Artificial Intelligence: Understanding the Issues

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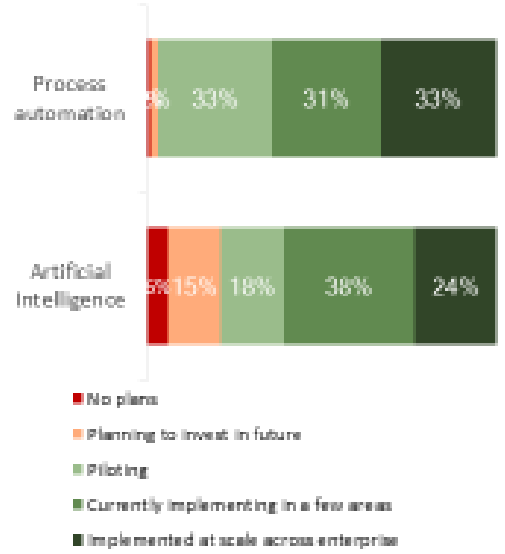
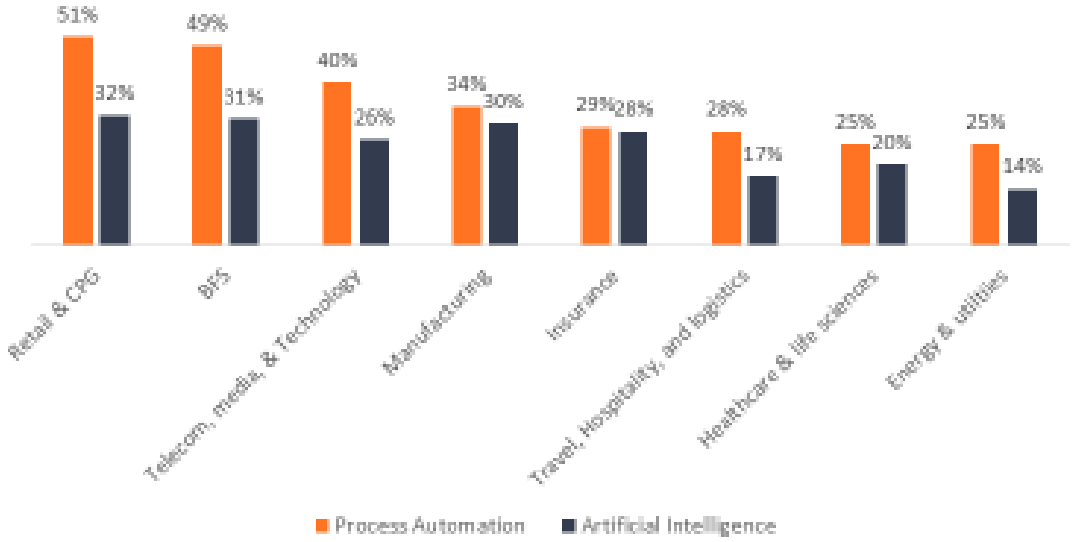
AI – Where are we?

Process automation and AI adoption by industry

At what stage of adoption is your company as it relates to the following technologies?
% respondents



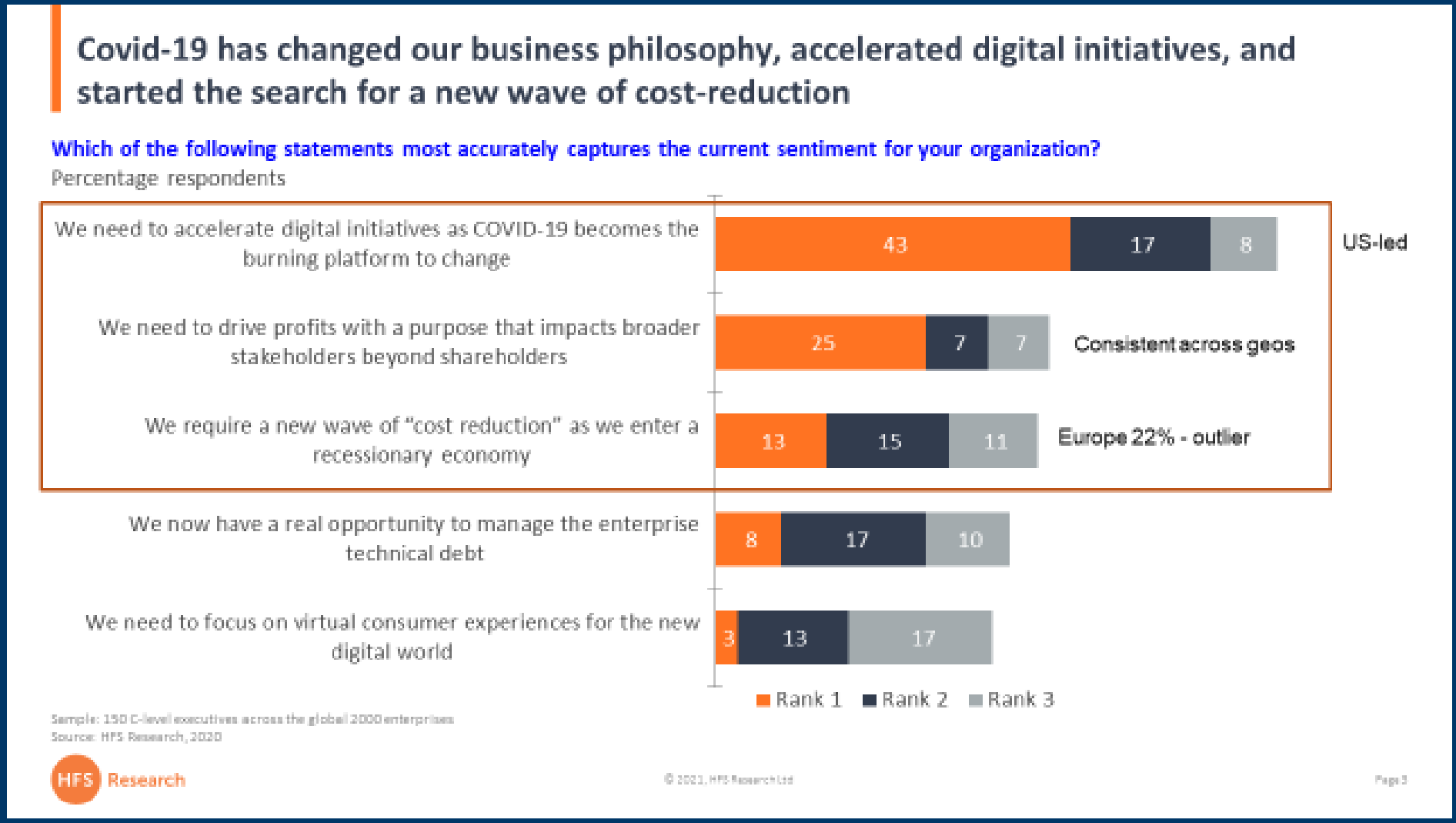
Relative adoption of automation and AI by industry
% respondents who have implemented AI/automation at scale across the enterprise



Notes: AI technologies include machine learning, deep learning, computer vision, digital assistants, NLP/NLG, and digital twins
Process automation technologies include BPMS, RPA, LCNC, and process mining
Sample: 600 executives across Global 200 enterprises
Source: HFS Research, 2020

HFS Research

Where are we headed?



COVID-19 Accelerates Adoption of Emerging Technologies

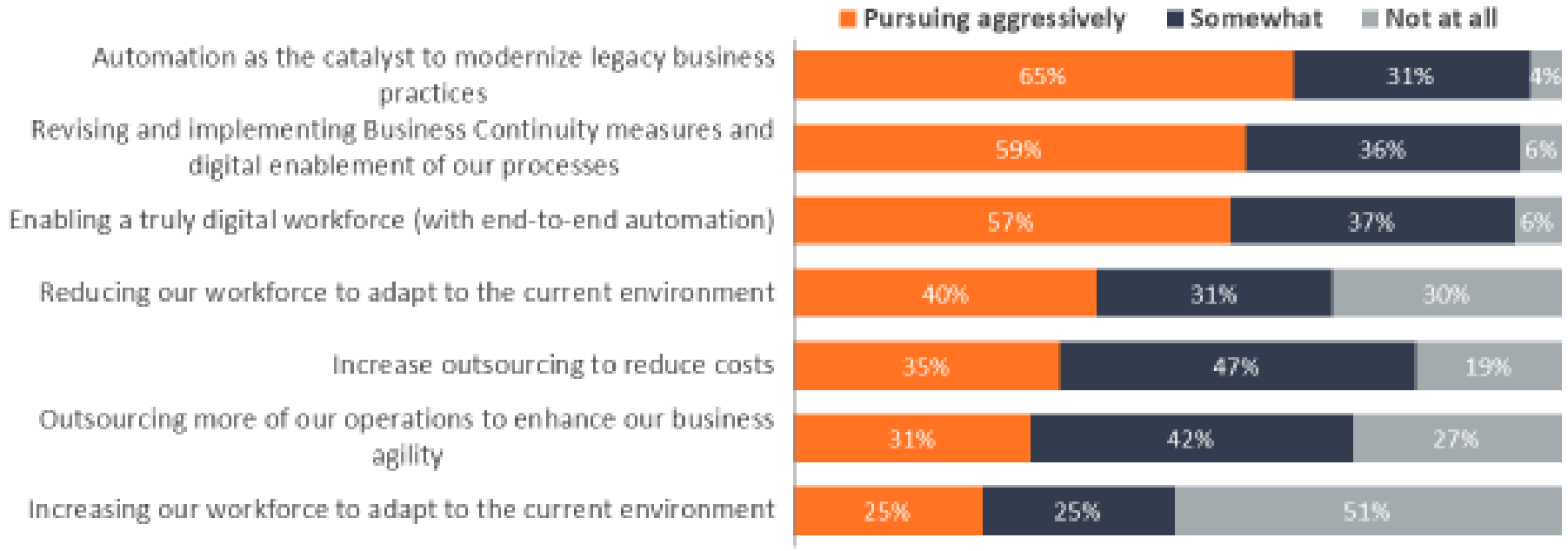
The top-ranked objective of investments in emerging technologies

Emerging technology	Pre-COVID-19 (March-April 2020)	Post-COVID-19 (May-June 2020)
Process automation	Cost-reduction (10%), improve brand value (10%), top-line growth (10%)	Essential for future survival (31%)
Artificial intelligence	Cost-reduction (12%)	Essential for future survival (22%)
Smart analytics	Improve decision making (12%)	Essential for future survival (21%)
Hybrid or multi-cloud	Cost-reduction (12%)	Essential for future survival (20%)
Blockchain	Foundation for infrastructure modernization (10%), improve decision making (10%), cost-reduction (10%)	Improve competitive positioning (23%)
Edge computing	Improve brand value (12%)	Improve competitive positioning (20%)
5G	Essential for future survival (10%), improve decision making (10%)	Essential for future survival (22%)

Sample: 300 executives (May-June 2020, Phase II sample) and 600 executives (March-April 2020, Phase I sample) across Global 2000 enterprises
Source: HFS Research in conjunction with KPMG

Pandemic Operational Strategies: Automate, Outsource without adding physical workers

Q. To what extent is your leadership pursuing the following operational strategies in this environment?



Sample: 400 executives across global 2000 enterprises
Source: HFS Research, 2020

HFS Research

AI in Action

Esquire

The Air Force's AI Brain Just Flew for the First Time

The Machine
Making sense of AI

Yelp built an AI system to identify spam and inappropriate photos

Kyle Wiggers @Kyle_L_Wiggers May 12, 2021 9:00 AM

Forbes

May 14, 2021, 12:20am EDT | 357 views

How Artificial Intelligence (AI) Is Helping Musicians Unlock Their Creativity

CIO UNITED STATES DIGITAL MAGAZINE

OPINION

AI at the Edge Keeps Trains on Track

Duos Technologies uses artificial intelligence, computer vision and edge computing to capture remote safety inspections without halting trains.

AI Is a Key Public Health Tool During COVID-19 Pandemic

Medical Xpress

MAY 12, 2021

Artificial intelligence tool uses chest X-ray to differentiate worst cases of COVID-19

by David March, NYU Langone Health

HEALTH IT ANALYTICS

xtelligent HEALTHCARE MEDIA

Artificial Intelligence Powers Rapid COVID-19 Antibody Test

SciTechDaily

Artificial Intelligence Model Predicts Which Immune System Key Opens the Locks of Coronavirus

MIT News

ON CAMPUS AND AROUND THE WORLD

Artificial intelligence model detects asymptomatic Covid-19 infections through cellphone-recorded coughs

Results might provide a convenient screening tool for people who may not suspect they are infected.

How India Fights COVID With Artificial Intelligence

12/05/2021

Technology Explained: Artificial Intelligence

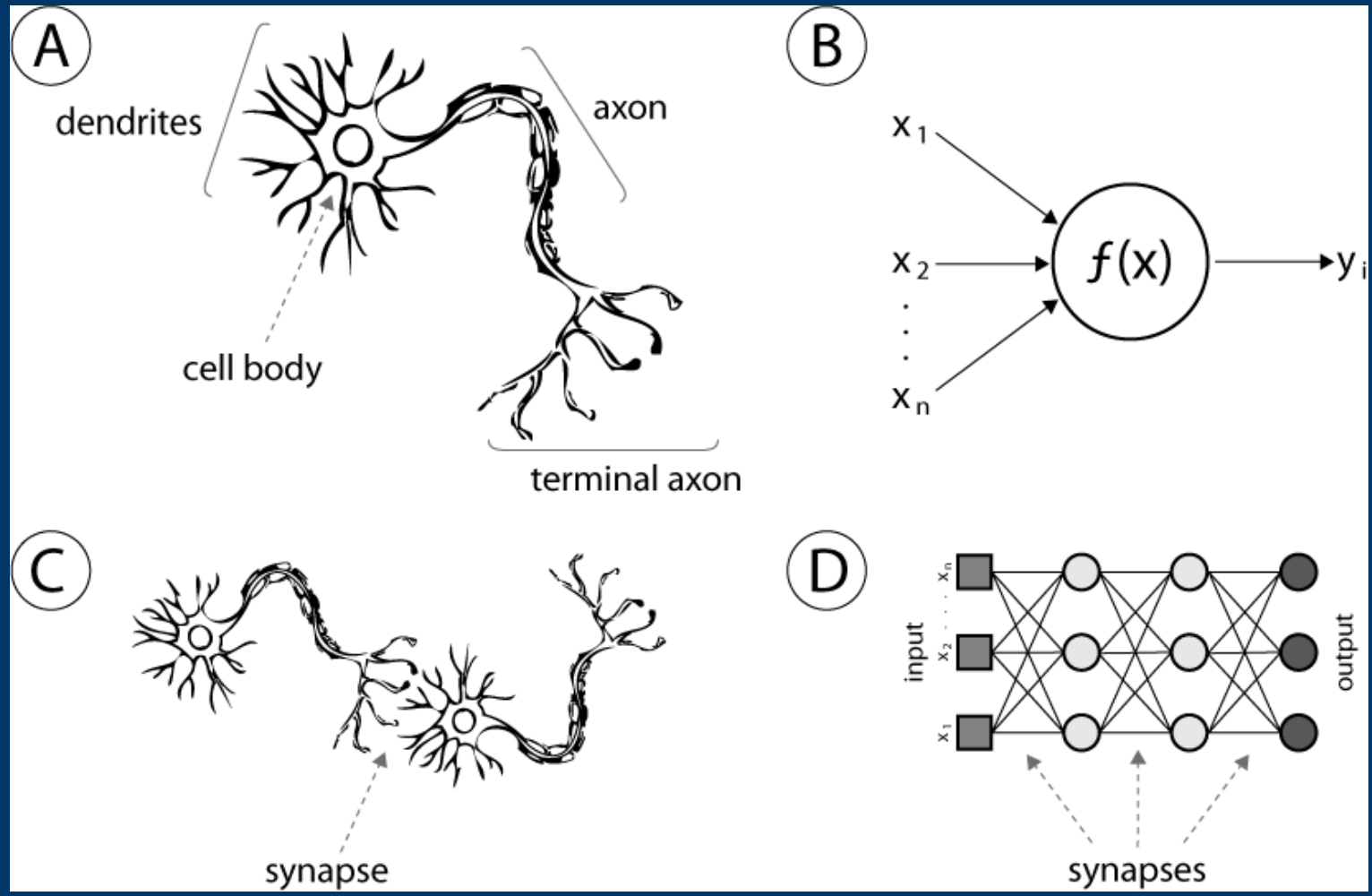
- **Artificial Intelligence (AI):** Actions performed by computer systems that we normally associate with human intelligence.
  - Data-driven “smart” software that can process unstructured data and automate subjective tasks through patterns.
  - Generally, cognitive AI mimics “human thinking.”
- **Machine Learning:** Building algorithms for a computer to perform a particular task through analysis, understanding and identification of patterns in data.
- **Deep Learning:** Structures algorithms in layers to create an “artificial neural network” that can learn and make intelligent decisions on its own.
- **Robotic Process Automation (RPA):** Software that can be easily programmed (creating “bots”) to do basic, repetitive tasks across applications.

Technology Explained: Artificial Neural Networks

Artificial Neural Networks

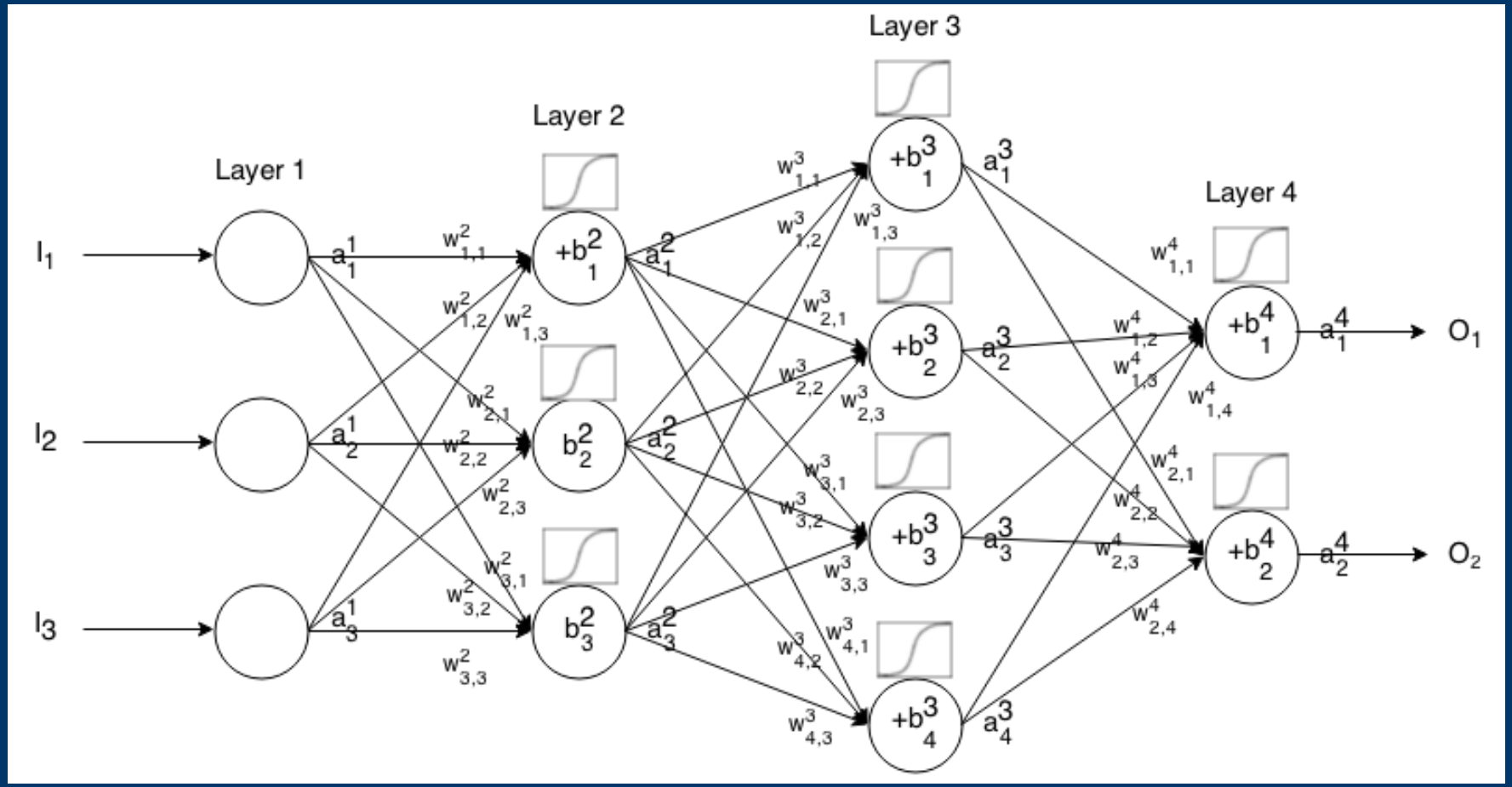
- Processing systems loosely modeled after the structure of neurons in the human brain
- Formed by layered series of nodes that activate one another through “weighted” connections
  - System uses statistical techniques to alter the “weights” that relate one node to another
  - After sufficient “training,” the system reaches a steady state
  - Thereafter, new input data is acted upon by the system, and the output depends on the “patterns” embodied in the relationships between the nodes

Technology Explained: Artificial Neural Networks



Source: Ivan Liljeqvist, Medium.com

Technology Explained: Artificial Neural Networks



Source: stats.stackexchange.com

Examples of AI Uses

- Autonomous vehicles
- Facial and speech recognition
- Financial planning
- Customer support
- Voice activated assistant (e.g., Siri)
- Personalized ads
- Navigation
- Smart home devices
- Price optimization
- Level 1 tech support
- Automated testing
- Payroll automation
- Loan processing
- Trade execution
- Invoice creation/ delivery
- Claims processing
- Forms processing
- Web scraping
- Account reconciliation

Examples of AI Across Industries

Automotive:

- Supply chain: predicting and adjusting production to respond to changes in supply and demand for autos; increased efficiencies in procurement
- Production: increases efficiency and reduction in risk of error; reduces the need for manual labor – and potential injury to workers; improves defect discovery.

Insurance:

- Reduce the need for manual rate calculations; simplify payment processes and paperwork processing for claims and appraisals; ensure compliance across jurisdictions

Examples of AI Across Industries

Health Care:

- Administration and Back Office: Reduce time spent on administrative and operational tasks including patient admission, discharge and transfer, billing and claims
- Patient care and diagnosis: Expand affordable care to underserved areas through telehealth, AI-triage consultations and medications; protect health care workers with contactless monitoring of vital signs and with thermal, sound and gesture sensors to detect sick individuals; improve diagnostics for medical imaging such as CT scans and X-rays; improve efficiency of laboratory tests
- Research: Analyze and identify patterns in complex datasets faster and more precisely; search scientific literature for relevant studies more efficiently; combine clinical and research data to match suitable patients with clinical trials more easily

AI Is the Future of Advertising

ENHANCED CONTEXTUAL TARGETING

COHORT-BASED TARGETING

ADVANCED ANALYTICS

PERFORMANCE OPTIMIZATION

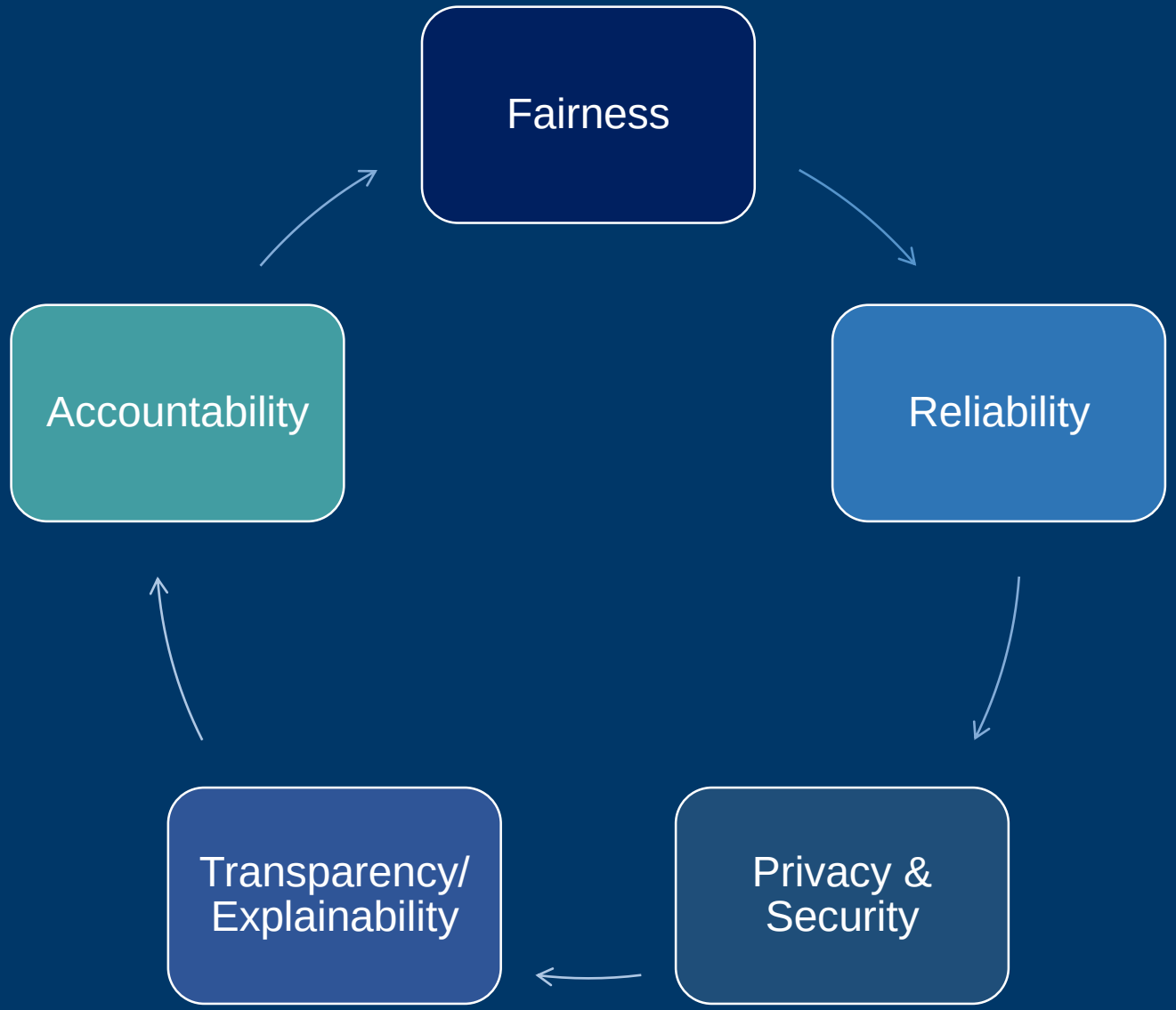
AUTOMATED CREATIVE

Data Ownership and Use

- Data fuels AI – but who owns the data?

- Differing types of data
  - Input data
  - Device data
  - Market data
  - Social media
  - Observed data
  - Derived data

KEY PRINCIPLES OF AI GOVERNANCE



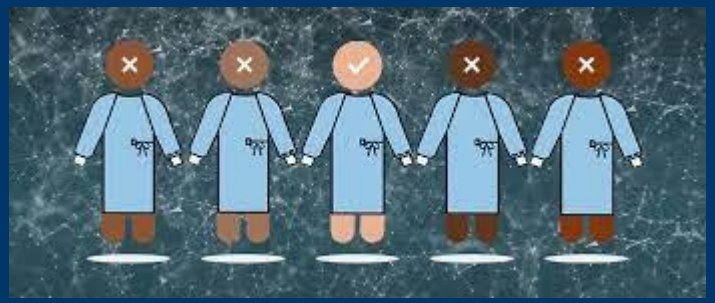
FAIRNESS: IDENTIFYING THE SOURCES OF ALGORITHMIC BIAS

Historical Bias

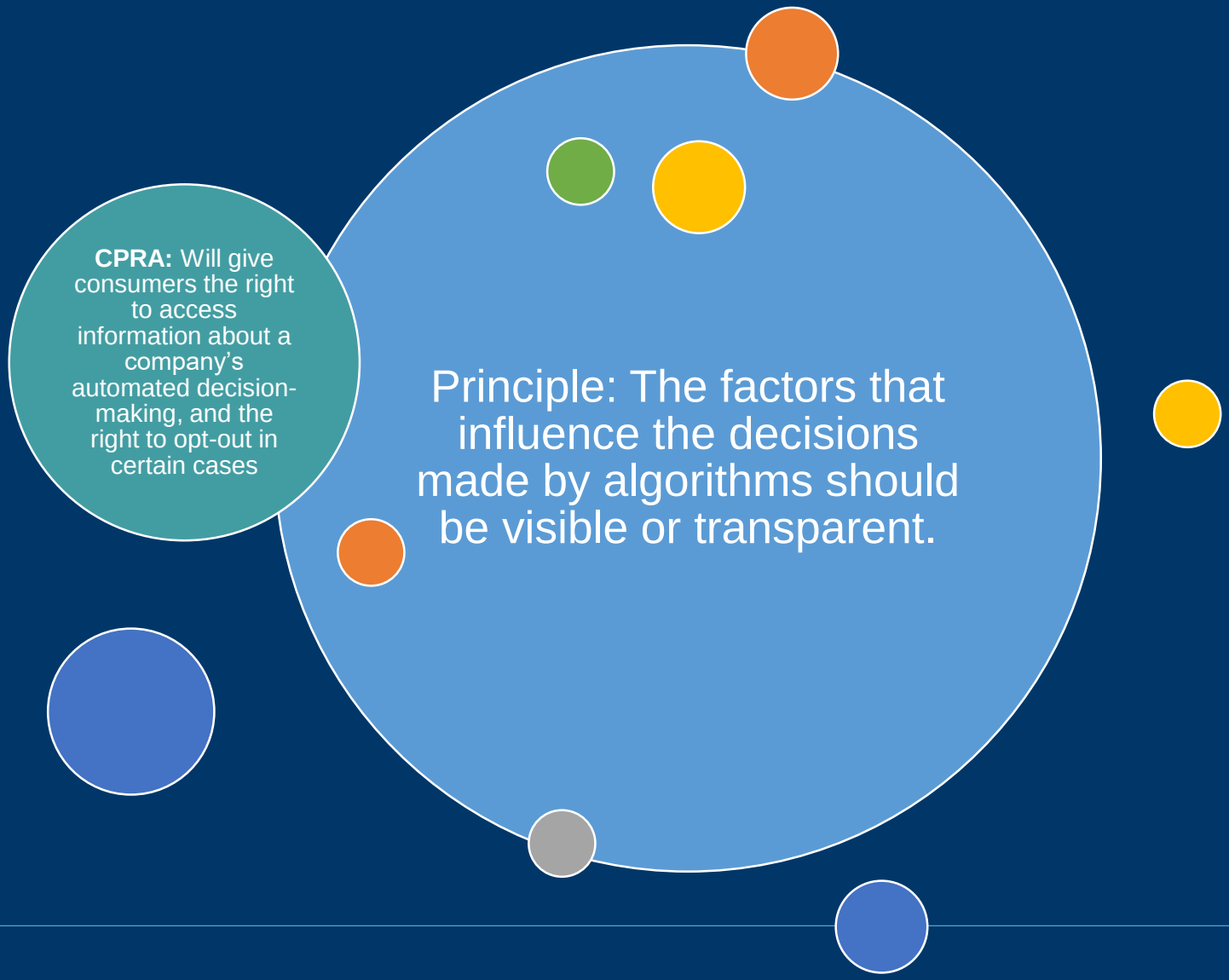
Training Data

Program Design

Outcome Interpretation



TRANSPARENCY: MAKING AI EXPLAINABLE



ACCOUNTABILITY: HOLDING HUMANS ACCOUNTABLE FOR INEQUITABLE OUTCOMES

PRIVACY & SECURITY: APPLYING A PATCHWORK OF LAWS IN THE U.S.

Consumer Rights

- CCPA/CPRA
- VCDPA
- More states on the way

Sector-Specific

- Health Data (HIPAA)
- Financial Data (GLBA, FCRA)
- Children's Data (COPPA)

AI-Specific

- Algorithmic Accountability Act
- Biometric Information Protection Act
- DATA Act
- Facial Recognition Bans

Anti-Discrimination

- Fair Housing Act
- Civil Rights Act of 1964
- GINA

EU Expert Guidance on Trustworthy AI

Trustworthy AI has three components:

- ✓ It should be lawful
- ✓ It should be ethical
- ✓ It should be robust (from a technological and social perspective)

AI IN THE EU: A LONG-AWAITED PROPOSAL

PROHIBITS SOME USE CASES:

- AI that deploys subliminal techniques to distort a person's behavior in a manner that causes that person or another person physical or psychological harm.
- AI that exploits vulnerabilities of a specific group of persons due to their age, physical or mental disability.
- Use of AI by public authorities for social scoring.
- Use of "real-time" facial recognition systems in publicly accessible spaces for law enforcement purposes (with exceptions)

REGULATES BASED ON RISK:

- Requires a risk management system (including risk assessments)
- Strict data and data governance requirements
- Record-keeping requirements
- Post-market monitoring
- Incident reporting of incidents requirements.
- Registration in a central database.

AI GOVERNANCE: CHECKING FOR HARM

- What is the source of the data?
  - Can you verify that it has been ethically/legally sourced?
  - Does it represent a diverse set of inputs?
- Are you using “sensitive” categories of data?
  - Are you using proxies for sensitive categories?
- How will the data be secured?
- What are the use cases?
  - Can you explain the factors that impact the decision-making?
  - Is the data or the use cases covered by any sector-specific laws?
- What population of people will be impacted and how?
  - Can you mitigate any potential harm?
- Is there a human check as part of the system, or an opportunity to appeal automated decisions?
- Are there unintended consequences that may have been overlooked?
  - How will you monitor/audit for harms?

Critical Contracting Issues for AI-based Solutions

Intellectual Property

- Who owns what?
  - Ownership vs. license rights (and scope)
  - Software, methodologies, data, trained models
  - Feedback
- Third-Party Rights
  - Software/Data
  - Are “bots” considers “users”?
- Consider freedom to use/operate for both parties

Critical Contracting Issues for AI-based Solutions

Liability

- A key issue, no one answer
- Errors in data (garbage in, garbage out)
  - Impact of bad data
  - Biases due to wrong assumptions in model/data
- Liability caps reconsidered
  - “Standard” caps may not address customer risk of AI use
  - Vendors desire to balance risk/reward
  - Exceptions need to be carefully addressed

Best Practices for Now – and for What's Next

Understand the Technology

- What type of automation is involved?
  - Avoid the hype – not everything is AI
- What third-party software/data needs to be integrated?
  - Who is responsible for the integration?
  - Is use of AI model permitted?

Understand the Data

- What type of data is involved?
  - Regulated data?
  - Does customer/vendor have the necessary rights

Best Practices for Now – and for What's Next

Understand Your Compliance Obligations

- Government regulations
  - Cross-border, U.S., state, local
- Industry-specific regulations

Ensure the right stakeholders participate

- At a minimum the business line + legal + IT security
- Can implicate HR, Compliance, Finance and Risk Management
- Involve IT security and legal teams early