# Cognitive Procurement

Bernardo Nicoletti

# Objectives of This Lesson

- Explore cognitive technologies applied in procurement
- Understand what is done under cognitive procurement
- Investigate future tendency of cognitive procurement

# Challenging Environment ... The 6Cs

## Customers

Empowered and demanding

Complex and confused

Sometimes Malicious

## Competition

Non Bankers

## Computers

New Technology

Network

## Costs

ROE (EU 0% vs AS 17%)

Europe (68%=>46%)

Outsourcing

## Compliance

Security and Frauds

Laws and Regulations

GRC

## Culture

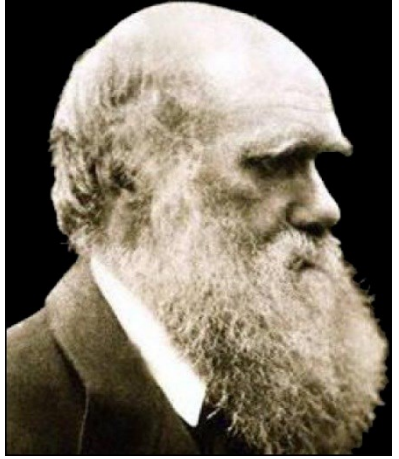
Customer-oriented

Balance the interests of shareholders and society

Lean and agile

**Achieving procurement processes in a leaner and more digitized manner**

# Evolve or Die



**"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change."**

*Attributed to Charles Darwin*

*How important have innovations been to meeting revenue targets over the past 1 to 3 years?*

| | For my company[1] | For my competitors |
|---|---|---|
| Extremely important | 17 | 13 |
| Very important | 40 | 52 |
| Somewhat important | 29 | 28 |
| Slightly important | 12 | 6 |
| Not at all important | 4 | 1 |

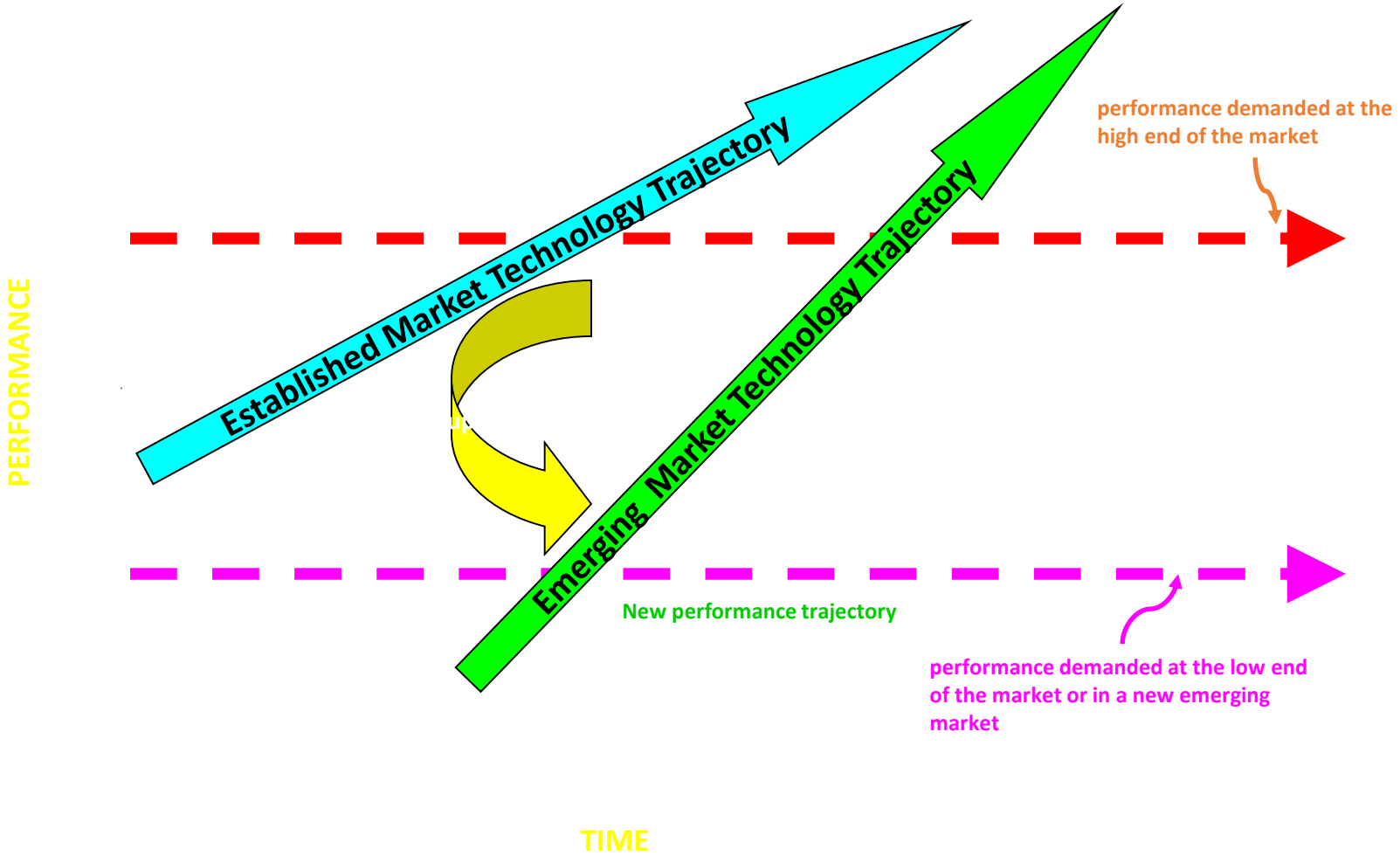
[1] Figures do not sum to 100%, because of rounding.

Source: January 2007 *McKinsey Quarterly* survey of finance executives

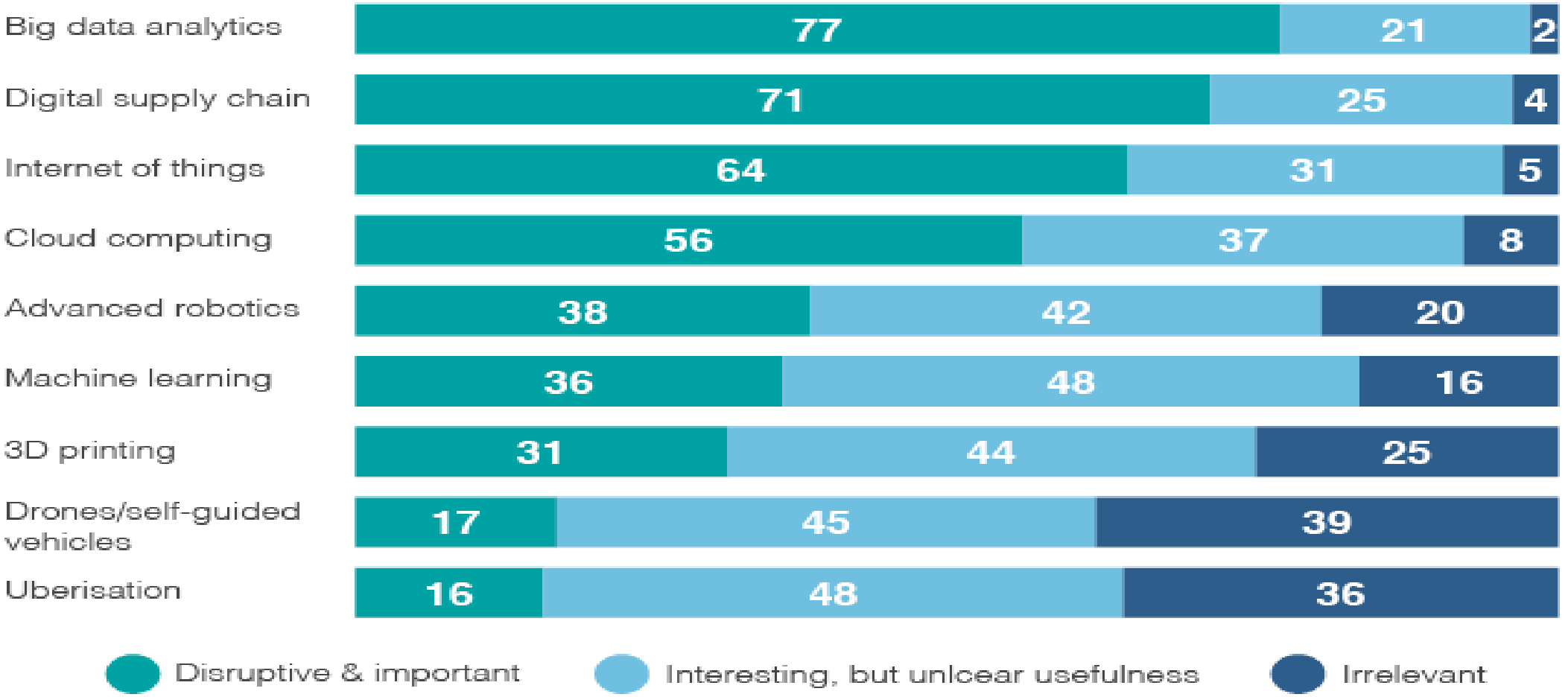
# Disruptive Technologies

- ***Sustaining*** – Steady, linear  improvement of existing technology
- ***Disruptive*** – Introduction of  completely new approaches that have the potential to create a new industry or transform an existing one
  - Revolutionary – radical innovations
    - digital photography, microbots, high-temperature superconductors
  - Evolutionary – formed by the convergence of previously separate research areas
    - MRI imaging, faxing, electronic banking

# Dilemmas of Disruptive Technology



# Importance of Distruptive Technologies




Source: SCM World Future of Supply Chain survey 2015

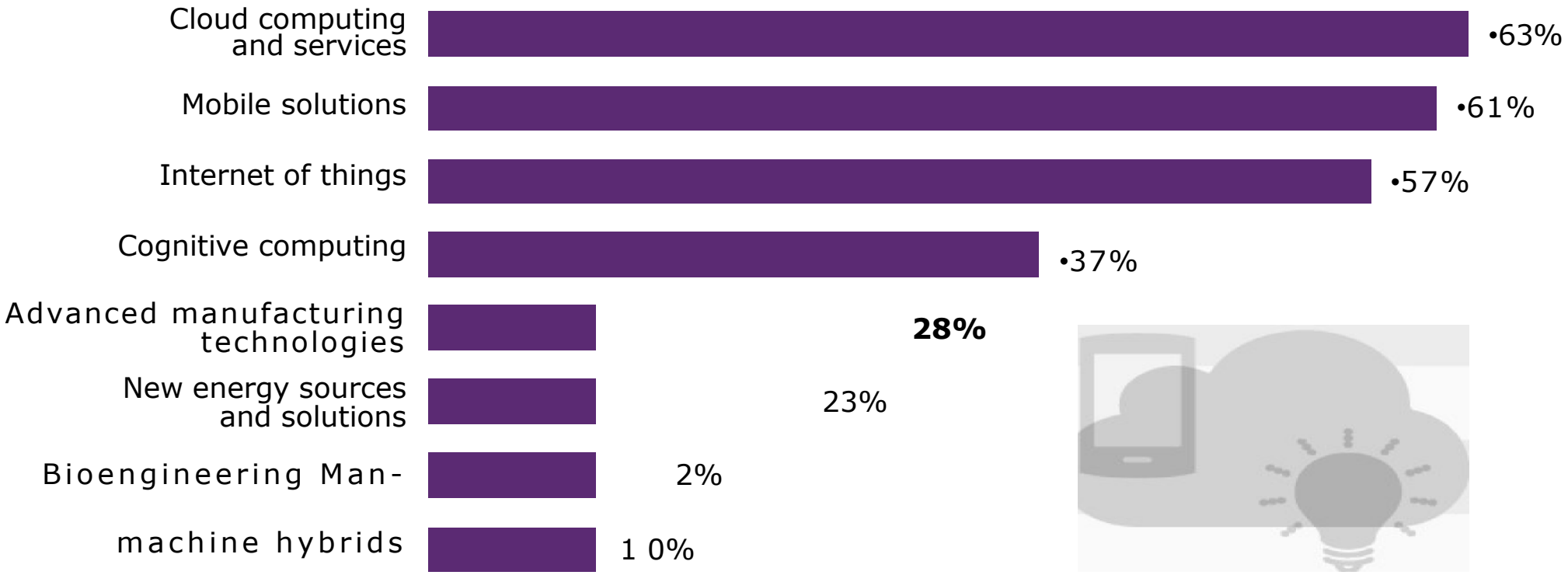
% of respondents
n=1,018

# Digital Transformation

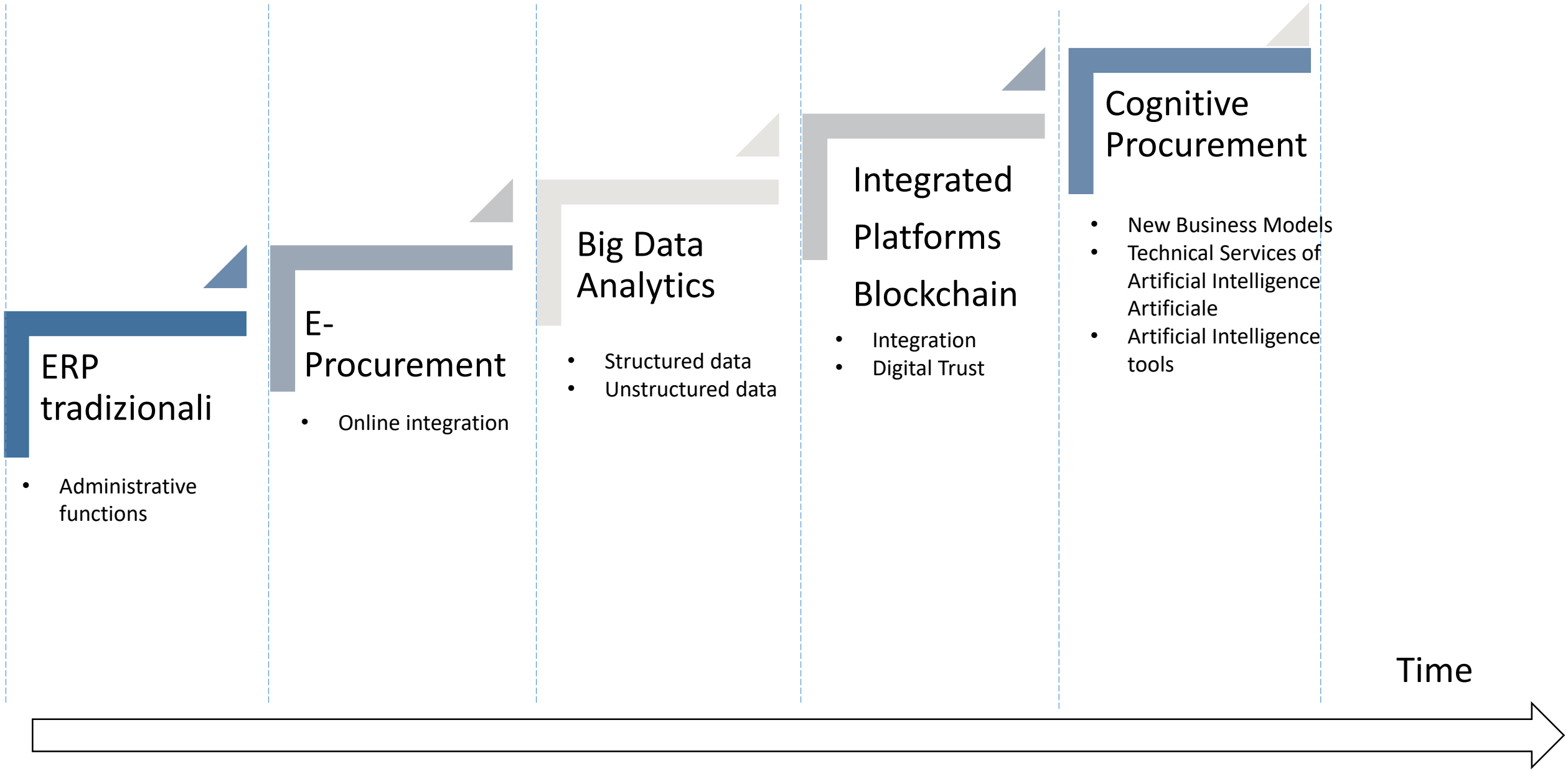
A set of predominantly technological, cultural, organizational, social, creative and managerial changes.

1. Solutions, not just technologies. Not only new technologies, it makes it possible to provide services, provide solutions, bring experiences to life, find, process and make accessible large amounts of content regardless of the real availability of resources, pervasively creating new connections between people, places and things.
2. Integration. The digital transformation process integrates and involves the entire ecosystem touched by the organization, encouraging transparency, sharing and inclusion of all participants.
3. Customer-centric. Thanks to this new approach, the final recipient of the value created at the center of development.

# Technologies which will Shape the Near Future

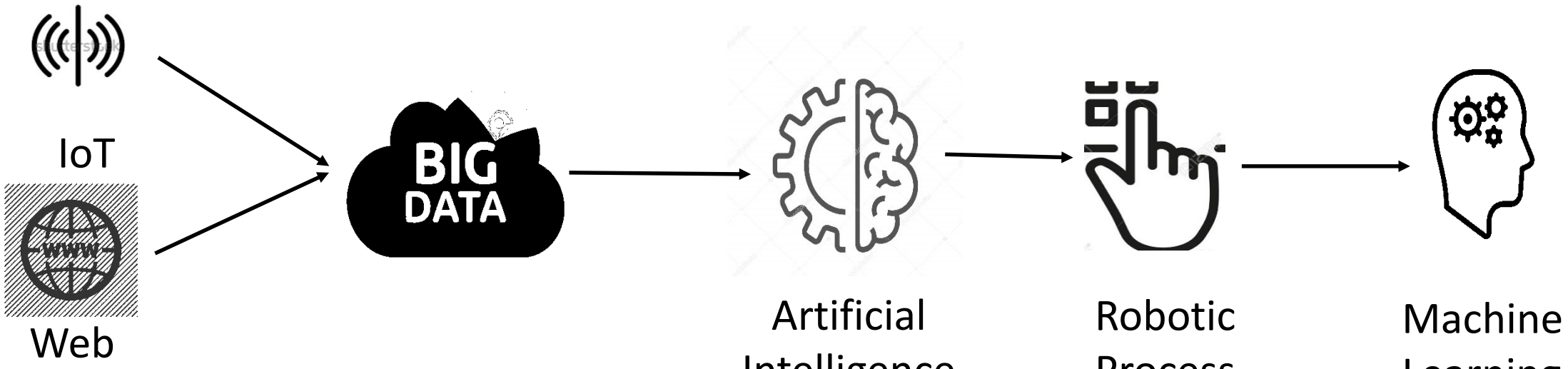


# Procurement Digital Transformation



# Cognitive Technology

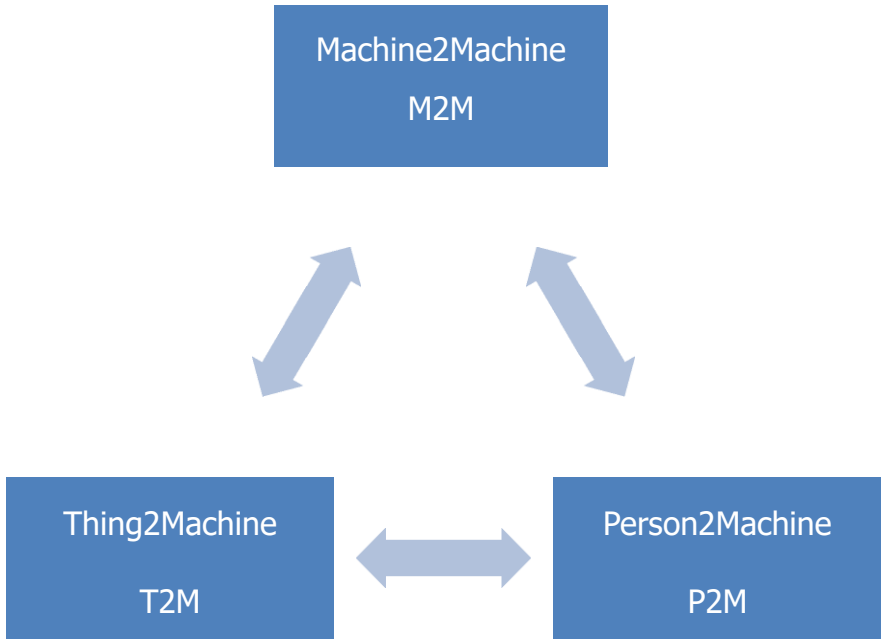
# Cognitive Integrated Technologies

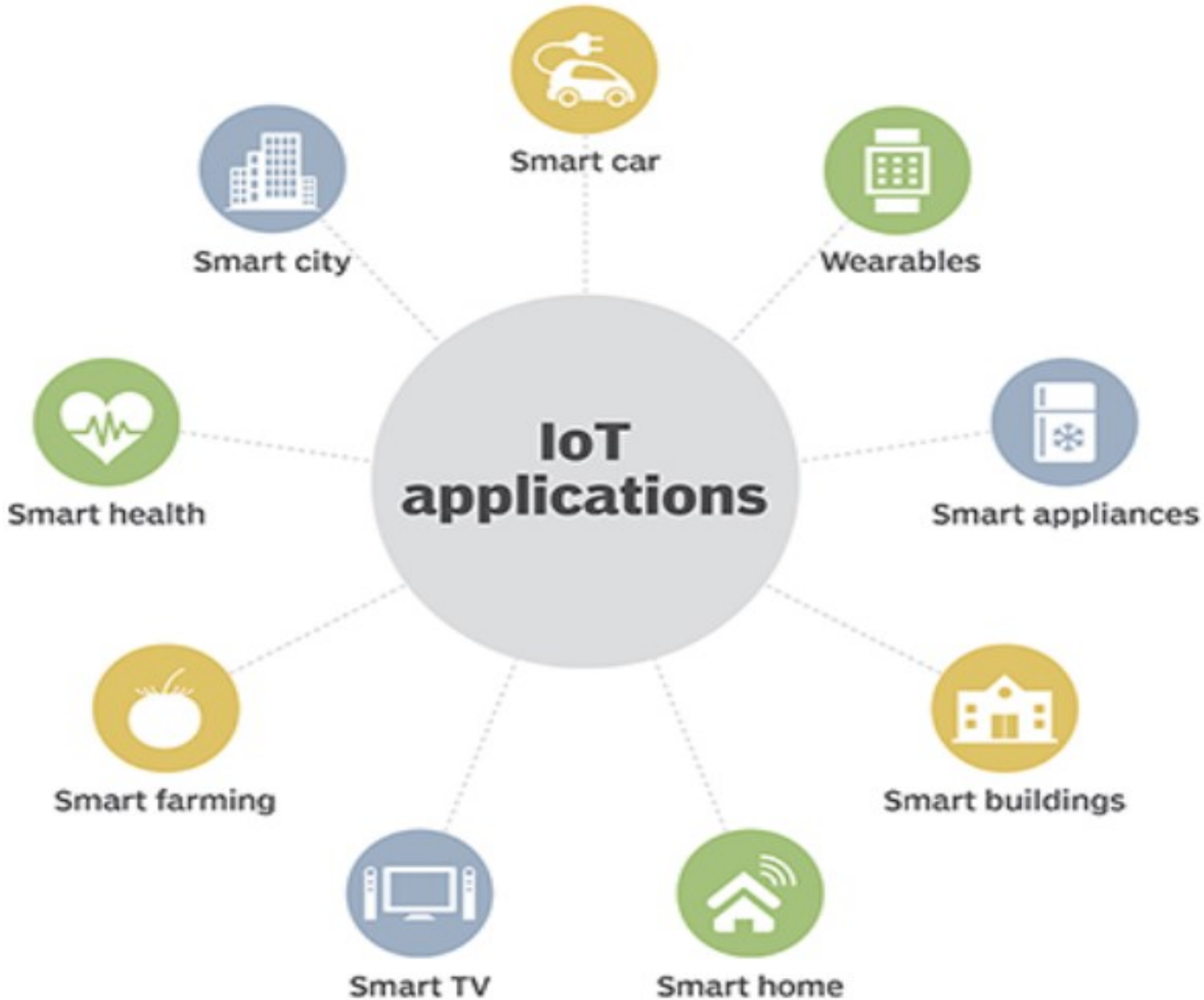


# Internet of Things (IoT)

# IoT – Internet of Things

In the Internet of Things, objects (smart objects) and equipment (Cyber Physical Systems) have their own intelligence and identity and organize themselves in an "intelligent" environment, interacting among themselves and with the human operator.




IoT applications
Smart car
Smart city
Wearables
Smart health
Smart appliances
Smart farming
Smart buildings
Smart TV
Smart home

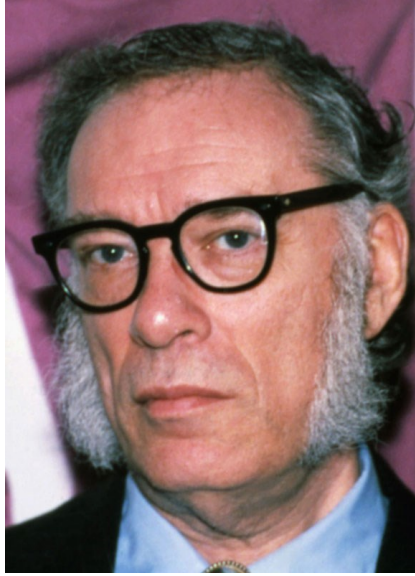
# Big Data and Analytics

# Big Data

Relatively more data, more processing capacity.

Increase in Volume, Variety, Speed, Veracity (Truth) and Value of available data.

The current data analysis of today's data is no longer sufficient to make better decisions.



*“All collected data had come to a final end. Nothing was left to be collected. But all collected data had yet to be completely correlated and put together in all possible relationships.”*

The Last Question by Isaac Asimov © 1956

# A New ‘Analitycs’ with the Big Data.

All the potential value of Big Data lies in the Analysis that can be applied to it:

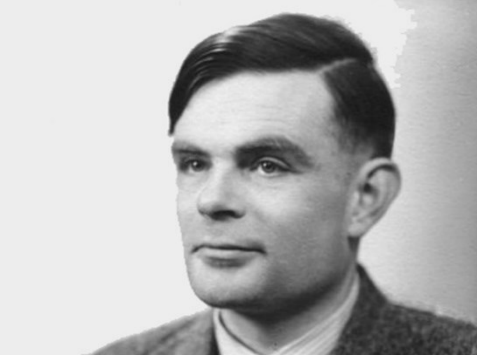
- Descriptive, Describe the state of things
- Predictive Predict their evolution
- Prescriptive Suggest the actions to take in the face of alternative evolutions of situation, so that to draw the greatest benefits

# Artificial Intelligence

# Artificial intelligence

The discipline which studies the theoretical foundations, methodologies, and techniques that allow to design digital systems and systems programs capable of providing processor performance that, to a common observer, it would seem to be the exclusive relevance of human intelligence

# Turing Test



For a **computer** to **pass the Turing Test**, a human must be unable to tell whether he or she is **having** a conversation with a **computer** or another human.

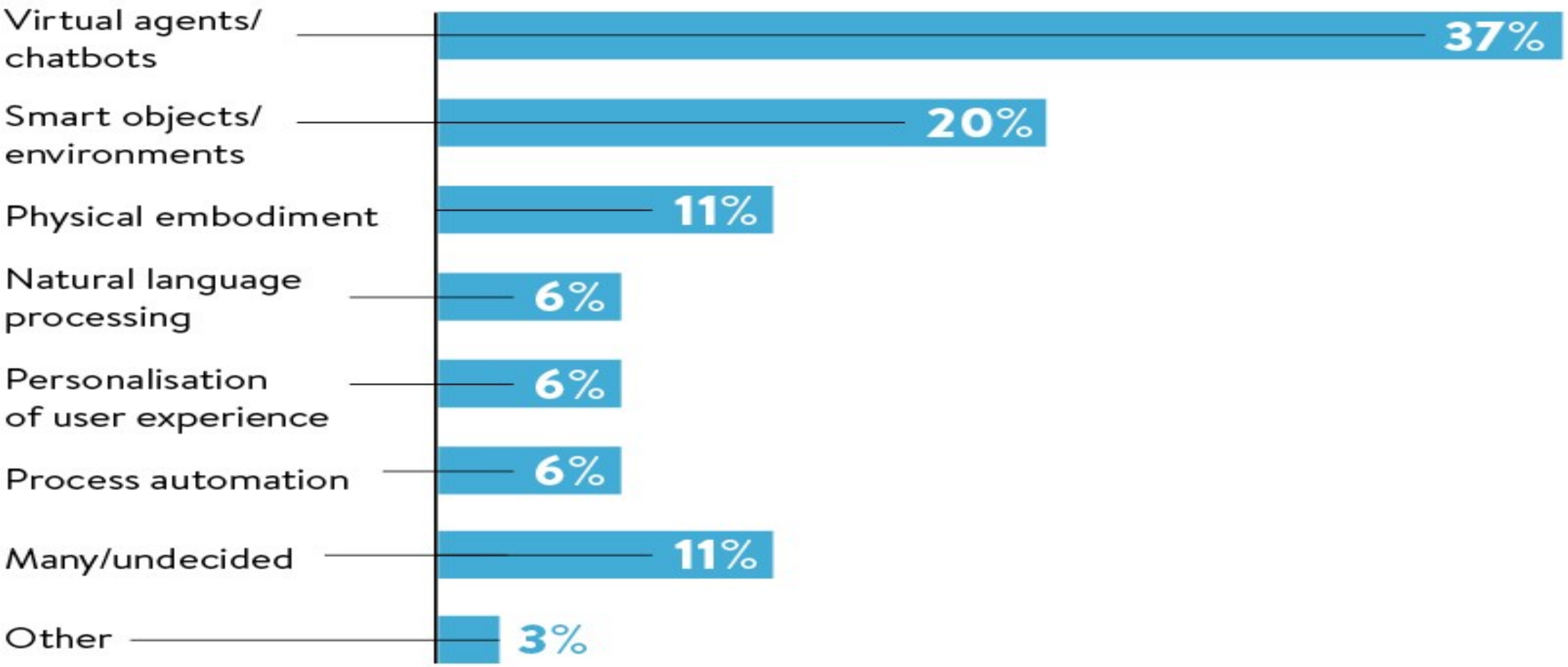
# Robotic Process Automation (RPA)

## RPA (Robotic Process Automation)

RPA is a nonphysical software robot performing process activities by replacing human intervention or activities with application.
They both leverage software tools to automate processes – promoting efficiencies, lowering costs, raising accuracy and elevating quality.


RFQs are sent to the preferred vendors and the market in one click
Data analyzed, decision made
Information consolidated **automatically**
Automated PO issued

# Applications of Artificial Intelligence



# Cognitive Procurement

# Cognitive Procurement

Cognitive procurement is a method of using disruptive technologies to aid in the management of the procurement function. It is the process of using self-learning technology to process data in order to aid in the process of acquiring or buying goods and services.

Procurement, being a very data-rich industry, is a prime candidate to reap the benefits of cognitive technologies:

- There are many data points around raw materials, goods and services, transportation and delivery, and suppliers.
- It is based in transactions

# Cognitive Procurement Technologies

- Artificial Intelligence in procurement
- AI chat-bots
  - Guided buying
  - Offer operational support
- Big Data Analytics in procurement
- AI products & challenges
- Cognitive Enterprise

# Use of AI in Procurement

## 1. Sourcing

Sourcing using AI, combined with machine learning, can transform sourcing events by helping with tasks such as defining the correct “request for proposal” type; identifying appropriate suppliers to participate based on commodity category, region, or industry; and delivering intelligence on market signals and pricing pressures to optimize results.

## 2. Contract and Vendor Management

Contracting can also become smarter and more comprehensive with applications that automatically identify relevant terms and conditions matched to legal library and taxonomy, uncover similar contract terms for a specific commodity by industry or region based on benchmarking data, and suggest optimal prices to target based on expected volume and contractual discounts.
When a supplier’s performance drifts out of alignment with the contract, the AI-based software can let you, and the supplier, know right away. No number crunching and no time-consuming surveys. AI can also be used to help make sure your organisation better manage supplier relationships ensuring that invoices are ready to be paid on time, based on their specific payment terms.

## 3. Order Processing

When the software knows who you are and what you are permitted to order, your requisition becomes an order and a fulfilled delivery with a single click. Only the most exceptional cases need the professional’s personal attention

## 4. Risk Management

Buyer can also integrate financial risk scores, sustainability and corporate social responsibility (CSR) scores and similar third-party data sources related to risk.
With this information, procurement can enrich a spend analysis process to see not just how much it spent with a supplier but also whether that spend is in jeopardy because the supplier is teetering toward bankruptcy, or could balloon because the supplier is based in a politically unstable geography, or is tied to an environmentally harmful production process.

# Alpha Case: A Large Italian Food Company (1/2)

These technologies can bring benefits, such as the possibility of reducing the number of employees of the procurement office of 41 full-time equivalents (FTE) out of 112, corresponding to 37% of the total.

The benefits can be analyzed based on the organization's point of view and that of the processes.

The organizational analysis can be divided into back-office, middle-office, and front-office benefits:

- The savings in the back office is up to 89%. This area is mainly formed by repetitive and standardized activities. They can be done using RPA.
- The front-office needs more creativity and interpersonal skills. It has savings equal to 7% of the Full-time Equivalents (FTE).
- The middle-office can get savings of 75%

# Alpha Case: A Large Italian Food Company (2/2)

The improvement in the processes can be divided into strategic, tactical, and transactional results.

- At the transactional level, the application is so significant as to generate savings of 12.2 FTE, equal to 90% of the current job content. This level includes all routine and repetitive activities. They are well suited to the adoption of analytics tools;
- At a tactical level, the savings are 15.7 FTE. They correspond to 36% of the total employment at this level;
- At a strategic level, there are saving of 13.1 FTE equal to 24% of the total workforce at this level.

# Cognitive Procurement Solutions

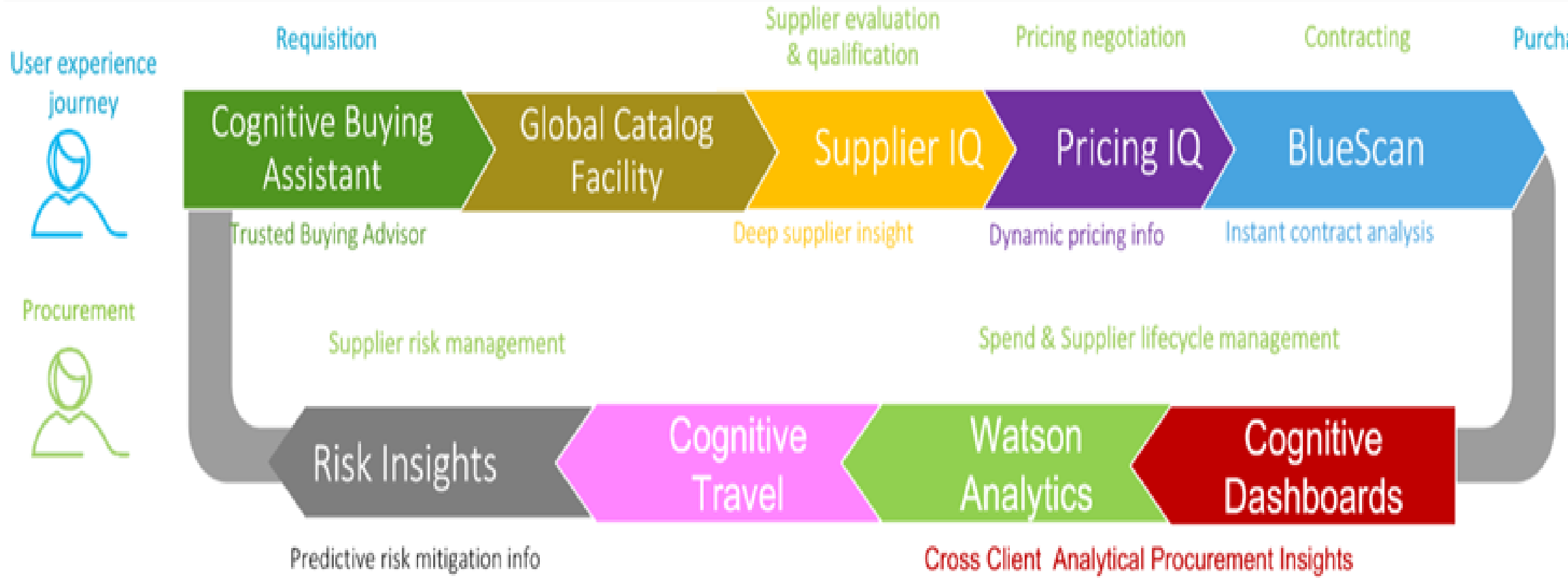
# SAP Ariba – Intelligent Procurement

| Use Case | Functionality |
| --- | --- |
| Invoice Creation, Reconciliation, and Approval | For suppliers: An invoice digital assistant combined with machine learning that can offer guidance during the invoice creation process, whether this involves a purchase order (PO) that is “flipped” using the PO-Flip feature or a non-PO invoice For buyers: A digital assistant that can recommend options to resolve exceptions or determine optimal queue management during invoice reconciliation |
| Productivity Mobile Apps | Conversational interfaces that enable users to interact with natural language and voice commands to access the status of key objects like POs, invoice status, or payments as well as approval workflows and other activities |
| Sourcing | Strategy assistance for sourcing managers with activities such as defining the ideal auction type, event duration, and number of suppliers based on region/commodity category. |
| Contract Negotiation | Help creating a comprehensive contract for the specific region or commodity based on company policy, processes, and preferences. |
| Category Management/ Demand Analysis | Assistance for category managers in activities such as understanding buying patterns, recognizing price variations, and identifying changing demands |
| Customer Support 2.0 | Self-service experience to help answer common questions regarding invoice creation, supplier registration, or fees |
| | |

# IBM Cognitive Solutions – Value Drivers

| IBM Cognitive Apps | Description and Value |
|---|---|
| Cognitive Buying Assistant | Cognitive Buying App — interfaces with SAP Ariba & marketplace content, understands natural language and image input and provides insightful& personalised buying experience |
| Instant Contract Analyser | Facilitate efficient contract authoring for assembled and unassembled contract documents through instant analyses and comparison against approved template agreements, clause library and reference contracts. |
| Supplier IQ | Supplier financial and risk assessment tool using real time holistic view of all information to uncover hidden trends, drive insightful supplier management and risk mitigation. |
| Pricing IQ | Collect and refine real time comprehensive market intelligence data to identify pricing trends by category or skill and recommend optimized price points enabling improved supplier negotiations |
| Watson Analytics | Cognitive analytics tool, analysing structured and unstructured data from multiple sources to provide intuitive visualisation, driving greater visibility on spend and agility to make informed decisions |
| Predictive Risk | Cognitive event monitoring application to monitor natural, social, and economic supply chain disruptions, providing hyper localized insights, to make fast informed decisions in the most critical situations. |

# IBM Procurement Cognitive Solutions Journey Map




**User Experience**

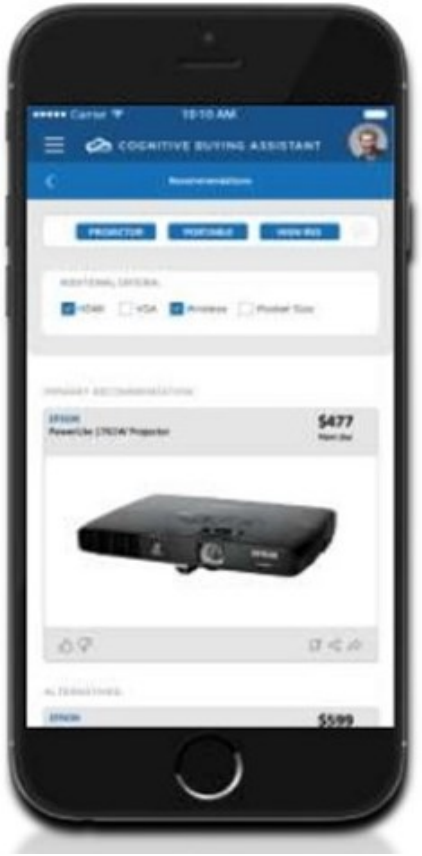
- ✓ **Simple easy engagements completed with speed**
- ✓ **Ability to use natural language, unstructured text & digital imagery.**
- ✓ **Highly personalized experience that learns over time**

**Procurement Experience**

- ✓ Refined real time data to make quicker more informed decisions
- ✓ Maximizes preferred suppliers
- ✓ Tactical and administrative tasks automated to allow a focus on strategic and relationship management activities

# Cognitive Buying Assistant

- Personalized mobile app that scales across multiple buying channels and systems
- Recommends the optimum compliant product while being transparent to the end-user
- Delivers recommendations from preferred vendor catalogues based on users needs, Profile-of-one and peer feedback
- Enables users to interact in Natural language for optimized user experience and speed

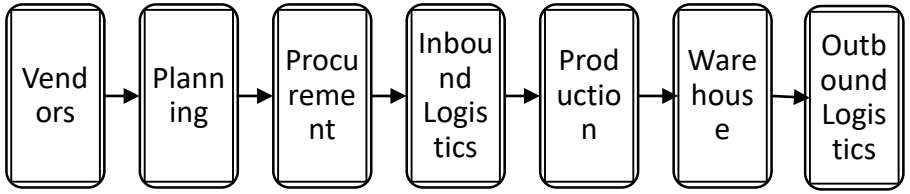


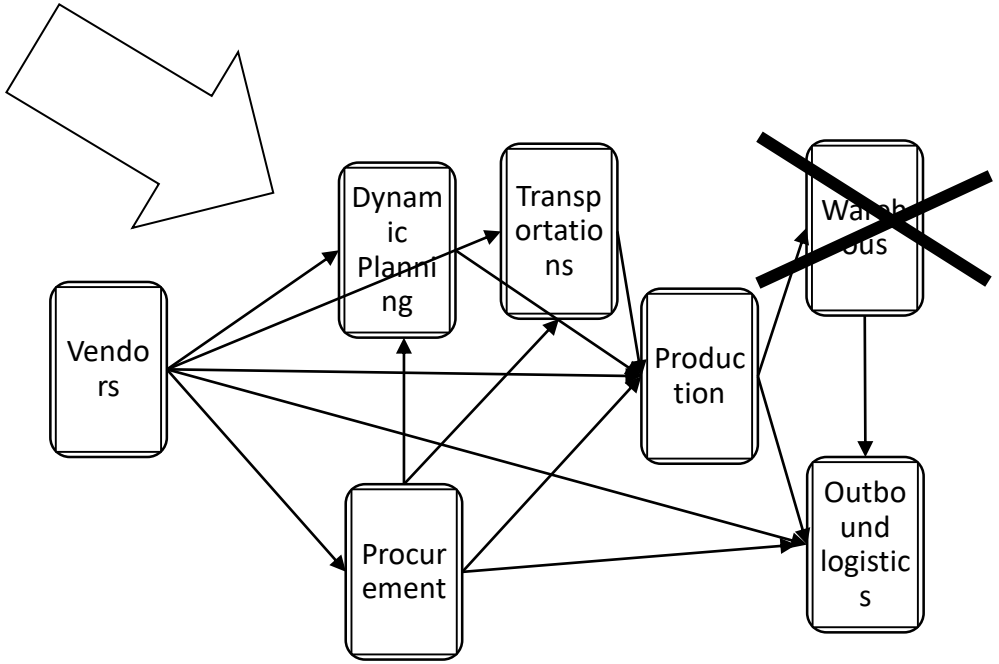
# Future Cognitive Procurement

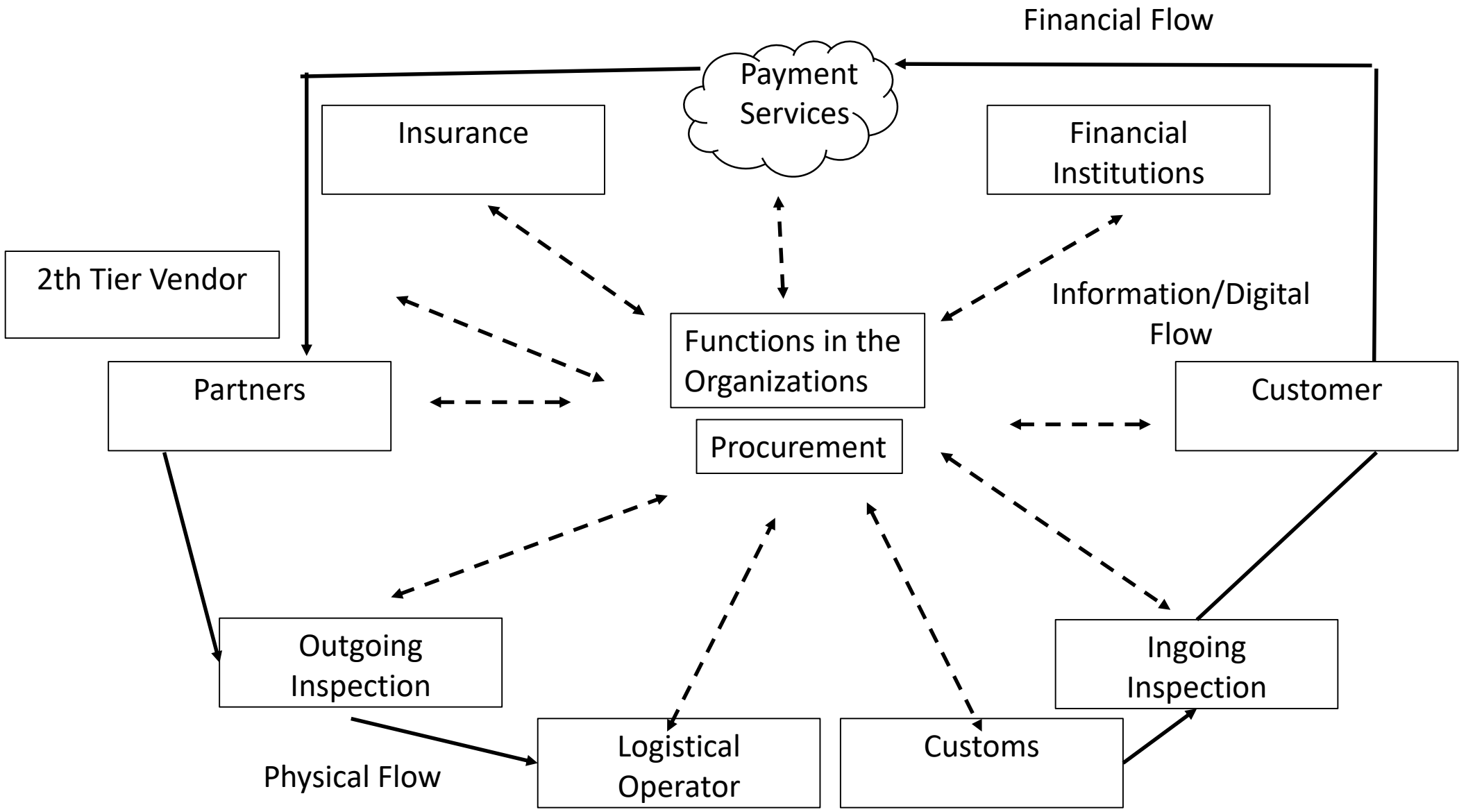
# Future Cognitive Procurement

- Future Procurement Organization
  - Digital driven and strategically focused procurement organization
  - Future procurement organization team
- Future Procurement Technologies
  - Cloud Computing
  - Industrial Internet of Things
  - Analytics
  - Cognitive Computing

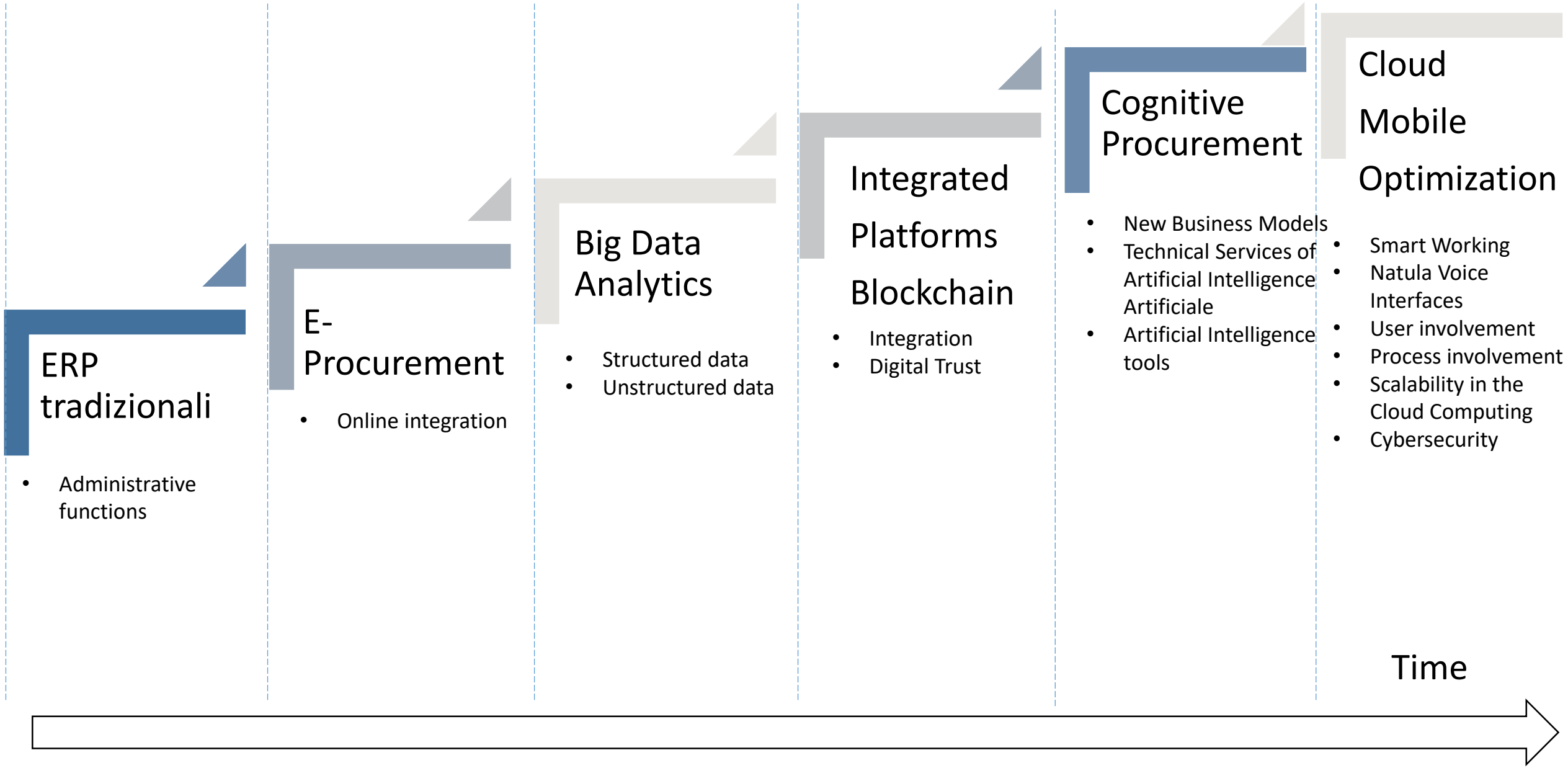
# From Supply Chain to Value Network




Financial Flow
Payment Services
Insurance
Financial Institutions
2th Tier Vendor
Information/Digital Flow
Functions in the Organizations
Partners
Customer
Procurement
Outgoing Inspection
Ingoing Inspection
Logistical Operator
Customs
Physical Flow

# Procurement Digital Transformation



# Security is Everyone's Problem

Identity theft is the fastest growing crime in America.

Source: Trans Union Website, January 14, 2015

Someone's identity is stolen every 2-3 seconds.

Source: https://identity.utexas.edu/id-perspectives/top-10-myths-about-identity-theft

The average loss per identity theft incident is $4,930.

Source: U.S. Department of Justice, Javelin Strategy & Research


On average it takes 600 hours to recover from identity theft.

Source: The Identity Theft Resource Center website, April 28, 2015

# It’s Not a Matter of If, but When…

13.1 million people experienced identity theft in 2015.

Source: Javelin 2016 Identity Fraud Study

63% of confirmed data breaches involved weak, default, or stolen passwords.

Source: Verizon 2016 Data Breach Investigations Report

Over 95% of all security incidents investigated recognized ‘human error’ as a contributing factor.

Source: IBM Security Services 2014 Cyber Security Intelligence Index

# Common Cyber Threats

1. Email Account Takeover
2. Malware
3. Phishing
4. Credential Replay
5. Social Engineering
6. Call Forwarding
7. Spoofing

*“There is nothing more difficult than introducing new orders because you have enemies who are damaged by that change and have warm supporters in those who can benefit from that change”*

**Machiavelli, Il Principe**

# Resume

- Teacher and consultant
- Laurea Ingegneria Politecnico di Torino. MESS at the Carnegie Mellon University, Pittsburgh, PA, USA.
- Experience in manufacturing, service, information systems and financial services
- Teaching experience in Management Science and Procurement
- Worked in 10 countries
- Master Black Belt in GE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