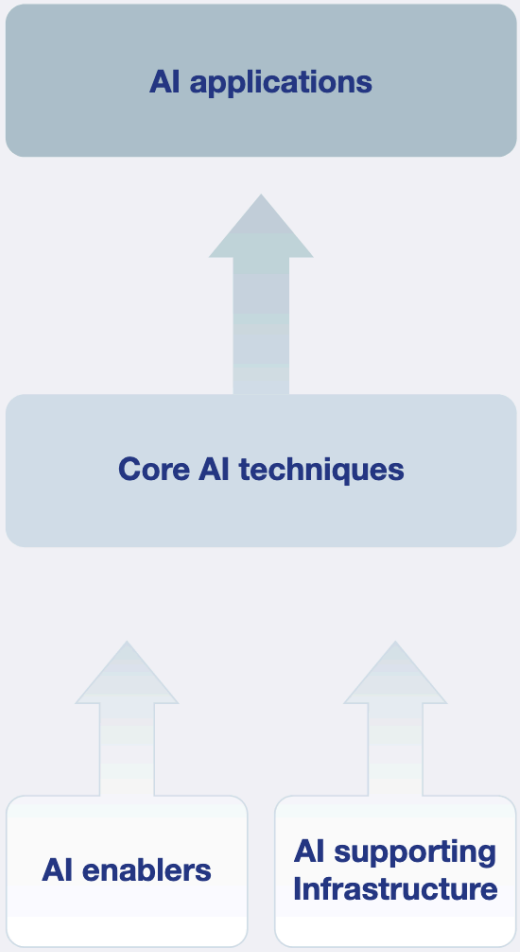
Figure 1.2. AI functional applications



AI applications

- Augmented research (marketing, medicine, science, etc.)
- Autonomous vehicles and drones
- Biometric, facial and gesture recognition
- Extended reality
- Generative product design
- Intelligent agents
- Predictive systems (maintenance, retail, trading, etc.)
- Recommendation systems
- Robotic process automation
- Test, speech, image and video recognition

Core AI techniques

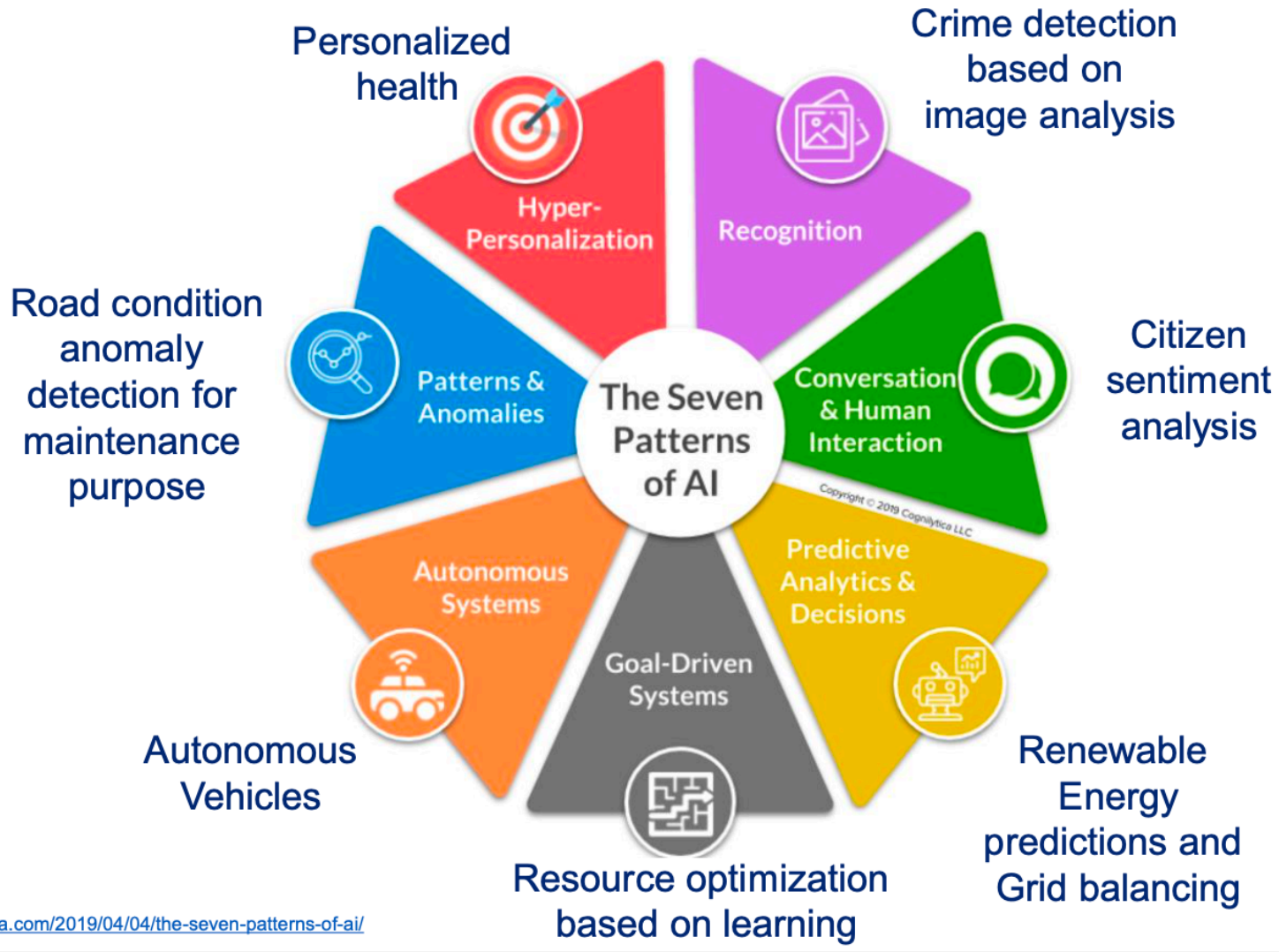
- Machine learning
  - Deep learning
  - Neural networks
  - Reinforcement learning
  - Supervised learning
  - Unsupervised learning
- Embodiment
  - Autonomous robotics
  - Human augmentation
- Rules-based reasoning
  - Decision making
  - Expert systems
  - Knowledge representation
  - Planning and scheduling
  - Search and optimization
- Perception
  - Augmented and virtual reality
  - Machine vision
  - Natural language processing

AI enablers

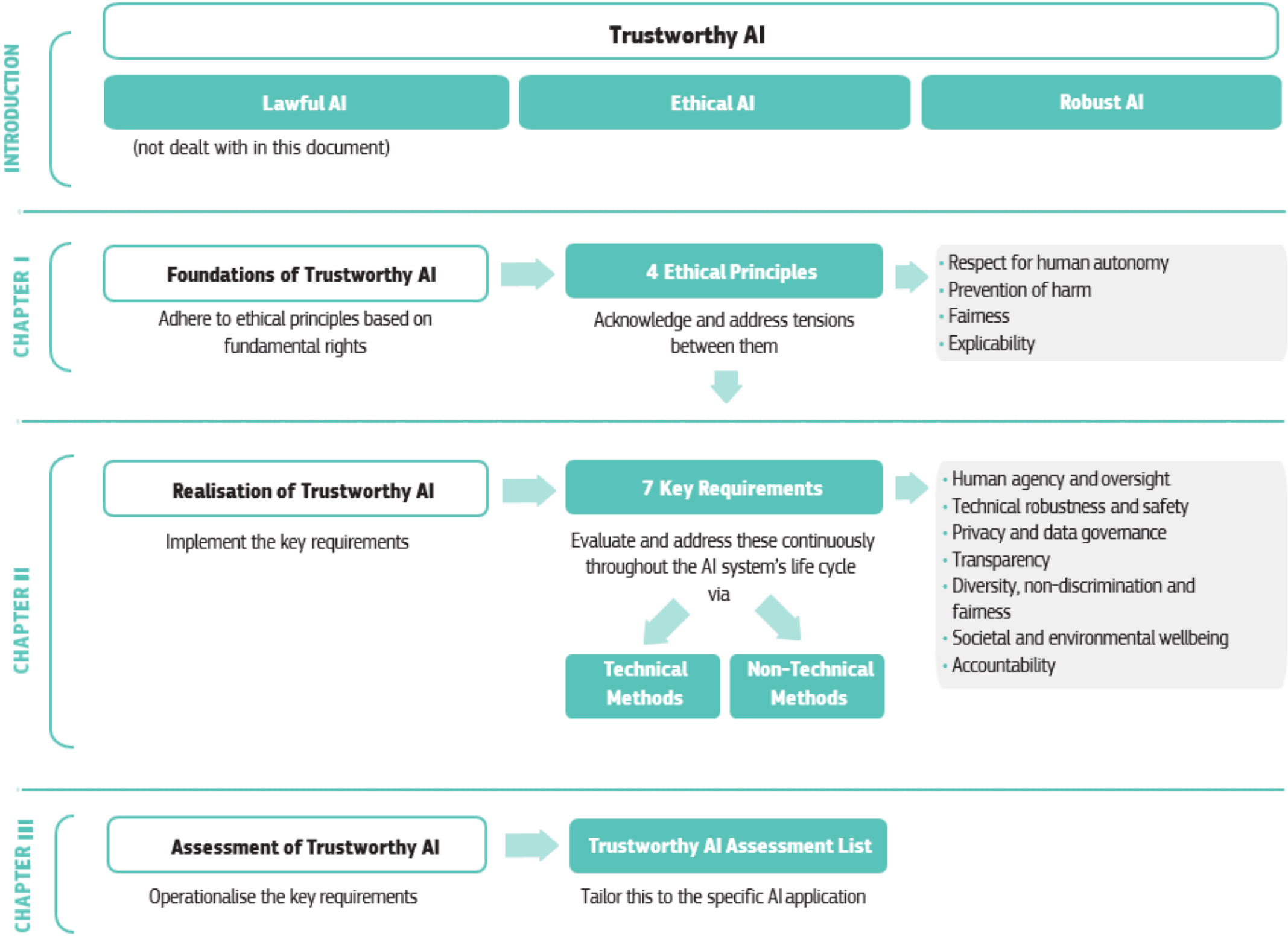
- Cybersecurity
- Data analytics
- Ethics and responsibility
- Structured and unstructured data

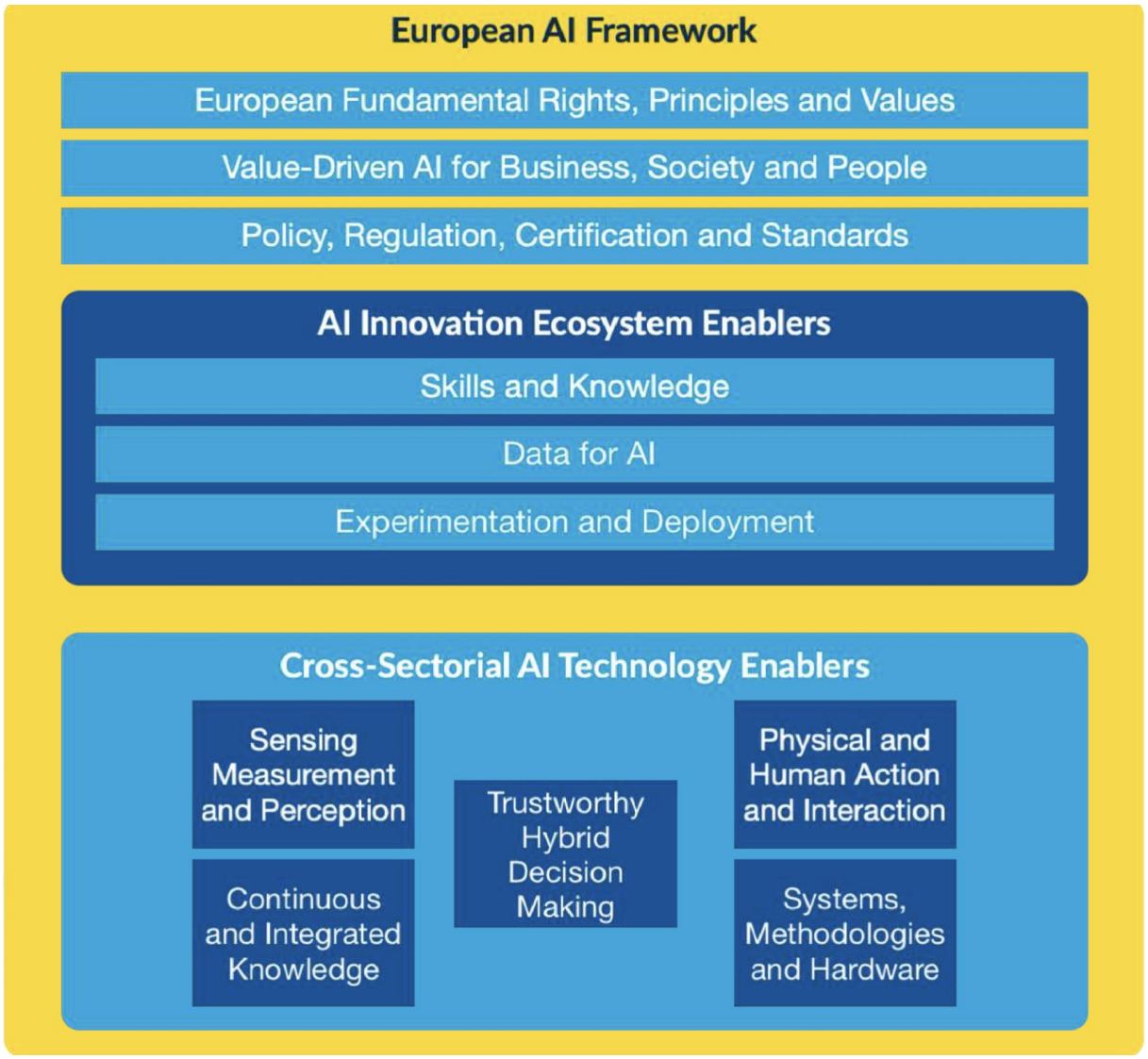
AI supporting Infrastructure

- Cloud
- High speed Internet and processors
- Sensors; Internet of things
- Mobile phones and devices
- Robotics



Source:https://www.cognilytica.com/2019/04/04/the-seven-patterns-of-ai/


INTRODUCTION
Trustworthy AI
Lawful AI
Ethical AI
Robust AI
(not dealt with in this document)
CHAPTER I
Foundations of Trustworthy AI
Adhere to ethical principles based on fundamental rights
4 Ethical Principles
Acknowledge and address tensions between them
Respect for human autonomy
Prevention of harm
Fairness
Explicability
CHAPTER II
Realisation of Trustworthy AI
Implement the key requirements
7 Key Requirements
Evaluate and address these continuously throughout the AI system's life cycle via
Technical Methods
Non-Technical Methods
Human agency and oversight
Technical robustness and safety
Privacy and data governance
Transparency
Diversity, non-discrimination and fairness
Societal and environmental wellbeing
Accountability
CHAPTER III
Assessment of Trustworthy AI
Operationalise the key requirements
Trustworthy AI Assessment List
Tailor this to the specific AI application


European AI Framework
European Fundamental Rights, Principles and Values
Value-Driven AI for Business, Society and People
Policy, Regulation, Certification and Standards
AI Innovation Ecosystem Enablers
Skills and Knowledge
Data for AI
Experimentation and Deployment
Cross-Sectorial AI Technology Enablers
Sensing Measurement and Perception
Continuous and Integrated Knowledge
Trustworthy Hybrid Decision Making
Physical and Human Action and Interaction
Systems, Methodologies and Hardware

Systèmes avec modèle de données différent

Requêtes complexes, modèle de données non relationnel

Type	Organisation	Requêtes	Exemples de systèmes
XML	Données arborescentes, hiérarchiques	XQuery	BaseX, eXistdb
Objet	Données complexes, avec propriétés et méthodes	OQL, VQL	VERSANT
Graphe	Graphe avec nœuds, arêtes, propriétés	Cypher, Gremlin	Neo4j the graph database
Triplets	Triplets RDF du Web sémantique	SPARQL	

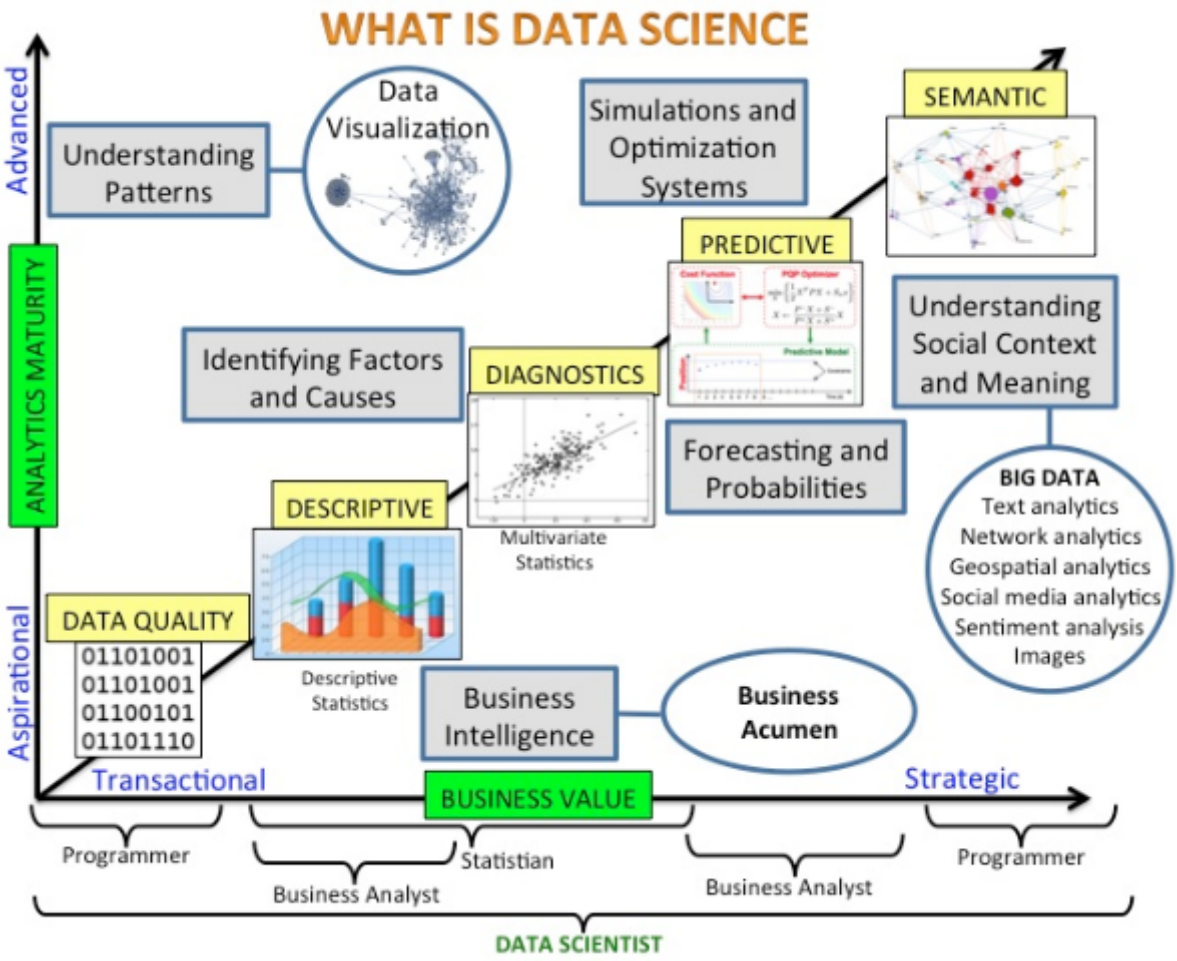

WHAT IS DATA SCIENCE
Advanced
ANALYTICS MATURITY
Aspirational
Understanding Patterns
Data Visualization
Simulations and Optimization Systems
SEMANTIC
PREDICTIVE
Understanding Social Context and Meaning
Identifying Factors and Causes
DIAGNOSTICS
Forecasting and Probabilities
BIG DATA
Text analytics
Network analytics
Geospatial analytics
Social media analytics
Sentiment analysis
Images
DESCRIPTIVE
Multivariate Statistics
DATA QUALITY
01101001
01101001
01100101
01101110
Descriptive Statistics
Business Intelligence
Business Acumen
Transactional
BUSINESS VALUE
Strategic
Programmer
Statistian
Business Analyst
Business Analyst
Programmer
DATA SCIENTIST

Figure 4. Areas of the AI system in which biases can appear