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Leveraging the Power of AI and Robotics

Femi Osinubi

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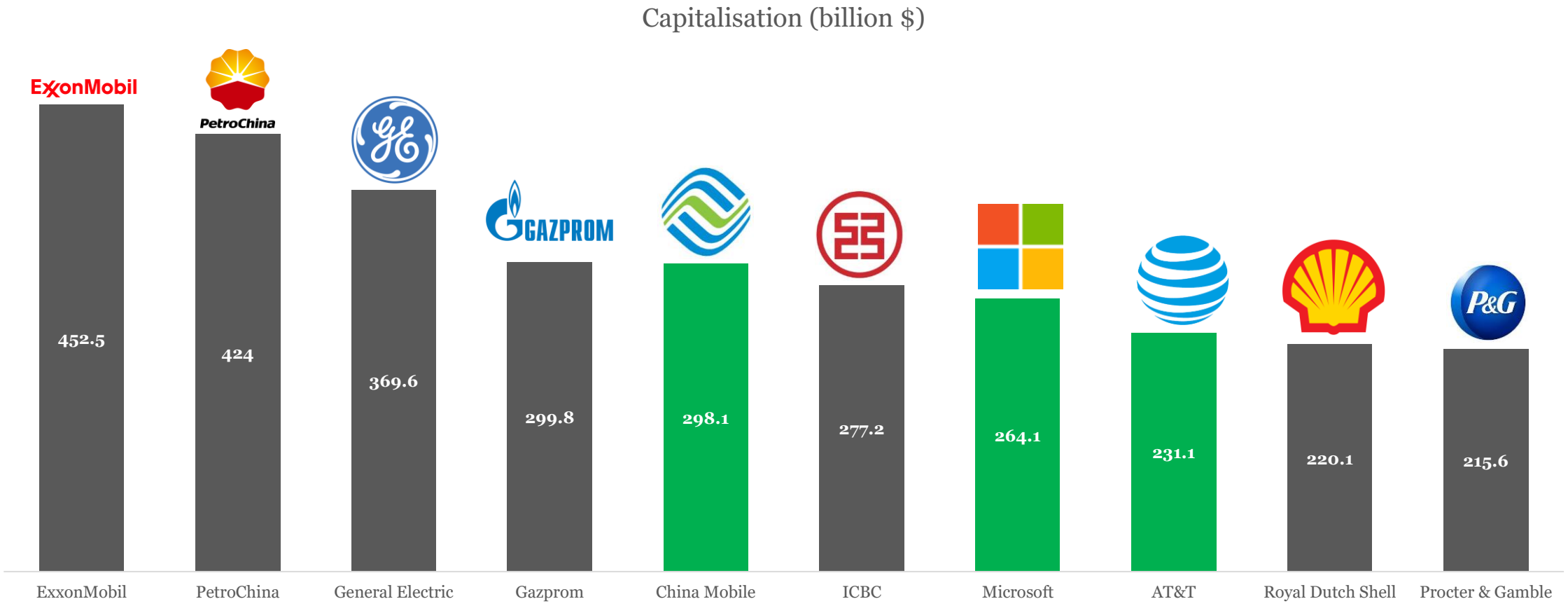
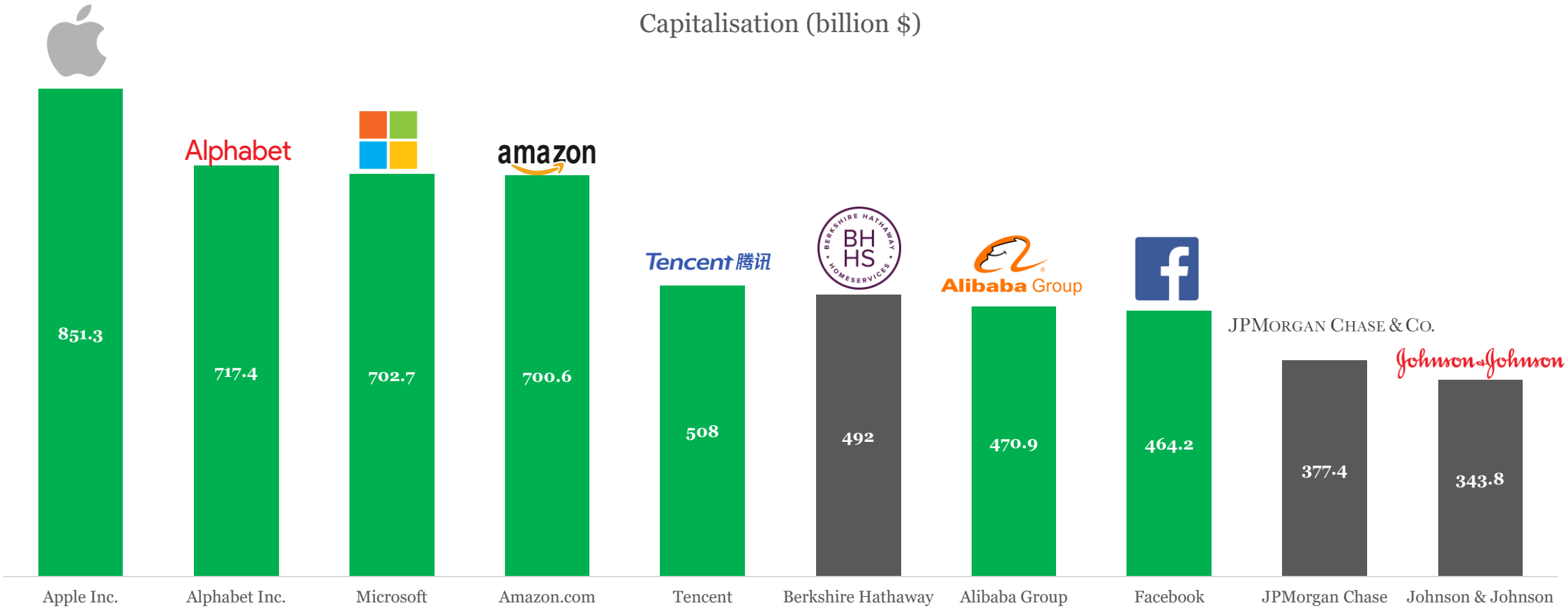
— John Chambers, Executive Chairman, Cisco System



Source: PwC's Global Top 100 Companies by Market Capitalisation



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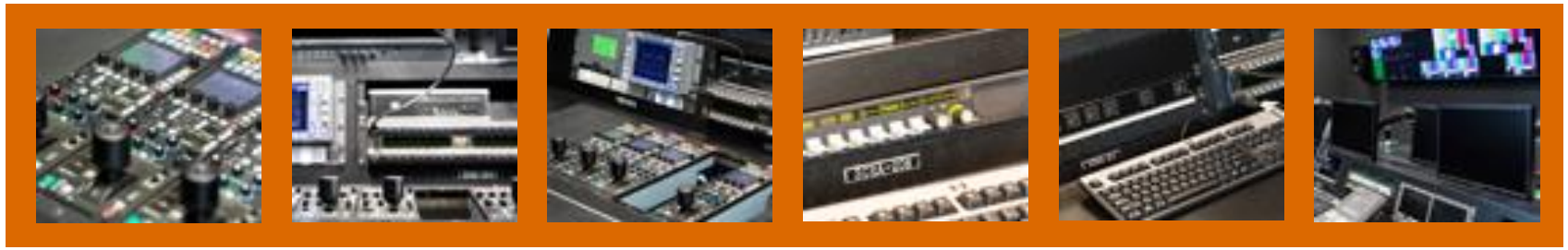
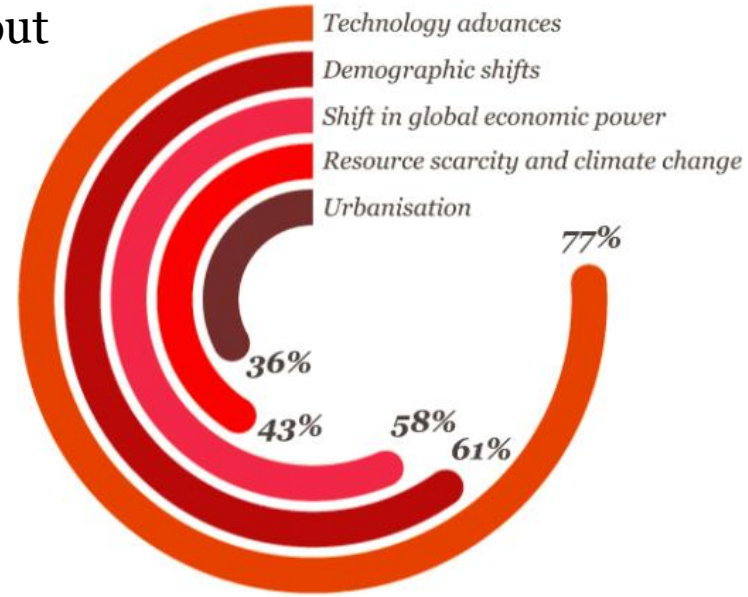


Technological disruption is transforming markets and societies in ways that wouldn't have been possible even five years ago.

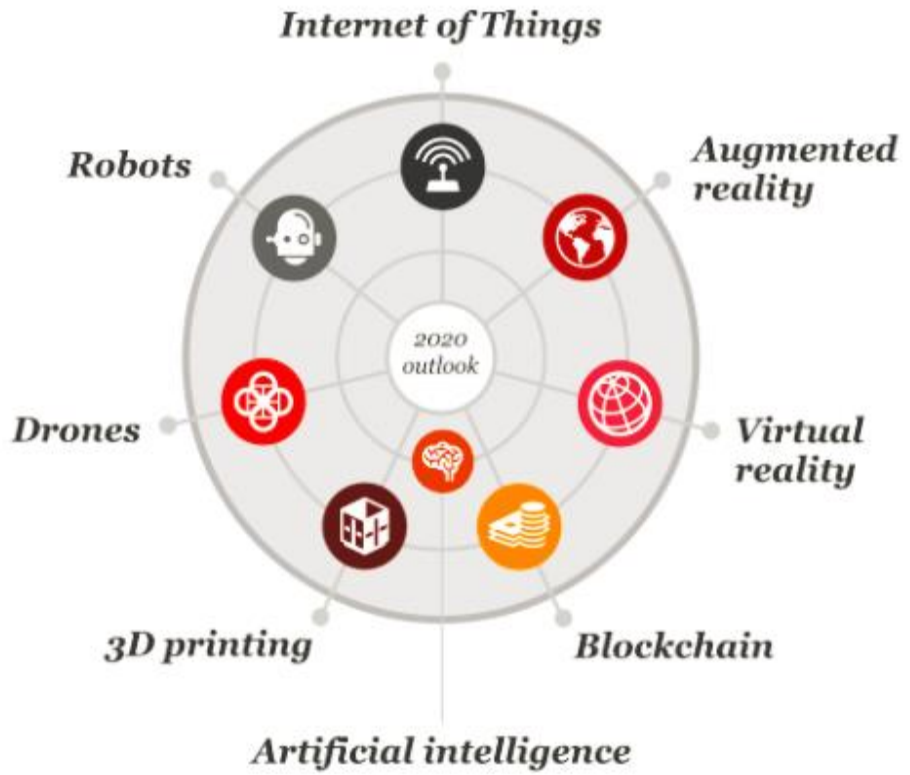
And this opens up huge and still largely untapped commercial potential for domestic and international businesses.

CEOs surveyed as part of our annual Global CEO Survey identified technological advances as the most important trend impacting their business.

They are also concerned about the pace of change.



The trends and innovations that will shape the technology industry over the next several years are coming into sharper focus.



Leveraging the power of
and
is at the core capability for emerging technologies.

Emerging technologies focuses on the end-to-end digitization of all physical assets and processes as well as integration into digital ecosystems with value chain partners.

Addition of information or visuals to the physical world, via a graphics and/or audio overlay, to improve the user experience for a task or a product.

This “augmentation” of the real world is achieved via supplemental devices that render and display said information.

AR is distinct from Virtual Reality (VR); the latter being designed and used to re-create reality within a confined experience.

AR-enabled smart glasses help warehouse workers fulfill orders with precision, airline manufacturers assemble planes, and electrical workers make repairs.

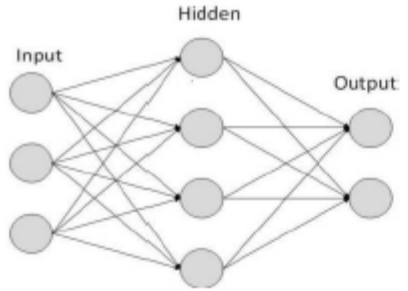
We’re currently seeing mainstream gaming examples of AR that reach across age demographics.

The power of bringing information to the point of action in a seamless, unobtrusive manner is undeniable. This blending of the physical and virtual world is cracking open a new realm for businesses across the board to explore.

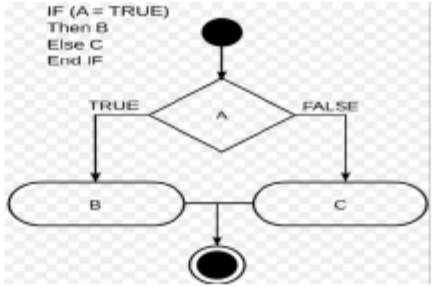
Artificial Intelligence definition: The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.- The New Oxford American Dictionary

Artificial Intelligence works with the help of

Artificial neural network (programming constructs that mimic biological neurons)



Scientific theorems(If-Then Statements, Logics)



Artificial Intelligence **Pros**:

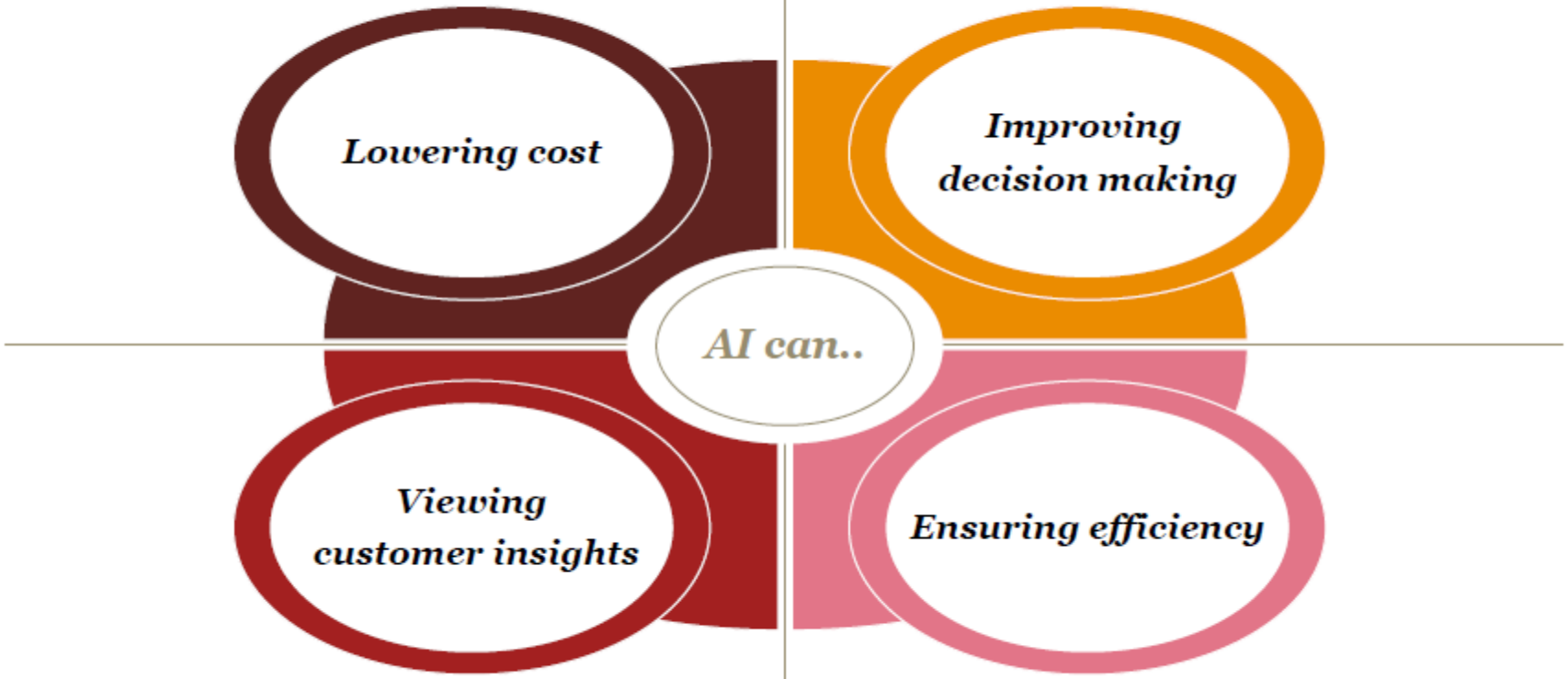
- Be able to simulate human behavior and cognitive processes
- Capture and preserve human expertise
- Fast response.
- The ability to comprehend large amounts of data quickly.

Artificial Intelligence **Cons**:

- No "common sense"
- Cannot readily deal with "mixed" knowledge
- May have high development costs
- Raise legal and ethical concerns

For manufacturing, Artificial Intelligence (AI) optimizes various functions with robotics and automation beyond normal human capabilities and increases productivity by eliminating downtime due to unpredictable changes in the schedule.

With Artificial Intelligence, companies can take more logical decisions by removing human biases and errors. Decision making not only gets free from biases, but will also be faster and more efficient.



Advances in AI can significantly enhance customer analytics to give companies speedier insights into individual buying patterns and a host of other consumer habits.

AI has been widely adopted to increase efficiency across multiple functions – risk management, compliance, and securities trading and monitoring, with an extension into customer relationship management (CRM).

Opportunity

"It is hard to think of any problem that **a superintelligence** could not either solve or at least help us solve. **Disease, poverty, environmental destruction**, unnecessary suffering of all kinds: these are things that a superintelligence equipped with advanced nanotechnology would be capable of eliminating."

-Ray Kurzweil, The Singularity Is Near

Threat

Photo: Corbis

"**Humans**, who are limited by slow biological evolution, couldn't compete, and **would be superseded**."-Stephen Hawking, professor and scientist

Possible solutions

Bill gates talks about why Artificial Intelligence is nearly here and how to solve two big problems it creates

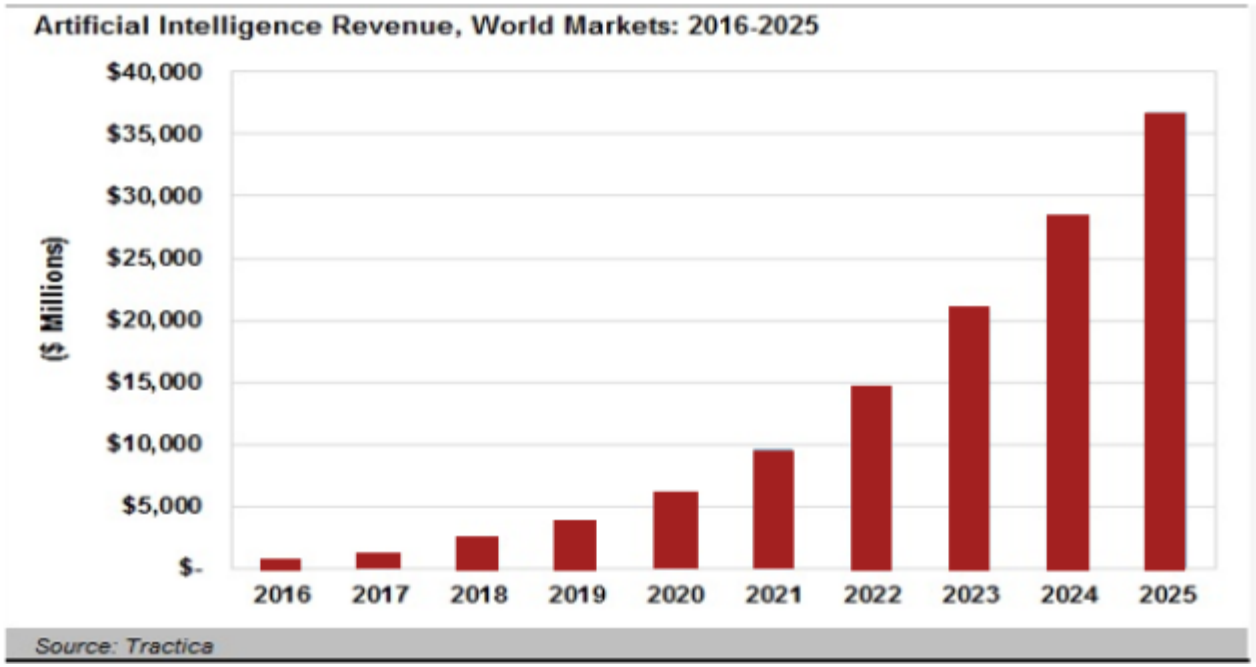
- Job loss
- Human can't control AI

→ High added value job created and enjoy more quality of life

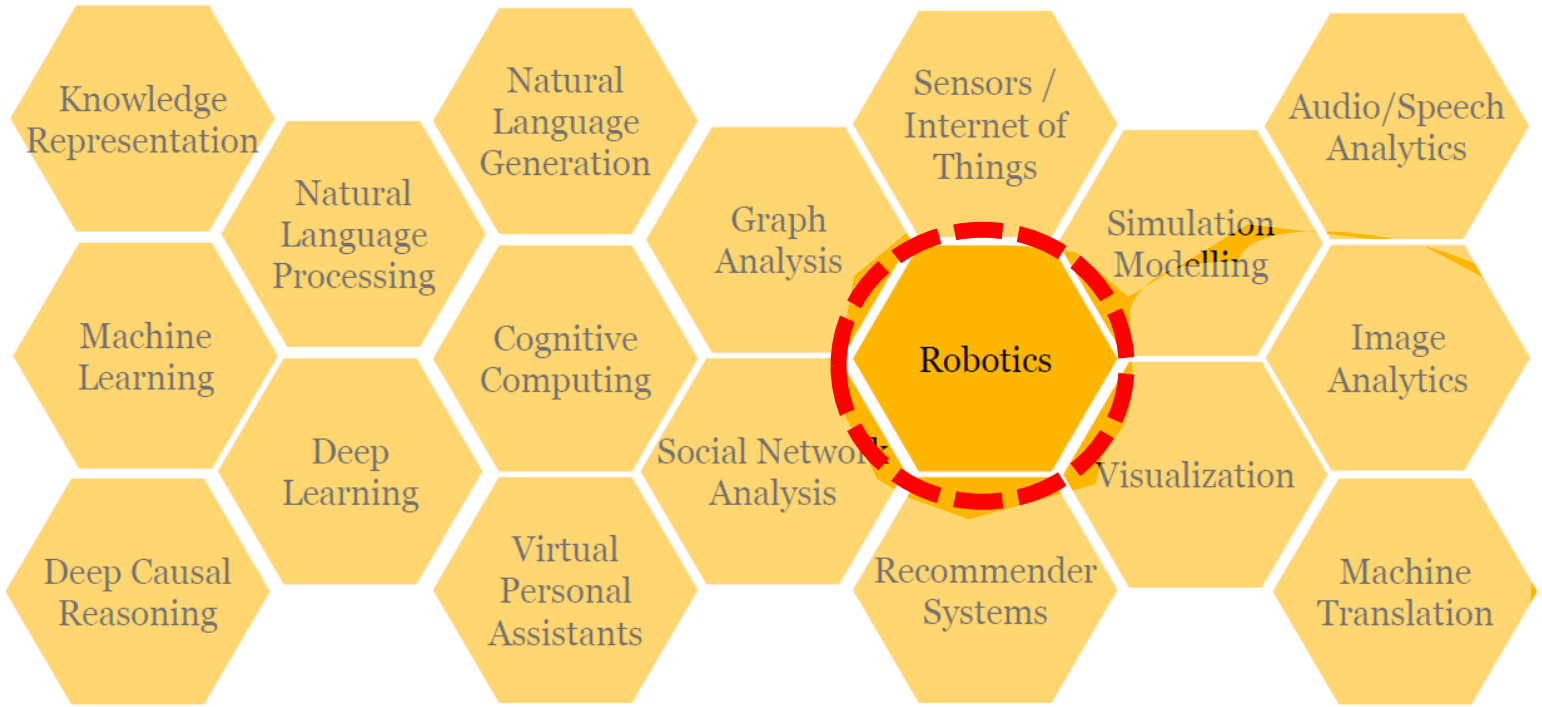
→ Working with various communities/experts for human stay in control

PwC Source: WSJ, Recode.net, Singularityhub.com

- Artificial Intelligence Revenue: $643.7 million in 2016 and $36.8 billion worldwide by 2025
- Consumer products, business services, advertising, finance & investment, media & entertainment, and defense applications will drive significant revenue for AI software implementations in addition to AI-driven hardware and service sales.
- The global cognitive computing market (machine learning) is expected to reach $12.5 billion in 2019, up from 2.5 billion in 2014, at a CAGR of 38%.
- **Image recognition is forecasted to be the fastest growing segment by application** due to the increasing demand for affective computing technology in several end-use sectors for better study of systems that can recognize, analyze, process, and simulate human effects



Topic Areas within Artificial Intelligence (non-exhaustive)



Key focus

“

RPA is the beginning of AI in the enterprise.

Emer Ging, PhD
The Artificial Intelligence Institute

Today — **Future**

The Technology Continuum represents a forward-looking perspective on the evolution of RPA capabilities over time.

The continuum extends from common technologies in use today to potential replacement technologies to be adopted in two to five years [or more] in the future.

The continuum is further classified into Current State, Trending, and Future State technologies along its axis.

Macros and Scripts

- **Rules-based automation within a specific application** (e.g., Excel) to provide users with a way to automate a repeatable process with highly structured data

Business Process Automation (BPA)

- **Reengineering existing business processes** by using software, integrating systems, and restructuring labor to optimize workflows and minimize costs

Robotic Process Automation (RPA)

Alias: Robotic Desktop Automation (RDA)

- **Automating labor-intensive, repetitive activities across multiple systems and interfaces** by training and/or programming third-party software to replicate a user's workflow
- Operates at the presentation layer without the need to change existing systems
- Users intervene to handle exceptions as they arise

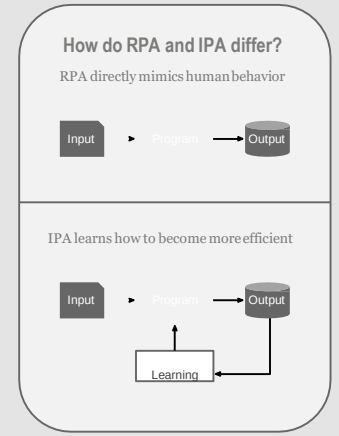
Intelligent Process Automation (IPA)

Aliases: Cognitive Computing, Smart Workflows

- **Combining RPA with artificial intelligence technologies** to identify patterns, learn over time, and optimize workflows
- Through "supervised" and "unsupervised" learning, algorithms make predictions and provide insights on recognized patterns
- With IPA, robots can replace manual clicks (RPA), interpret text-heavy communications (natural language processing), make rule-based decisions that don't have to be pre-programmed (machine learning), and offer customers suggestions (cognitive agents)

Algorithmic Business

- **Industrialized use of complex mathematical algorithms** to drive improved business decisions or process automation for competitive differentiation



TECHNOLOGY STATE — Current State — Trending — Future State

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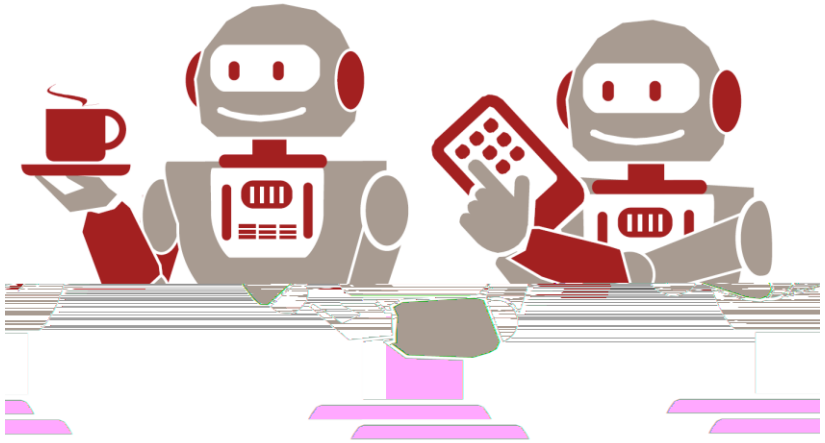
	Macros and Scripts	Business Process Automation (BPA)	Robotic Process Automation (RPA)	Intelligent Process Automation (IPA)	Algorithmic Business
Example Providers	Access, Excel	spicecsm, KOFAX, Pega	Automation Anywhere, UiPath, blueprism	WorkFusion, Google DeepMind, IBM Watson	N/A
Applicability	Activities that are repeatable within a specific application (e.g., Excel), providing the user with a way to automate a repeatable process with highly structured data	Processes that use multiple systems together with specified logic e.g. providing customer service by different teams	Labor-intensive repetitive activities that need significant amount of data processing will benefit through RPA without the need to change existing systems	Use of artificial intelligence is increasing in areas where a vast array of data processing is required to make decisions while considering the overall context	Internally developed and externally sourced algorithms used in multiple business situations – from providing customer with customized products to processing back-office transactions
Use Cases	Import, manipulation, and export of customer purchase histories to conduct basic analyses	Integration of internal business functions, such as Finance, HR, and Marketing, to streamline operations and reduce cost	Automating common tasks in customer service centers, such as incident management, billing queries, user admin and updating records	Transaction monitoring and fraud prevention by identifying patterns in behavior that could indicate fraudulent payment activity	Airline yield management programs constantly monitoring supply and demand to maximize revenue for a given seat inventory
More Information	Programming in Excel (Macros)	What Is Business Process Automation (And How Can It Help Your Business)? Business process automation: Where it works, and where it doesn't	What is Robotic Process Automation? Why robotic process automation adoption is on the rise Robotic process automation: A path to the cognitive enterprise	Intelligent process automation: The engine at the core of the next-generation operating model AI, Deep Learning, and Machine Learning: A Primer	What Does Algorithmic Business Really Mean, Anyway? 4 industries that use the algorithmic business model successfully

Robotics is described as Robotic Process Automation (RPA), humanoid robots or virtual agents, which automate, improve and/or assist human activities. Furthermore they may analyze applications for processing transactions, manipulating data, triggering responses and communicating with other digital systems.

Robotics can either operate in compliance with a set of predefined instructions or autonomously. Once viewed as quite costly, the technology is increasingly affordable and user-friendly for businesses today.



Benefits

- Automate business operations
- Boost efficiency
- Quality and repeatability
- Free up humans for higher-value tasks
- Replace or augment humans in jobs where there are no labour shortages

Risks

- Lack of expertise and support
- Fallout from job losses
- Regulatory compliance
- Costs

Potential Applications

- Manufacturing
- Hazardous industries
- Hotels and tourism
- Service industry
- Automation of predictable tasks
- Data management

Robots are…

Computer coded software
- Non-invasive, zero change integration on target system and security
- Operate on top of other existing software

Mimic interactions of users
- Record and automate user interactions with one or more software applications
- Interact with the user interface (UI) of existing applications in the same way that an everyday user would

Work cross-functional and cross-applications
- Are entirely technology agnostic and can be used with any application (e.g. ERP, DB, MS Suite, ASCII file, structured PDF, thin clients such as Citrix)
- Use a central repository for easy management of automation scripts and processes

Enable the automation of repetitive, rule-based processes
- Build workflows with dynamic decision/branch points and loops for scaling (up/down)
- Ability to granulize processes into smaller components to allow reusability

Automation will significantly change today's jobs

Technological breakthroughs - The impacts of digital disruption are now so pervasive that no business in any sector is immune from them (PwC)

53% of all occupations are estimated to be replaced by digital technology within the coming twenty years. That is almost 300 million jobs within the OECD-region (Swedish Foundation for Strat. Research)

15 million U.K. jobs are in danger of being taken over by robots (Bank of England)

About **35%** of current jobs in the UK are at high risk of computerization over the next 20 year (BBC)

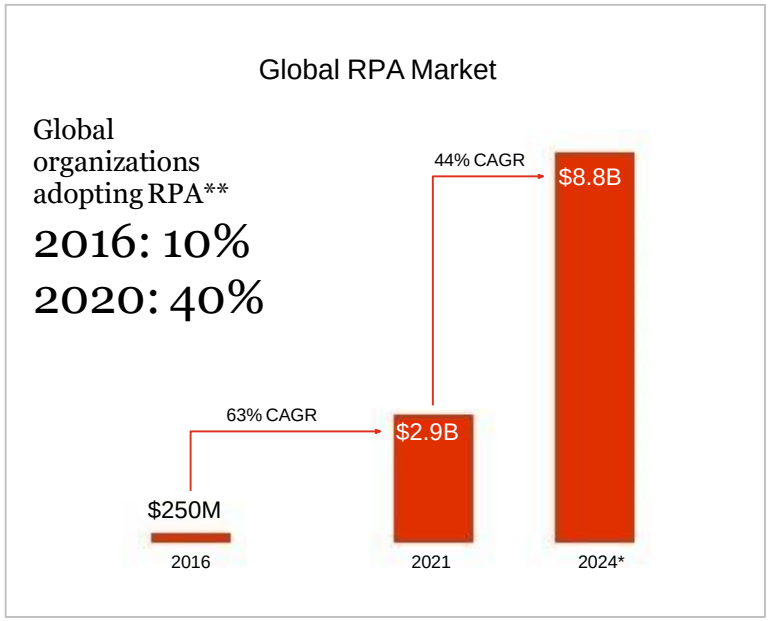
"In the near future, managed services offerings leveraging autonomics and cognitive platforms will permanently remove head count to drive a **60%** reduction in the cost of services (Gartner)

Eighty million U.S. jobs at risk from automation (US Central bank)

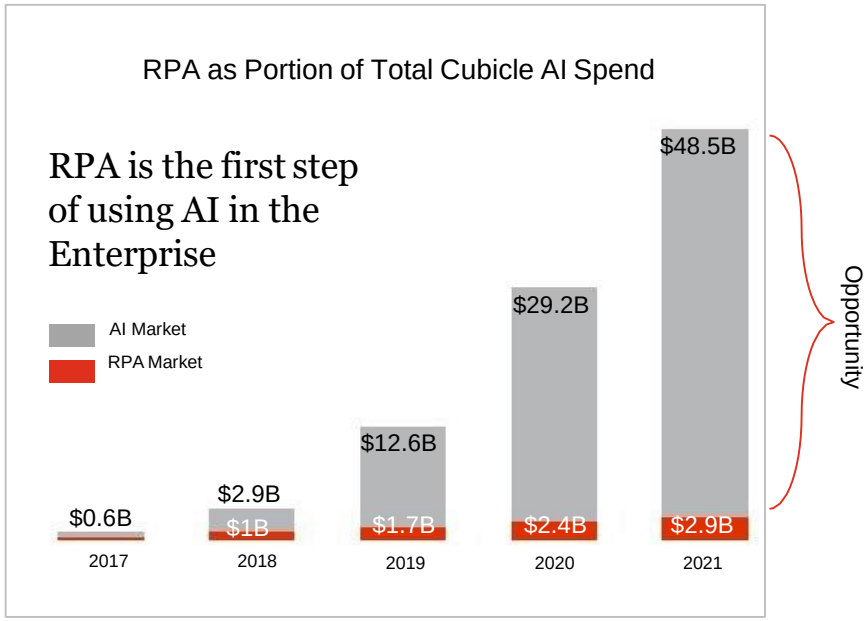
Oxford University predicts that **45%** of jobs will be automated by 2030

What can it do?	What does it need?
• Match invoices to PO's	• Electronic documents
• 'Read' contracts	• Structured Data
• Continuously check if transactions are still 'in compliance'	• Rules-based processes
• Send and receive messages	• Reprogramming when circumstances change
• Compare records or tables across multiple applications	• User access rights across applications
• 'Learn' how to respond to events or occurrences	• Programming on how to deal with events or occurrences
• Automate activities across an end-to-end process	• Re-engineering of processes to efficiently apply the 'bot'

Breakneck RPA growth is expected…



… but it's only the tip of the iceberg.



Source: Forrester, February 2017
*Source: Grandview, October 2016
** Source: Gartner, December 2016

Benefits of Robotic Process Automation

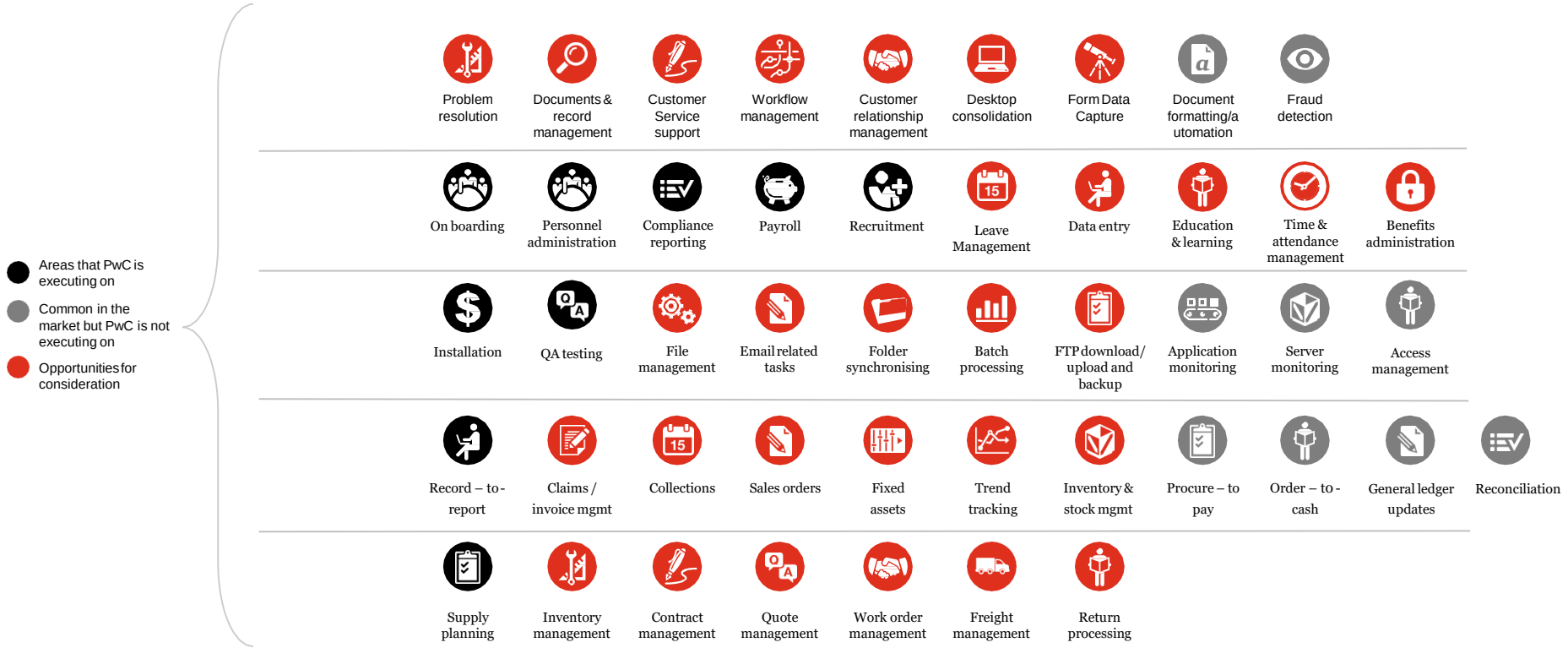
- Cost saving potential
- Productivity - 24/7 with high-speed
- Accuracy - Improve quality with 100% accuracy on automated cases
- Scalability –scalable automations, with the ability to handle increased volumes at marginal cost
- Compliance – Robots follow defined rules and have same rights as humans
- Security – data protection and audit trail proved

The case for RPA

- Short-term realization of efficiencies
- Interim solution for quick fixes and improvements
- No requirements for business case and expertise of large ERP changes and/or existing IT landscape

RPA value proposition

- Easy and fast to implement
    - Low investment required (compared with large ERP/system initiatives)
    - Fast go-live (weeks rather than months)
    - Less effort to design the robot (about 1 week)
- IT landscape agnostic
    - Non-invasive - no changes or additional coded interfaces in existing IT landscape/apps (on-top layer)
- Cross-functional applicability
    - Interaction between multiple systems, apps and communication tools
- Short payback
    - Between 12-18 months



Examples - not exhaustive

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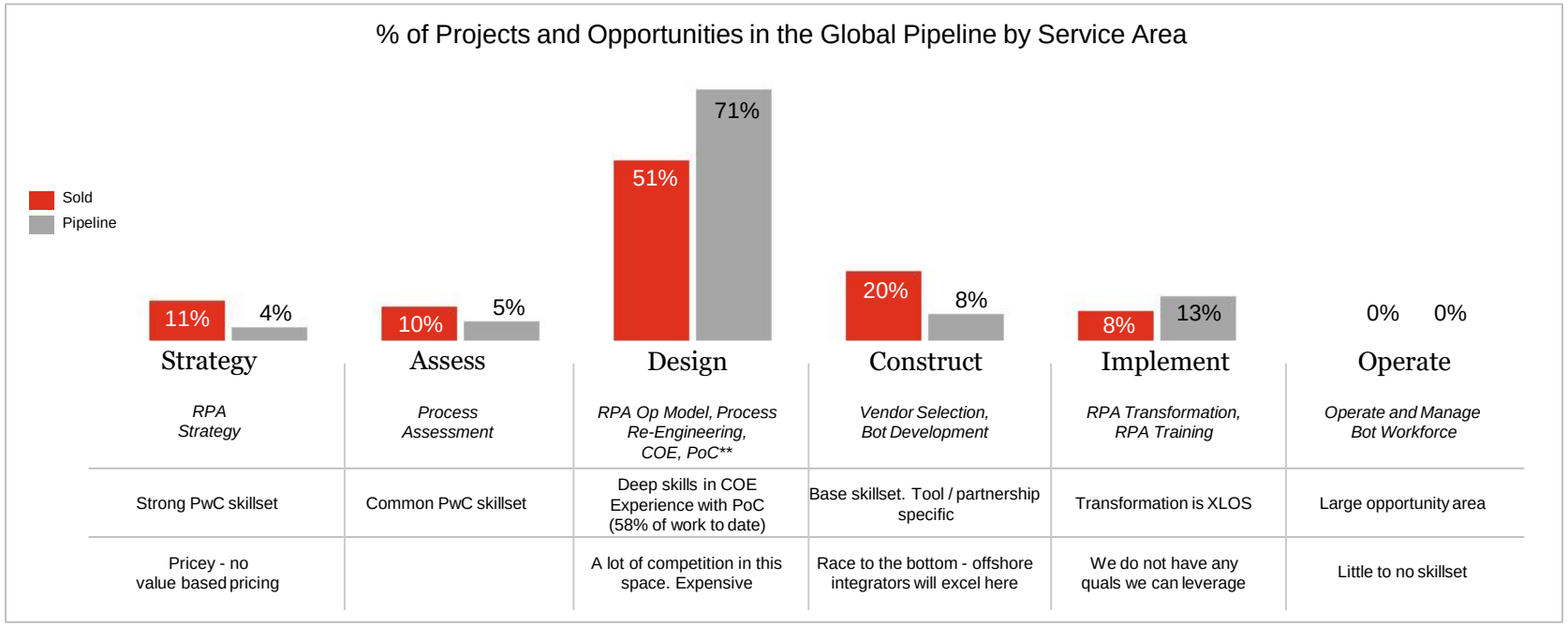
To date, PwC has sold 75 RPA projects with estimated revenues of $8-15M



Source: Global Pipeline
** 50% of total pipeline is PoC

Pipeline information was self-reported and not validated

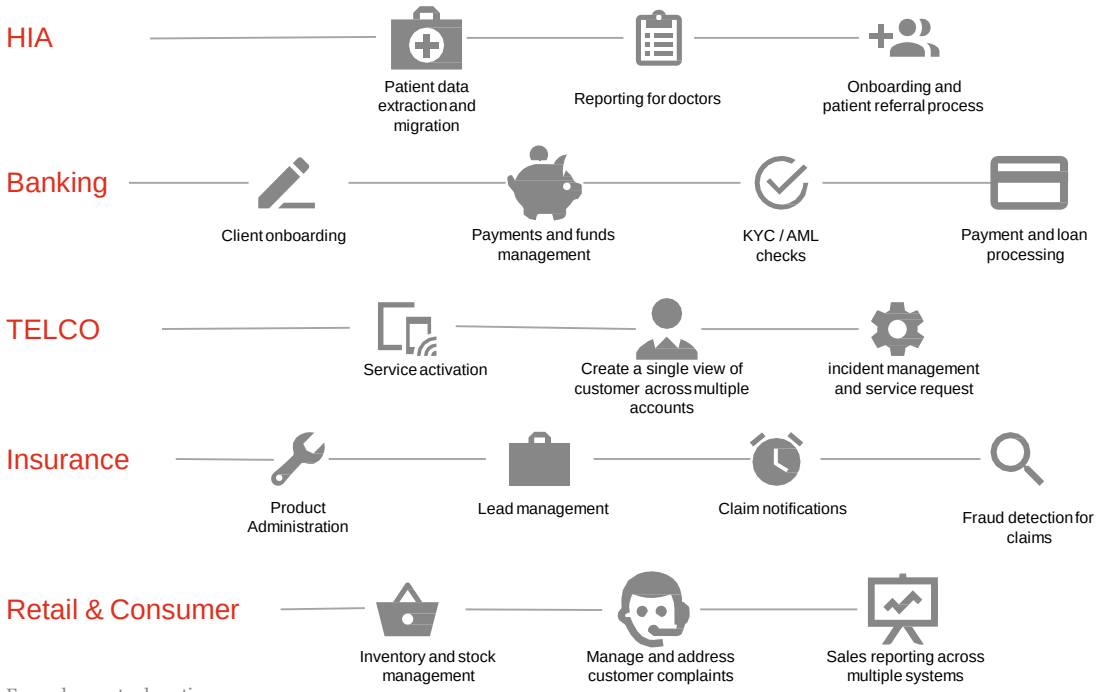
Attributes of good process automation candidates:

- Combine steps **across multiple software applications** that are not integrated ("swivel chair" processes)
- Are highly standardized and rules-based with **limited complexity and exceptions**
- Require a high degree of **consistency and quality**
- Have a **high volume**, requiring large commitment of time or people to repetitively execute

Examples - not exhaustive

Attributes of good process automation candidates:

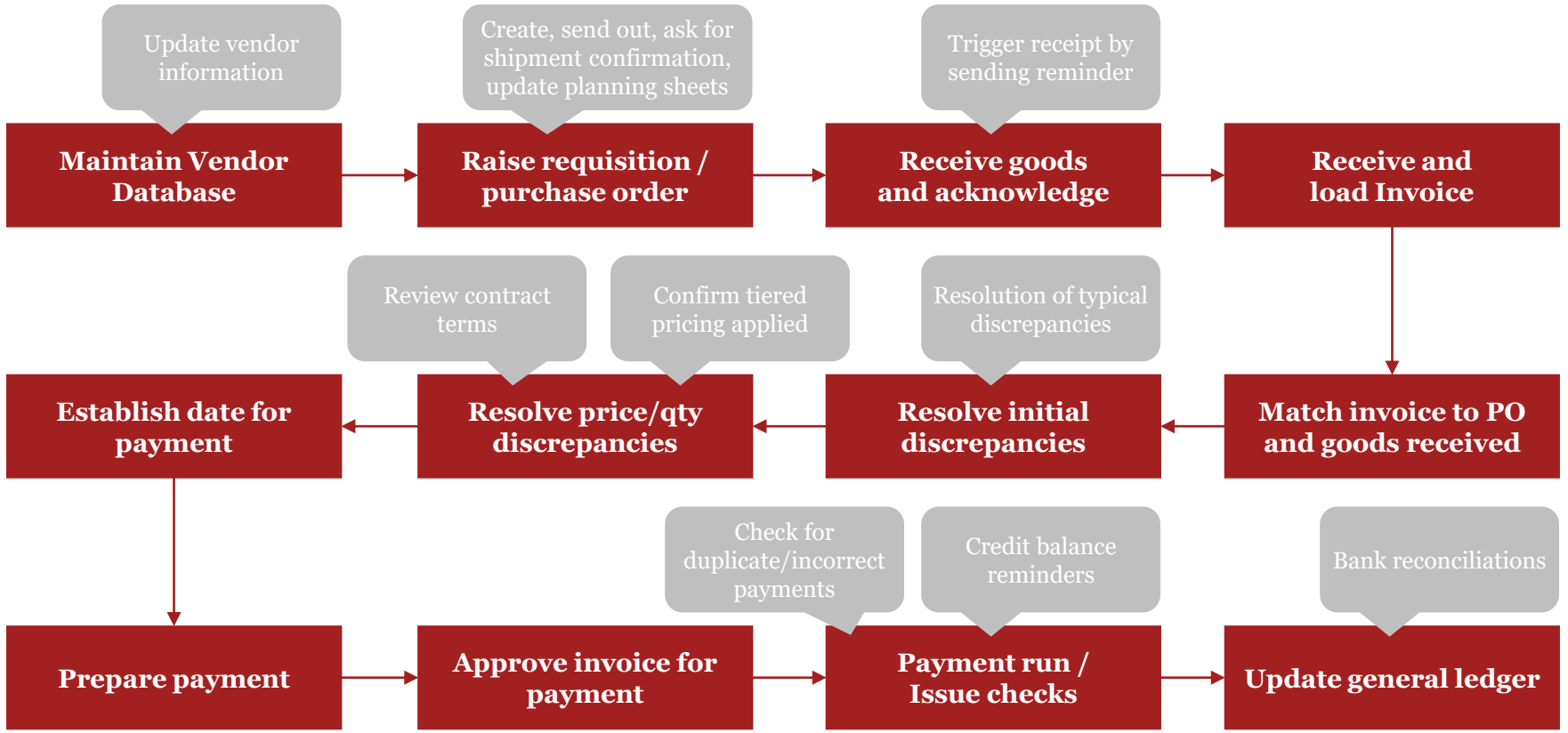
- Processes where there is a **defined workflow** with manual inputs that can be replaced with digitization
- Processes where **more than 10 FTEs** are performing the same activity
- **Stable IT systems** that are not expected to change in the mid-long term



Examples - not exhaustive

RPA

Look for activities that are **: labor-intensive,** require **accessing multiple systems,** are **repetitive** or can be audited for **compliance** periodically



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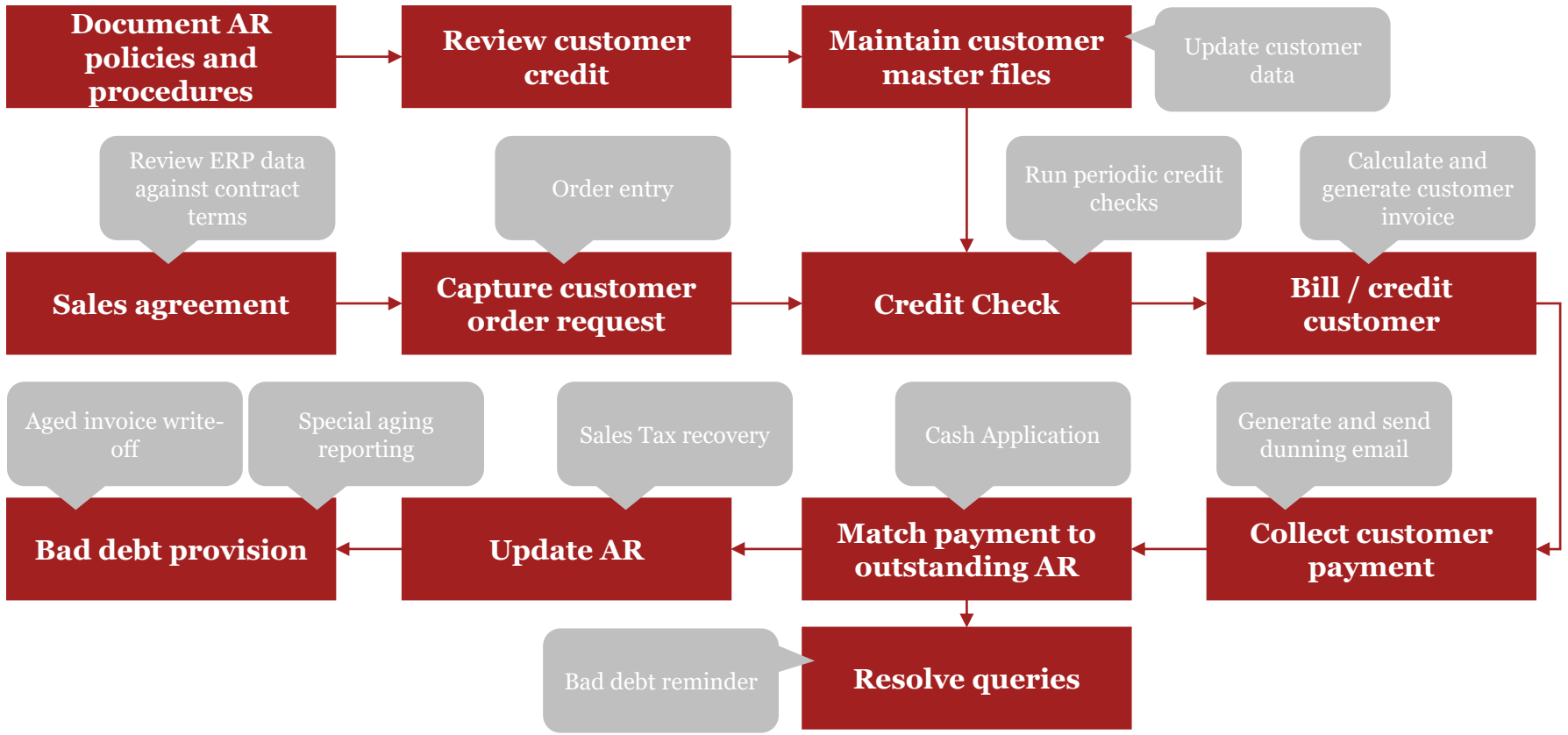

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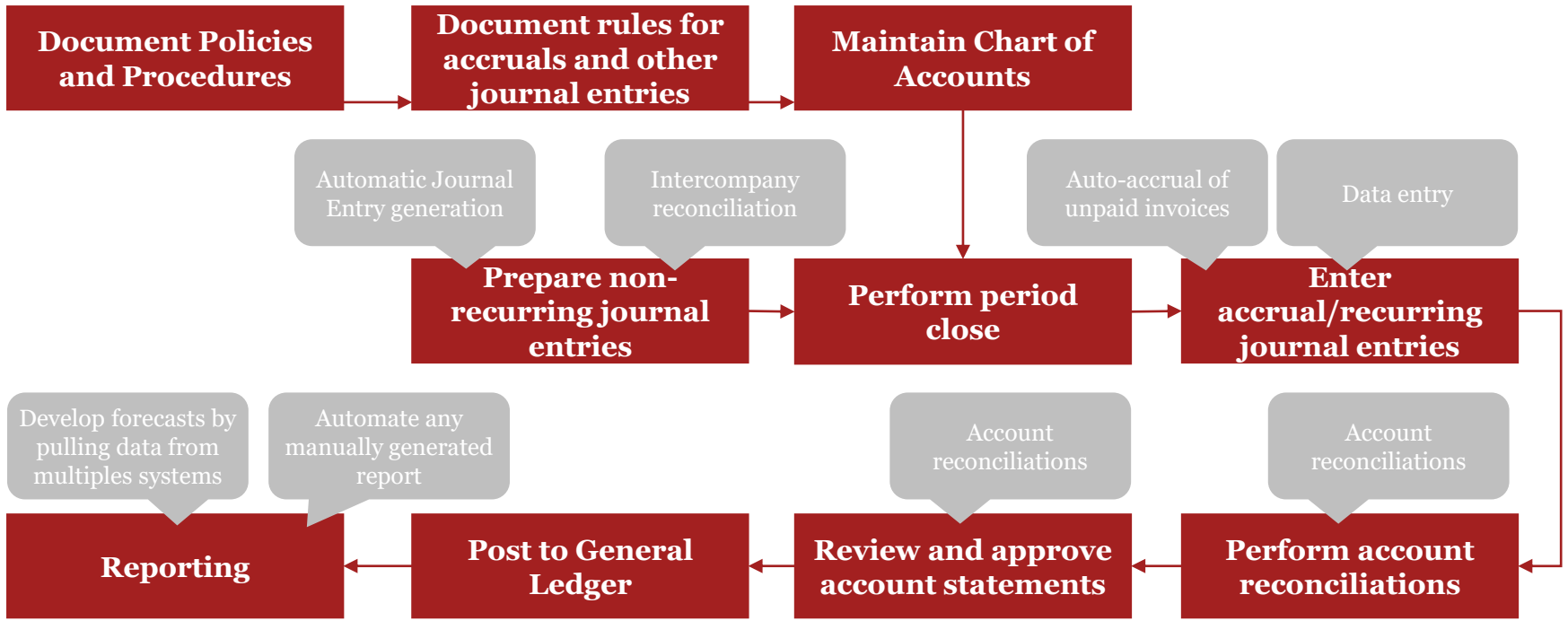


Strategy

These technologies are opening up a slew of new opportunities and corresponding considerations.

Operations

Artificial intelligence, robots, drones, and 3D printing can all improve operational efficiency and provide significant competitive advantage

Customer Engagement

These technologies are already reshaping almost every dimension of companies' interactions with their customers, from sales and marketing to billing and after-sales support.

Compliance

This is an often overlooked aspect of the business model. We believe these emerging technologies will see many companies scrambling to adapt to - and trying to influence - the resulting regulatory landscapes. The regulators themselves are likely to be in a catch-up mode for a while.

People and Talent

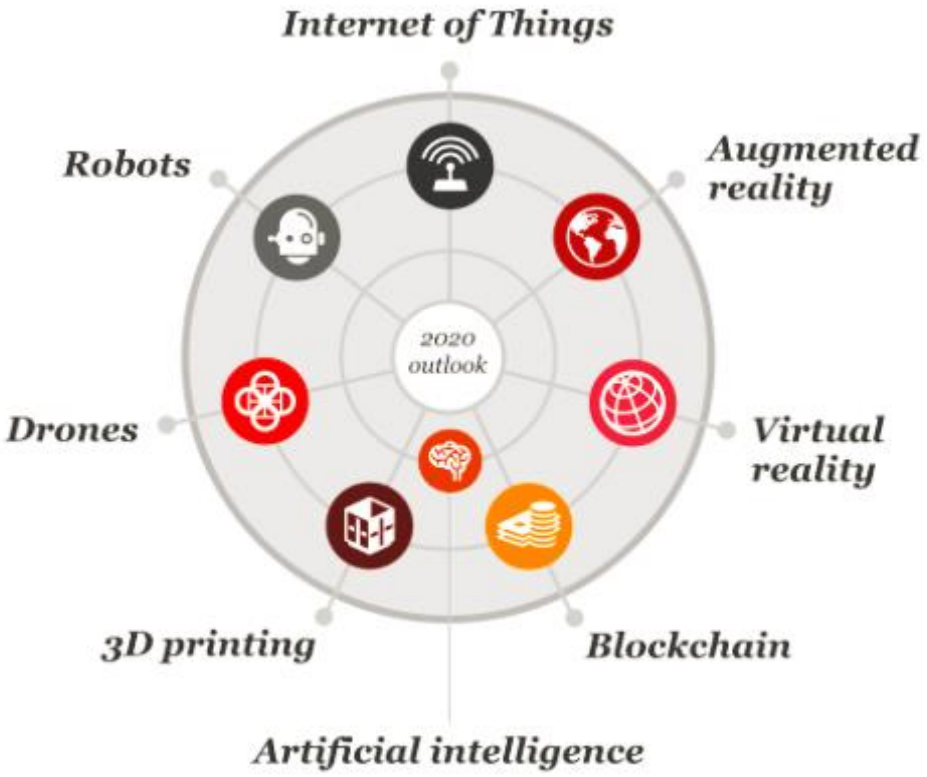
The eight technologies are creating brand-new job categories, but a worrying consequence may be slower job growth. Concurrently, new technologies beget new companies and new job categories.

Reduced costs
Using data to truly understand the business and leveraging automation to drive efficiency across business processes.

Increased quality
Leveraging the power of RPA, is the best way to go, when you have to get it right every time.

Available 24/7
Capable of processing around the clock completing the work that, up, until now, humans have been doing

High scalability
An easily expandable workforce, instantly trained and deployed



Increased Productivity
Resources can now focus on more value-added tasks as RPA can take up the time-consuming and repetitive tasks

Increased Compliance
RPA tool provides full audit trail of processes performed and are rule-based

Non-invasive Technology
There is no need to change the underlying systems or technology as RPA is deployed on top of the systems and applications

Insights and Analytics
Insights to drive and transform the business can be generated from the increasing data footprints both internally & externally.

The winning formula

Strategy formulation

Knowing where to apply RPA and D&A is the key to success.

This starts with formulating an **enterprise-wide strategy**, develop a **roadmap** and **governance framework**.

Implementation

Having a laid out plan is just the beginning of the journey.

Next is to **develop & implement** the **Analytics & Digital strategy**.

Quality Assurance

To ensure you realize the benefits of your digital strategy.

Assurance that current **RPA initiatives/projects** are carried out in line with **best practices** to achieve management's expectations is also very key.