servicing and Claims operations
- Claims validity and fraud detection
- Automation of customer-facing documents

Risk and compliance management

- Compliance breach identification
- Audit of vulnerabilities
- Automation of reporting to regulators, management

Product and service innovation

- Product selection support
- Digital assistants (knowledge management)
- New products and services (e.g., robo-advisory)

Human resource management

- Recruitment (e.g. analysing attributes of best agents)
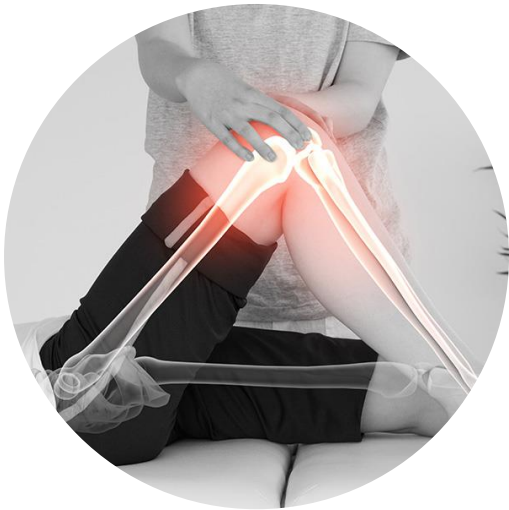- Onboarding for new agents
- Performance coaching

Not comprehensive

Challenges of GenAI in Enterprise

Regulation

Data privacy

Hallucination

Auditability and explainability

Ethics, bias and fairness

Cyber security risk
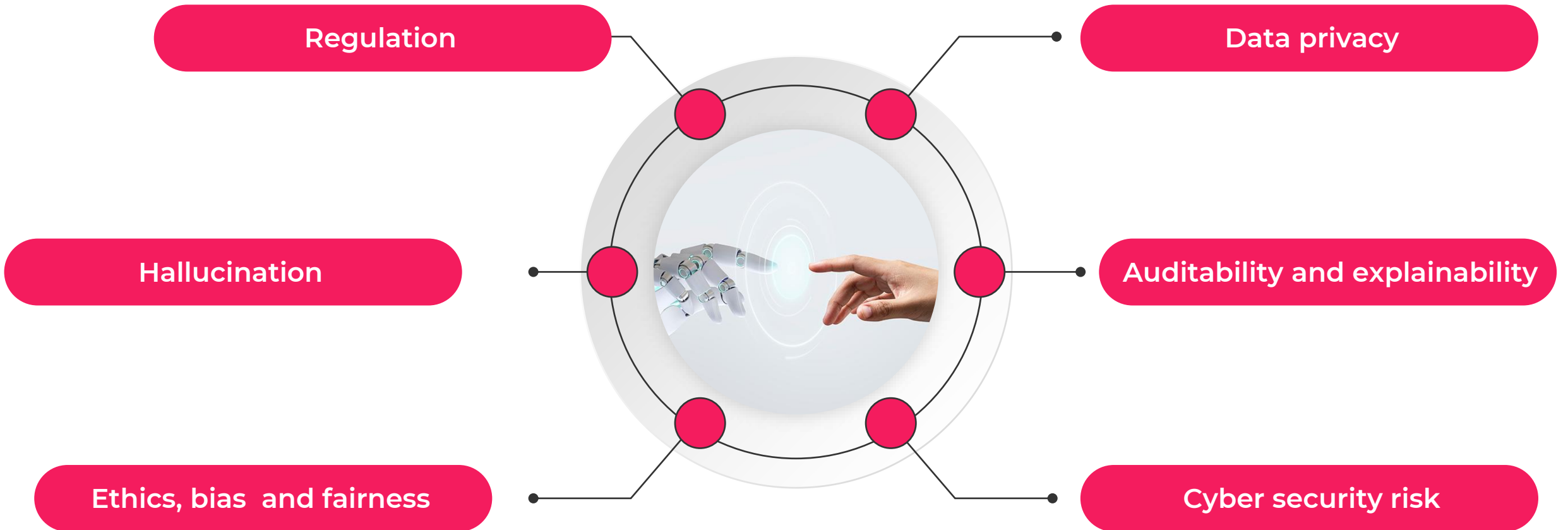
Example of GenAI in practice | Call centre support

How many more physio visits will you pay for?

Does your policy cover physio?

If so, how many claims payable in any year?

How many claims have you made this year?

What conditions must you satisfy first?
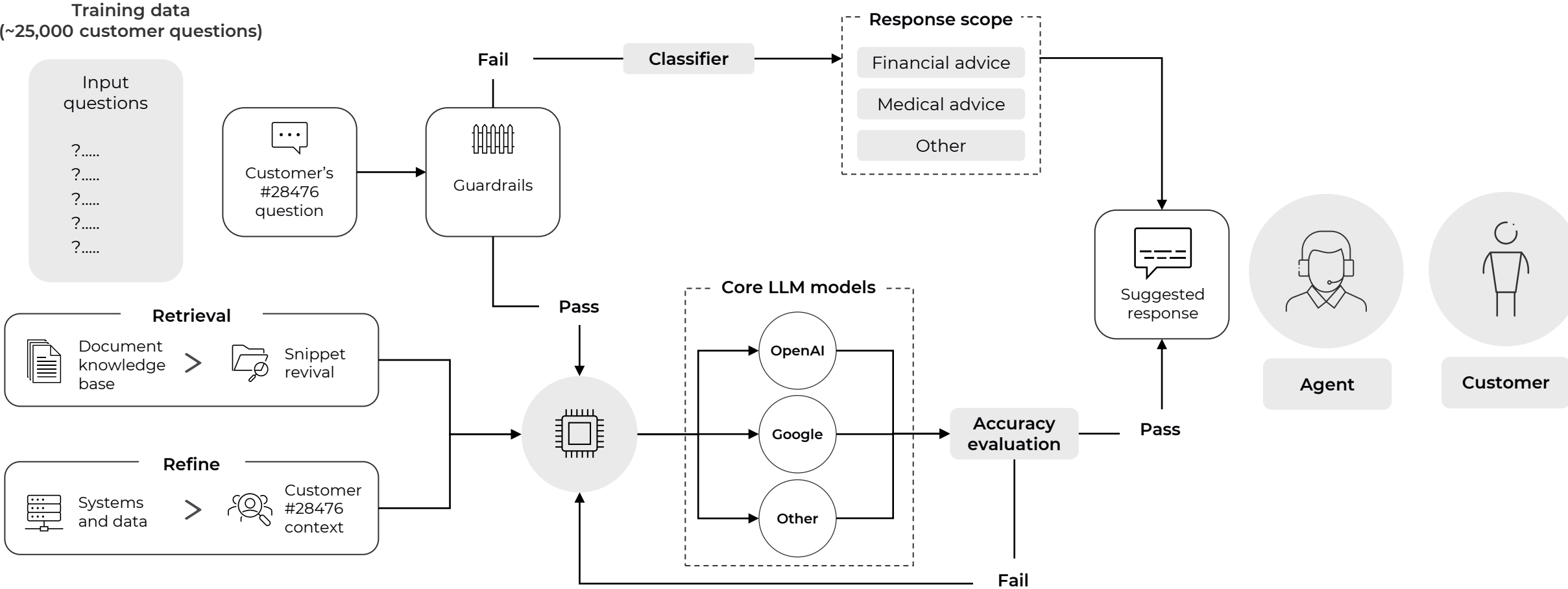
Challenges

Policy detail

Customer detail

Transactional history

Application of policy rules

Example architecture and control process

Training data
(~25,000 customer questions)

Response scope
- Financial advice
- Medical advice
- Other

Input questions

?.....
?.....
?.....
?.....
?.....

Customer's #28476 question

Guardrails

Fail

Classifier

Pass

Suggested response

Agent

Customer

Retrieval

Document knowledge base > Snippet revival

Refine

Systems and data > Customer #28476 context

Core LLM models
- OpenAI
- Google
- Other

Accuracy evaluation

Pass

Fail

Continuous improvement

01 Question density   **02** Guardrail   **03** Accuracy   **04** Cust/agent feedback   **05** Cost management

Key observations on GenAI implementation.... so far!

- Easy to get it working and equally easy to get it wrong

- Still a data science problem: all the same principles apply

- Quality is manageable, but only with appropriate controls

- Healthy tension between short-term impact and long-term architecture

- Costs can rise exponentially: careful solution architecture required

- Technology is developing rapidly: stay flexible

THANK YOU