FOCUS ON TECHNOLOGY:

TAPPING ARTIFICIAL INTELLIGENCE TO IMPROVE RETIREMENT OUTCOMES

HOW AI CAN TRANSFORM OUR INDUSTRY

WHAT IS ARTIFICIAL INTELLIGENCE?

- Neural Networks

NOBODY REALLY AGREES!

Scientific & Academic Definitions

- AGI

Commercial Definitions

- Machine Learning

- Deep Learning

Popular Culture Notions

- ASI

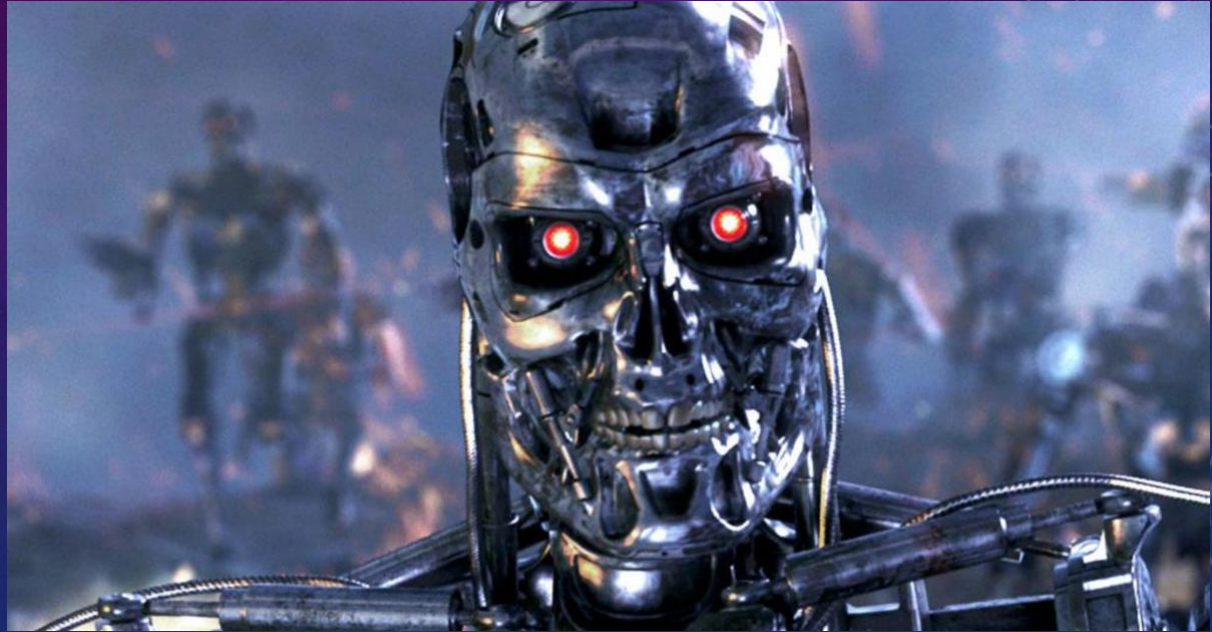- Anything that hasn't been done yet by computers!

AI AFTER GROWING UP

WHEN ARE THE ROBOTS GOING TO KILL US?

WHEN ARE THE ROBOTS GOING TO KILL US?

SOON!

AI, AGI, ASI

- AGI is sometimes referred to as "Full AI" since it refers to functions that span all human intellectual capabilities

- Artificial Superintelligence extends beyond human intellectual capabilities

- We may eventually build an AGI system that has the ability to make itself smarter

- At some point that AGI will be more intelligent than the collective intelligence of all humans

- "Self Aware" systems

YOU SAID "SOON." HOW SOON?

2013 Bostrom and Muller Survey

- Median optimistic year of AGI (10% likelihood): **2022**

- Median realistic year of AGI (50% likelihood): **2040**

- Median pessimistic year AGI (90% likelihood): **2075**

Barrat Survey (taken at AGI conference)

- By 2030: 42% of respondents predicted AGI
- By 2050: 25%
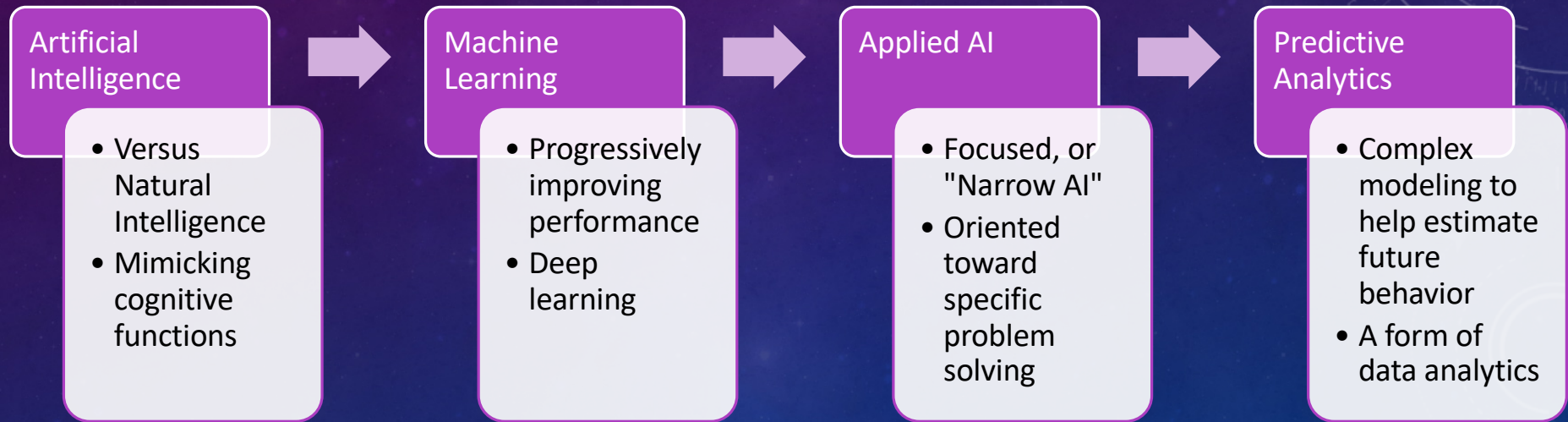- By 2100: 20%
- After 2100: 10%
- Never: 2%

APPLIED AI

- In commercial terms, this is the area that seems to be most relevant at the moment

- Sometimes this is referred to as "Narrow AI" as it is about software used to solve specific problems

- In the next decade this is what is going to be affecting us

- So even if we may not need to worry (yet) about AGI / ASI, we should be interested in how Applied AI affects us

AI AS IT MAY AFFECT US

Artificial Intelligence
- Versus Natural Intelligence
- Mimicking cognitive functions

→

Machine Learning
- Progressively improving performance
- Deep learning

→

Applied AI
- Focused, or "Narrow AI"
- Oriented toward specific problem solving

→

Predictive Analytics
- Complex modeling to help estimate future behavior
- A form of data analytics

WHY IS THIS A BIG DEAL RIGHT NOW?

CLOUD COMPUTING

CHEAP STORAGE

BIG DATA

ADVANCES IN GRAPHICS CARDS

INCREASED EXPECTATIONS

AI COMING TO AN INDUSTRY NEAR YOU

Wall Street
- Enron made an early attempt at bot trading
- Russian coders and AI experts are being bought up by hedge funds for 7, even 8 figures
- Estimate that computer-aided trading accounts for 70% of stock market trading volume
- Some have been at it for almost a decade

Courtrooms
- AI-Assisted sentencing, bail-setting
- Lawyer-bots auto-filing appeals based on likelihood of cases being overturned (traffic tickets, etc.)
- Clerk-bots performing discovery (reading case history) in a fraction of the time at a fraction of the cost

Hospitals
- Watson / China using AI to diagnose diseases.
- China's system already performing cancer diagnosis better than 70% of doctors (this is an old statistic)

Security
- The age of passwords is ending (aside from becoming unwieldy, and not safe anymore)
- Google, Apple building AI for identity confirmation
- VISA, eBay, PayPal using AI to eradicate false positivces

DO YOU SEE A PATTERN?

- Doctors, lawyers, bankers
- The robots aren't just taking over the factories and blue collar jobs
- AI is infiltrating industries that require high levels of *qualitative* decision making.
- Other areas:
  - Customer service: chat bots
  - Drivers: self-driving cars
  - Pickers / packers

HOW MANY YEARS BEFORE AI BEGINS TO BE ADAPTED FOR PENSION AND RETIREMENT ADMINISTRATION?

- 10 years?

- 5 years?

- 3 years?

- It's already here?

RETIREMENT ADMINISTRATION TRAJECTORIES

- Defined benefit plans are not getting simpler; they are still becoming more complex

- Members have built up higher expectations for customer/member service - both active and retired members

- Retired members would rather use simplified tools than go to a member portal

- Active members (for different reasons) would rather use something other than member portals

- Pension plans are starting to consider adding in financial planning to their services

RETIREMENT ADMINISTRATION & AI

- At least 4 leading companies within the retirement industry are already now actively pursuing AI

- Work is being done to improve the user experience

- Use of AI automates/augments manual back office processes for increasing scale and efficiency

- Use of natural language for interfacing

- Automated adjustments to IT infrastructure to manage workflow and processing increases or decreases

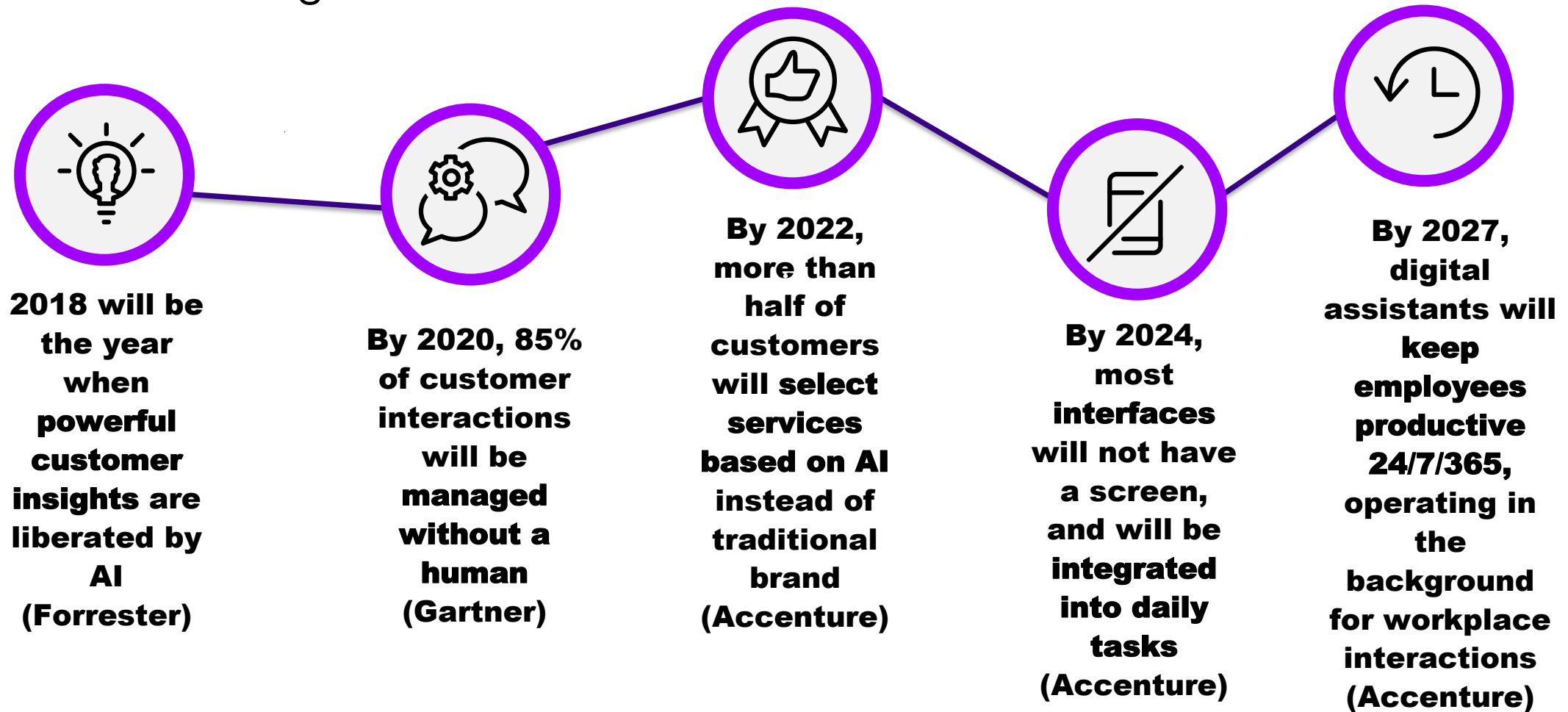- Questions still exist about whether staff would be replaced

WHAT WE SEE AS THE FUTURE OF THIS IN THE MARKET

ALEXA, RETIRE ME IN 2050

WHERE IS IT GOING

A 10-year view on the future of AI and how it could impact the consumer experience and organization of the future.

2018 will be the year when powerful customer insights are liberated by AI (Forrester)

By 2020, 85% of customer interactions will be managed without a human (Gartner)

By 2022, more than half of customers will select services based on AI instead of traditional brand (Accenture)

By 2024, most interfaces will not have a screen, and will be integrated into daily tasks (Accenture)

By 2027, digital assistants will keep employees productive 24/7/365, operating in the background for workplace interactions (Accenture)

FUTURE OUTLOOK

WHAT TO EXPECT IN THE NEXT 2-3 YEARS FOR VIRTUAL AGENT TECHNOLOGIES.

1 Exponential bot take up

Drastic boost in VA adoption across phone and IM: "Bots are the new Apps". Bots will quickly become a competitive necessity, and those slow off the mark, will lose out.

2 Improved NLP Accuracy

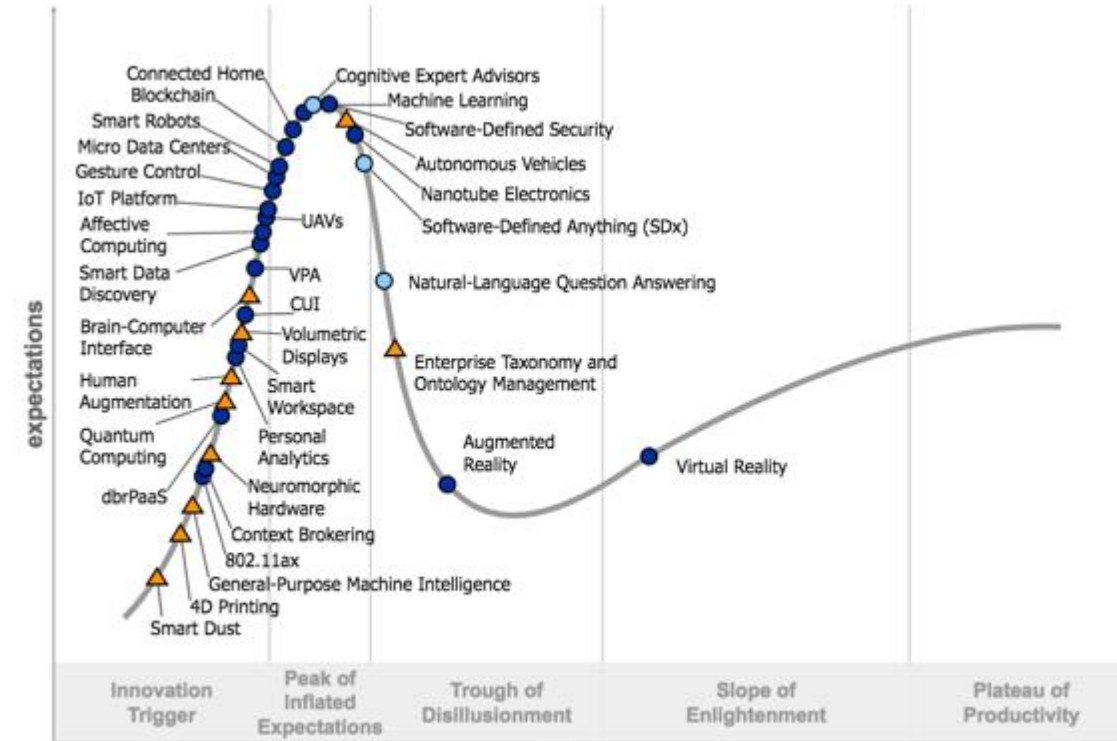Natural Language Processing Accuracy will shoot from 90-95% accuracy to 99%, dramatically improving customer experience.

3 Emergence of messaging

The emergence of asynchronous messaging for VA enables customers to progress from a one time conversation to conversations that can be stopped and picked-up again, at a time convenient to the consumer.

4 Voice & Emotion

Improvements in speech recognition and language translation will soon be coupled with emotion and sensitivity perception. Virtual agents will become increasingly responsive to human needs.

expectations

Connected Home
Blockchain
Cognitive Expert Advisors
Machine Learning
Smart Robots
Software-Defined Security
Micro Data Centers
Autonomous Vehicles
Gesture Control
Nanotube Electronics
IoT Platform
Software-Defined Anything (SDx)
Affective Computing
UAVs
Smart Data Discovery
VPA
Natural-Language Question Answering
CUI
Brain-Computer Interface
Volumetric Displays
Enterprise Taxonomy and Ontology Management
Human Augmentation
Smart Workspace
Quantum Computing
Personal Analytics
Augmented Reality
dbrPaaS
Neuromorphic Hardware
Virtual Reality
Context Brokering
802.11ax
General-Purpose Machine Intelligence
4D Printing
Smart Dust

Innovation Trigger | Peak of Inflated Expectations | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity

time

Plateau will be reached:

○ less than 2 years   ○ 2 to 5 years   ● 5 to 10 years   △ more than 10 years

⊗ obsolete before plateau

WE SEE FOUR BUSINESS SHIFTS DEFINING PENSIONS

VALUE	VOLUME	EXPECTATIONS	DELIVERY
Transaction Provider ····▶ Retirement Coach	In Person Service ····▶ Digital Self Service	System of Record ····▶ System of Interactions	On Premise ····▶ Cloud As A Service

AND FIVE TECHNOLOGY TRENDS AT WORK

Trend 1	Trend 2	Trend 3	Trend 4	Trend 5
CITIZEN AI	**EXTENDED REALITY**	**DATA VERACITY**	**FRICTIONLESS BUSINESS**	**INTERNET OF THINKING**
Raising AI to Benefit Business and Society	**The End of Distance**	**The Importance of Trust**	**Built to Partner at Scale**	**Creating Intelligent Distributed Systems**

WE SEE FOUR BUSINESS SHIFTS DEFINING PENSIONS

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Transaction Provider ⇢ Retirement Coach

VOLUME
In Person Service ⇢ Digital Self Service

EXPECTATIONS
System of Record ⇢ System of Interactions

DELIVERY
On Premise ⇢ Cloud As A Service

AND FIVE TECHNOLOGY TRENDS AT WORK

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Trend 4

FRICTIONLESS BUSINESS
Built to Partner at Scale

Trend 5
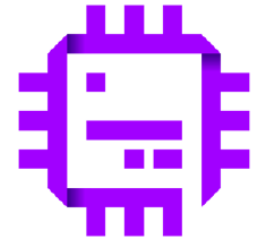
INTERNET OF THINKING
Creating Intelligent Distributed Systems

WHAT MEMBERS THINK OF THEIR PENSION PLANS AND RETIREMENT READINESS

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SERVING MEMBERS STARTS WITH UNDERSTANDING THEM

That's why we asked nearly 2,800 public and private employees with defined benefit, defined contribution and hybrid plans their views on top-of-mind pensions and retirement topics. Here's what we learned.

HOW DO MEMBERS EXPECT TO GET FROM TODAY TO TOMORROW?

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MOST MEMBERS THINK IT'S IMPORTANT TO START SAVING FOR RETIREMENT WHEN YOUNG

20 ——————— 30 ——————— 40
(AGE)

39%
started planning for retirement during their **20s**.

32%
think the best time to create a plan is between the ages of **31 and 40**.

41%
think the best time to create a plan is between the ages of **21 and 30**.
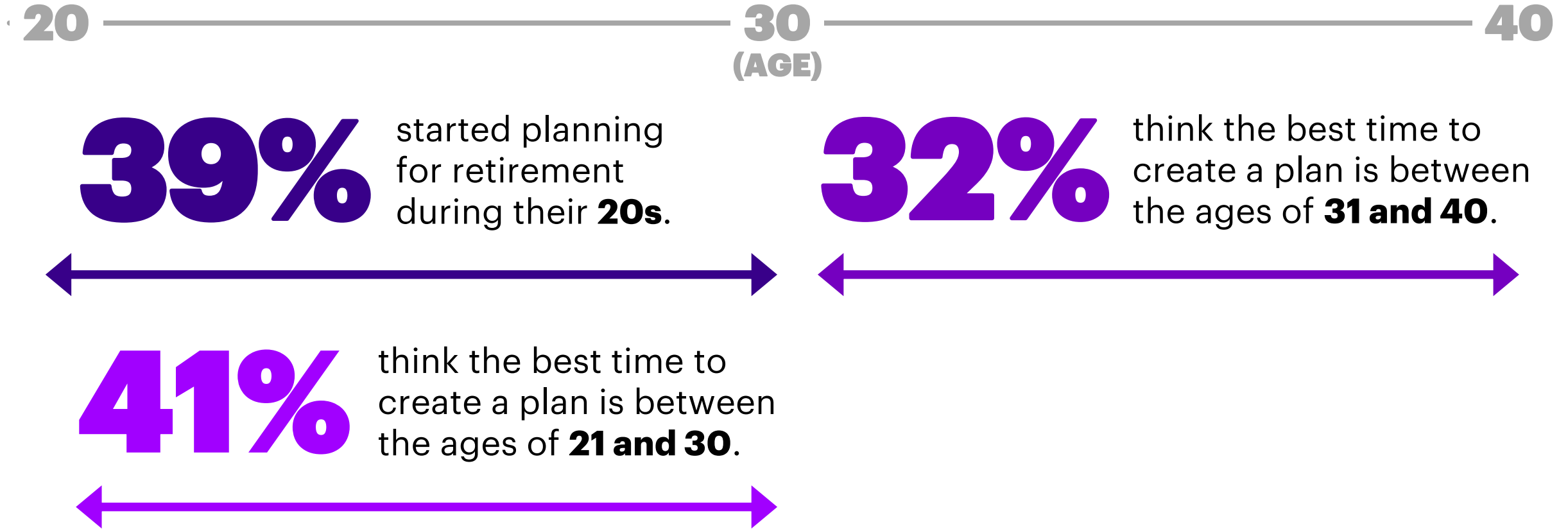
MEMBERS ARE HUNGRY FOR INFORMATION

77%
want more knowledge about retirement options.

1/3
think they have the right investments in their portfolio now.

82%
want more education on planning.

8

MEMBERS MOSTLY RELY ON THEMSELVES OR THEIR EMPLOYERS FOR INFORMATION

20%
rely on self research.

19%
rely on their employers.

12

MEMBERS SEE THE VALUE OF COACHING

84% would like to be coached during their entire working life to prepare for retirement.

69% would be less concerned about retirement if they had a coach.

BUT...

40% have not sought help to date.

1/2 say their employer doesn't provide coaching.

MEMBERS ARE OPEN TO DIGITAL RETIREMENT COACHING

While current usage is low—for now—members show a high interest in using digital channels to receive retirement coaching.

WHAT AI CAN DO FOR YOU NOW

BENEFITS AND OPPORTUNITIES

Well-Implemented Virtual Agents can have numerous and far reaching benefits.

The reduction of contact center traffic
A European governmental financial institution now handles 40% of its customer interactions without human intervention resulting in a 30% improvement in the speed of service

The fulfilment of new requests at reduced cost
On average, call computerization solutions deliver 60-80% cost saving compared to human powered call centers.

Ability to meet seasonal surges in demand
A VA implemented in a European governmental department saw a reduction in demand of 55% for operator tasks.

Increased service hours and languages
In Oregon, we are building an English and Spanish Chatbot that will provide Q&A support for a new retirement system through Facebook Messenger

Improved customer experience and engagement
A government department in southern Europe now has 75% of its raised tickets resolved by virtual agent, increasing user satisfaction by 20 points.

Improved flexibility/ time to market
The VA can be changed out in an instant for an updated version, and can proactively obtain survey information

Improved Compliance and auditability
A major UK Bank is considering implementing a VA after assessing Collette, a fully MCOB-compliant virtual mortgage adviser chatbot, increasing visibility and the capture of information.

Increased quality
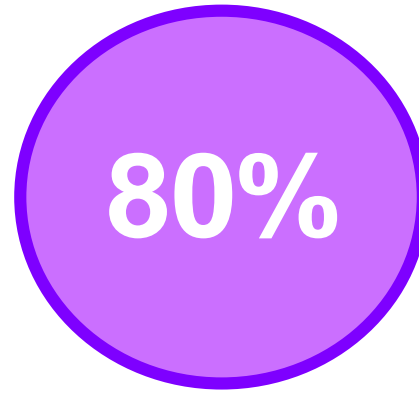The implementation of a VA for a Retail client increased click-through by 60% based on product recommendations.

VIRTUAL ASSISTANTS BENEFITS OUR EXPERIENCE

VAs have brought significant benefits as follows:

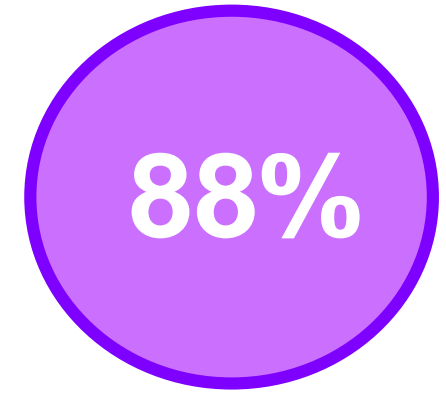**60%**

Handling Time optimization

The average handling time reduction delivered by VA solutions

80%

User Satisfaction

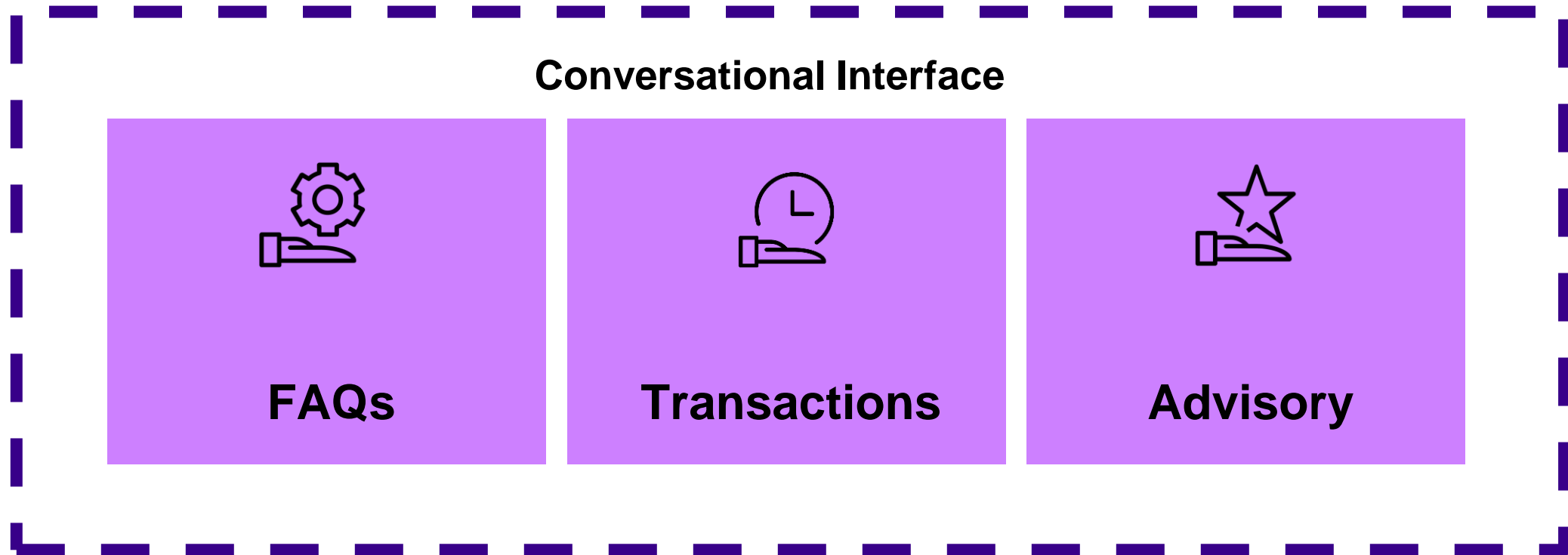Increase in positive user experience and user satisfaction using VA solutions

88%

Staffing Optimization

The average FTE reduction delivered via VA implementation

POSSIBLE USE CASES

Virtual agents are not just a new customer channel or user tool; they will power the next generation of digital experiences. We typically see three high-level use cases.

Conversational Interface

FAQs	Transactions	Advisory

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