



REGIONE
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Hansel

LE NUOVE TECNOLOGIE PER IL PHARMA 4.0: COME AI, IOT, BLOCKCHAIN POSSONO AIUTARE LE AZIENDE AD INNOVARE PROCESSI E PRODOTTI

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New forces are challenging the future of Life Science company competitiveness

It is time for a paradigm shift



New **regulatory requirements** (Serialization, IDMP, EU GDP)



Structured and unstructured **data explosion** (RWD, Pharma IoT/I4.0)



New **business models** (shift toward high value but lower volume products)



Shift from Quality by Inspection to **Quality by Design**



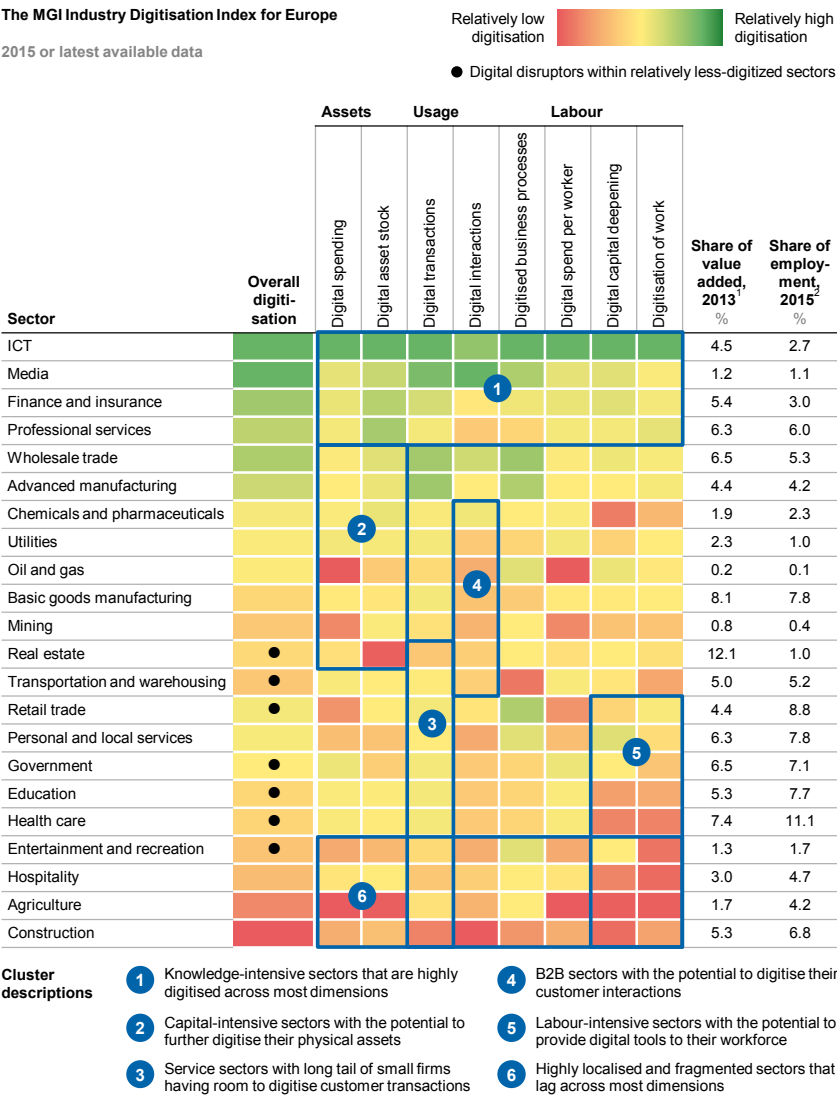
New **supply chain** requirements (flexibility, responsiveness, transparency)



Holistic **Lifecycle** Management (knowledge, products & processes)



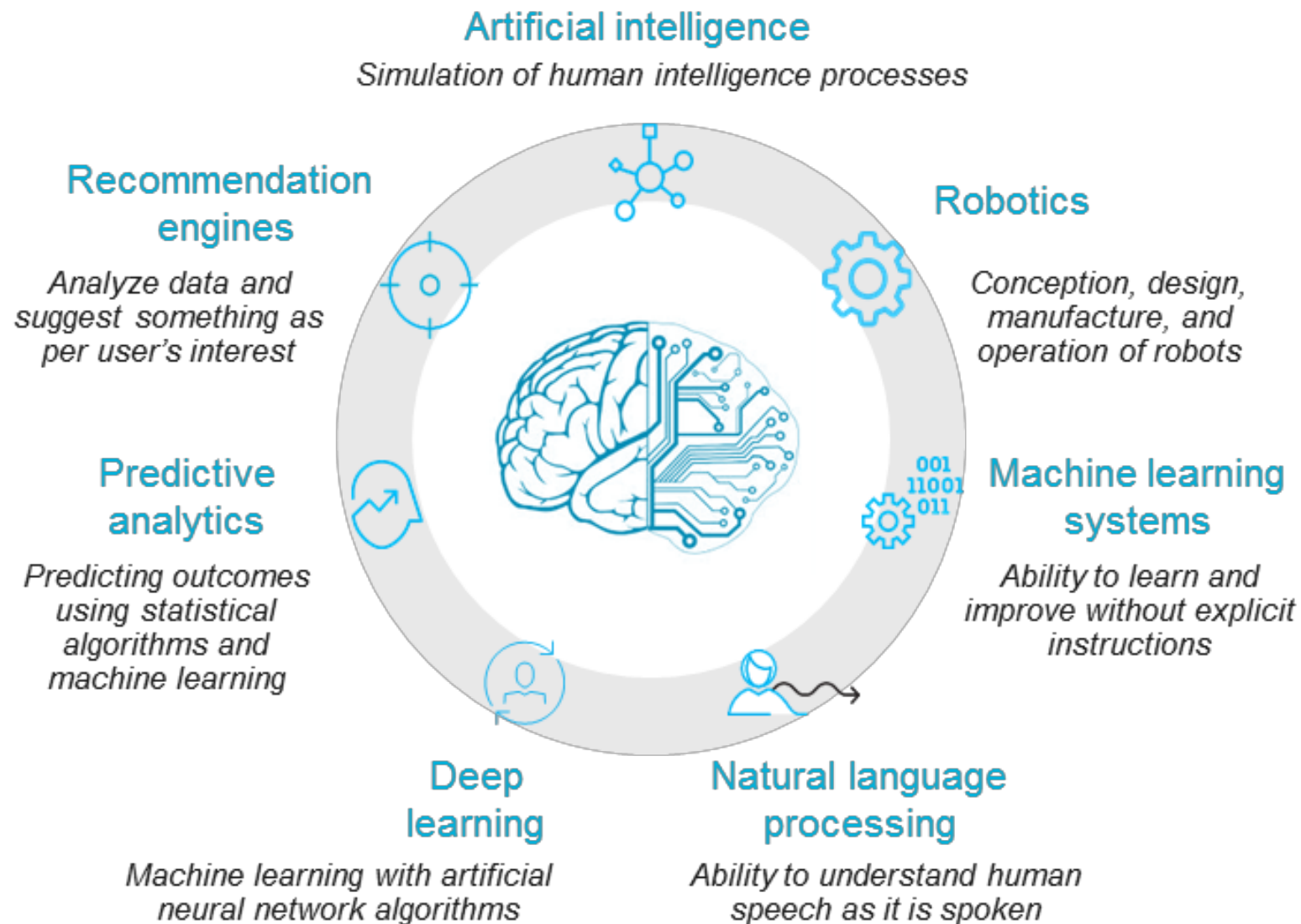
New **ecosystem** and value network requirements



1 Value added as proxy for GDP; 15 countries used as proxy by EU-28.
2 EU-28.
NOTE: The level of sector digitisation measures digital assets, usage, and labour by sector. It does not refer to the intensity of digital competitive threat in a sector.

SOURCE: EU Klems; Eurostat; OECD; McKinsey Global Institute analysis

Digital technologies have become a source for creating new value in Life Sciences

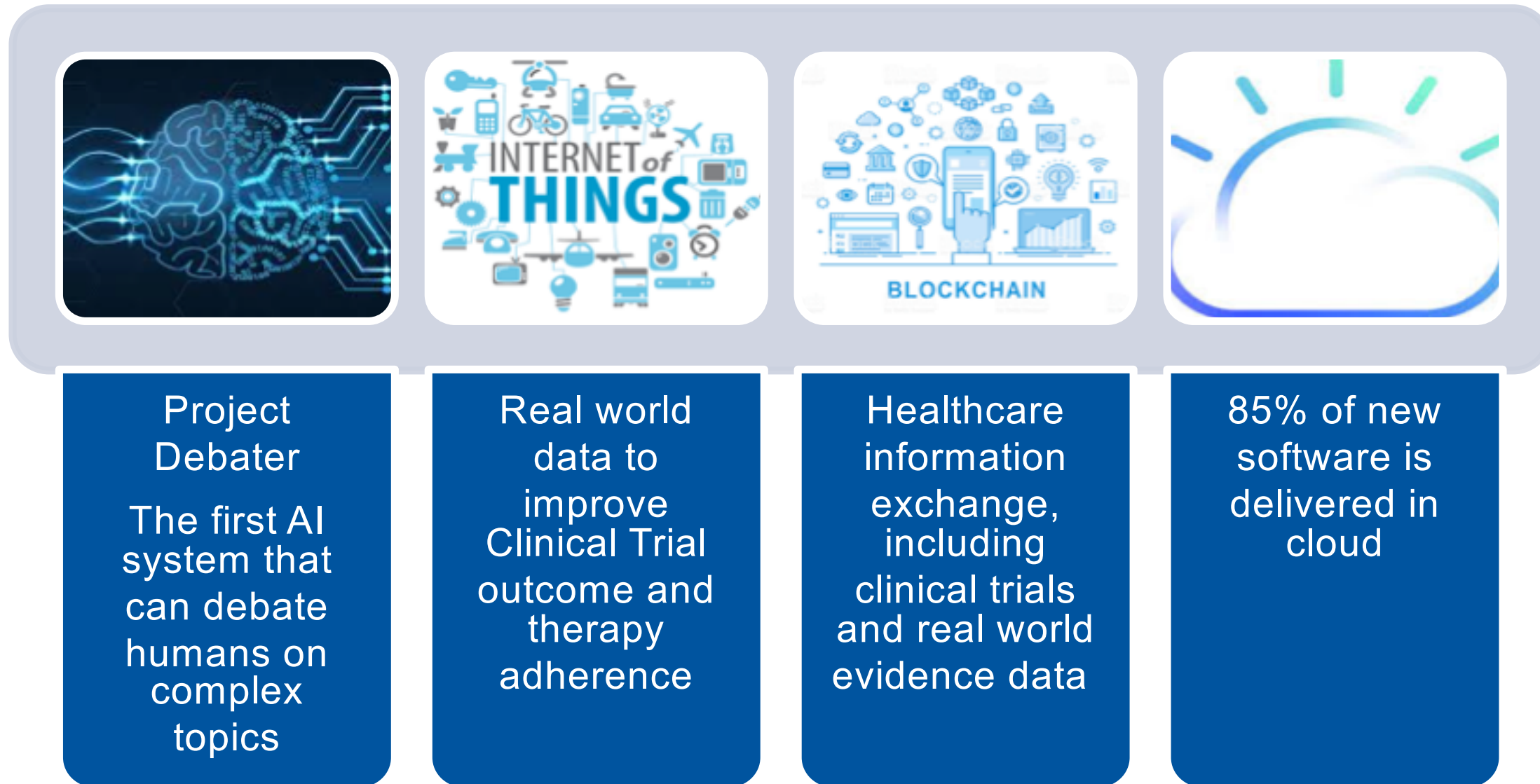


Business Value

New digital technologies can enable value for the whole ecosystem by:

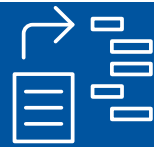
- > Generating **new insights** from knowledge and data
- > Increasing **efficiency and value** to stakeholders
- > Ensuring better **compliance and risk** management
- > Improving **customer engagement** and value to healthcare system
- > Enabling **new services and business models**

Innovation into Life Science companies can be accelerated by technology pillars that are transforming many industries

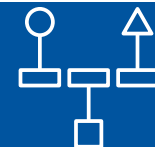


SOME CONCRETE EXAMPLES

IBM solutions are amplified by the power of Cognitive Computing



USES BUILDING BLOCKS



UNDERSTANDS



REASONS



LEARNS



INTERACTS



NEEDS DATA



Watson for Drug Discovery is helping Barrow Neurological Institute identify new genes potentially responsible for amyotrophic lateral sclerosis (ALS)

Watson for Drug Discovery (WDD) investigated whether:

- Unknown RNA binding proteins are involved in ALS
- Unknown prion-like proteins are linked to ALS



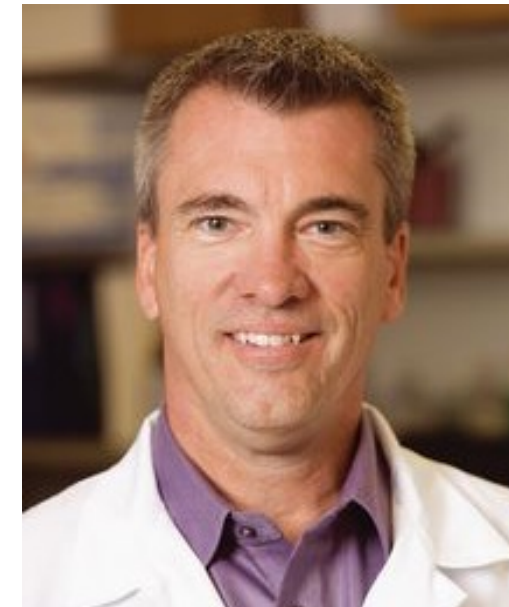
RAPID EXPLORATION: Within months, using predictive modeling, rank ordered 1,500 RNA binding proteins for their association to ALS



VALIDATED PREDICTIONS: Barrow examined Watson's top evidence-based predictions & found 8 of the top 10 ranked proteins were linked to the disease



NEW DISCOVERY: Uncovered 5 never before linked proteins altered in patients with ALS



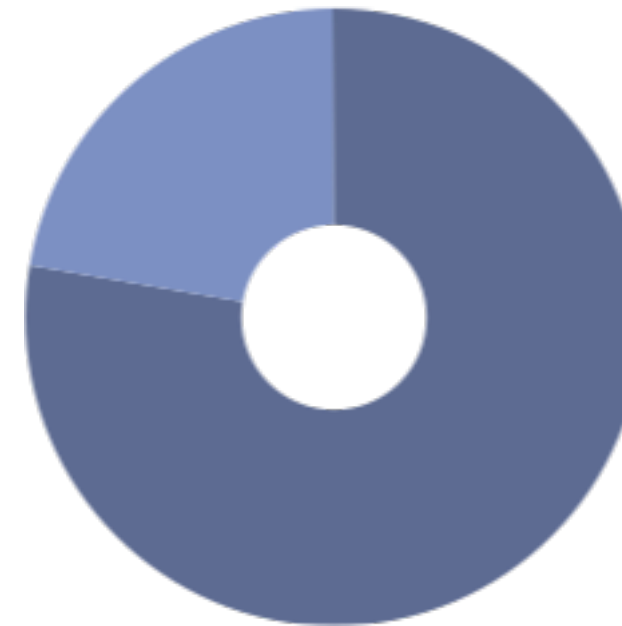
“By using Watson for Drug Discovery we can make scientific breakthroughs in a fraction of time and cost, increasing our knowledge of diseases faster than ever before.”



Cognitive technology optimizes screening and matching for clinical trials in a community cancer practice

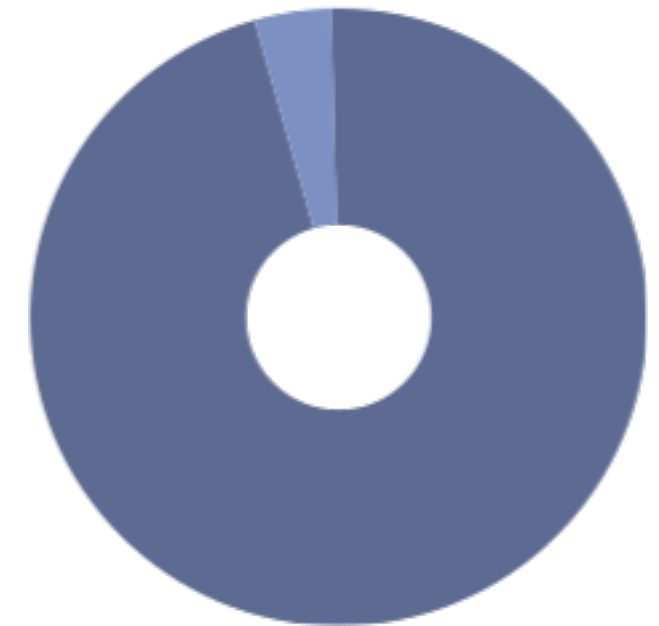
During a 16-week trial period, data from 2,620 visits by lung and breast care patients were processed in the **Clinical Trial Matching (CTM)** system

Watson for Clinical Trial Matching successfully demonstrated the ability to expedite patient screening for clinical trial eligibility, reducing processing time from 1 hour and 50 minutes to 24 minutes



78%

Reduced pre-screening
wait time

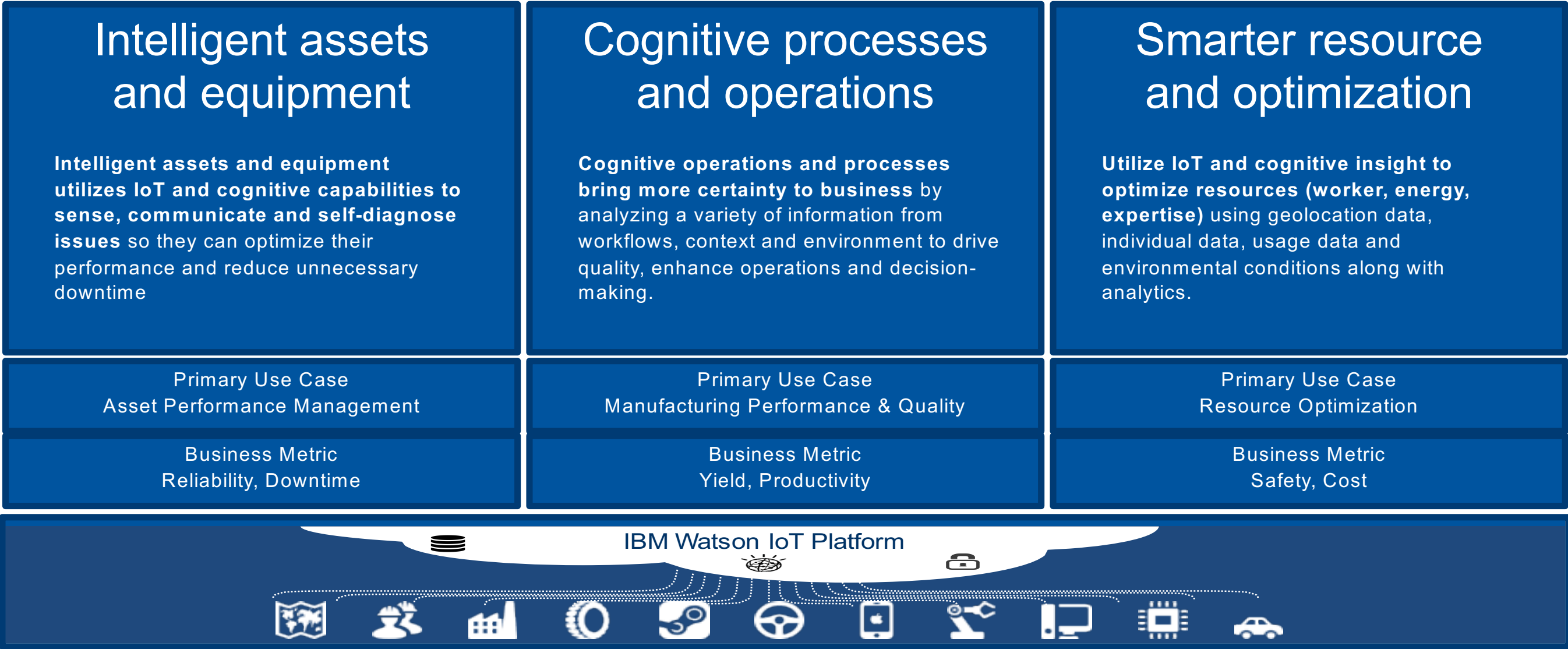


94%

Omitted 94% of non-matching
patients automatically

2017 ASCO Annual Meeting. Cognitive technology addressing optimal cancer clinical trial matching and protocol feasibility in a community cancer practice. DOI: 10.1200/JCO.2017.35.15_suppl.6501 Journal of Clinical Oncology 35, no. 15_suppl (May 2017) 6501-6501. Accessed at: http://ascopubs.org/doi/abs/10.1200/JCO.2017.35.15_suppl.6501#affiliationsContainer

IBM Watson IoT for Manufacturing drive cost savings and operational efficiency across the factory value chain



L'Oréal's Industry 4.0 program augments machines, operators and facilities

L'ORÉAL

The leading FMCG manufacture partners with IBM to implement a connected manufacturing platform in 40 sites globally

Business problem

The maintain world-class manufacturing status, L'Oreal needs to capture, analyze and derive insights from instrumentation and sensors in its production facilities

Lack of such insights was reducing overall operational excellence, productivity and throughput, as well as increasing labour and working capital costs

Solution

IBM will use Watson IoT for Manufacturing platform to build a predictive maintenance solution that enables visualization of production lines for detection of short term events, predictive Analytics on OEE and speed of machines and real time monitoring of operator health and safety



Blockchain enables trusted, secure business networks, across multiple partners with diverse solutions

Blockchain Benefits

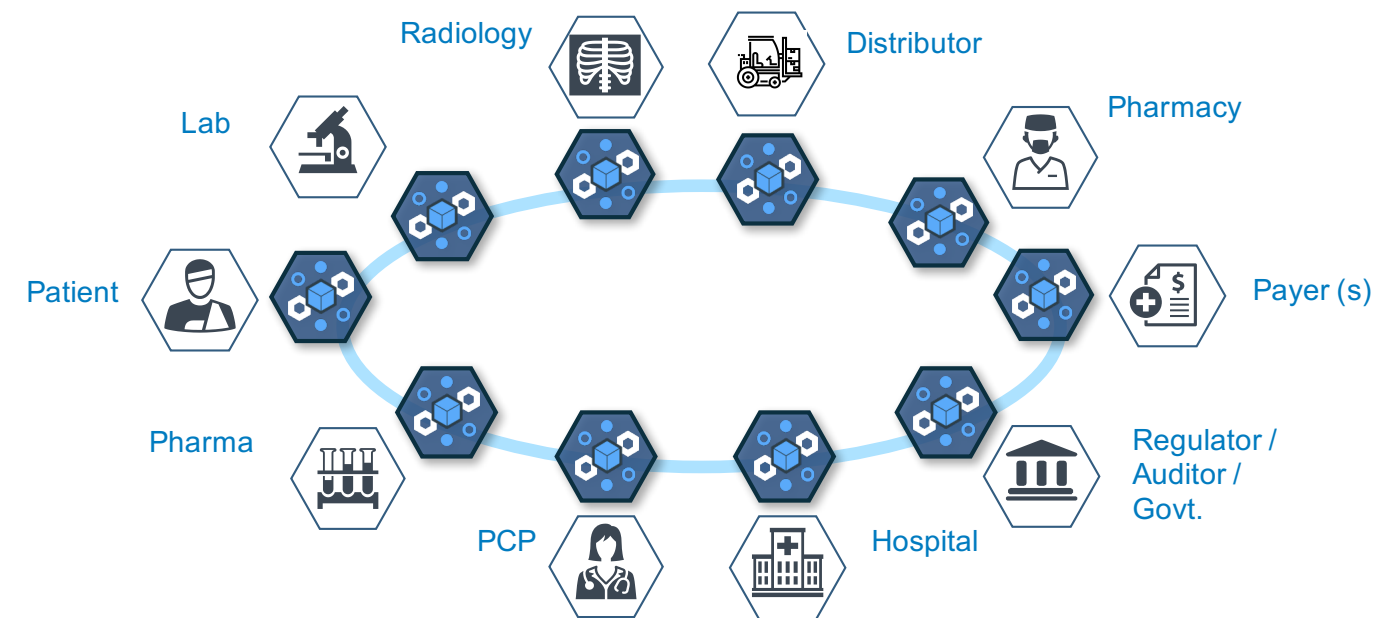
- > Provenance - All consent, data access and updates can be traced back to origin
- > Accountability – Immutable BC records keep parties accountable
- > Transparency - Regulators can monitor activities and detect abusive practices
- > Security - Unlike traditional systems, Blockchain security is a core design
- > Privacy - Only authorized parties can see health data they are permissioned to see

Shared Ledger

Append-only distributed system of record shared across business network. Single source of truth (and trust), and record depository of digital assets.

Smart Contracts

Business terms embedded in transaction database & executed with transactions, referred to as Chaincode.



Privacy & Security

Ensuring transactions are secure, authenticated & verifiable. Tamper proof, permission controlled, auditable identity and ownership.

Consensus

All parties agree to network verified transaction (modular protocol). Permissioned networks.

Example Blockchain use cases in Healthcare and Life Sciences



Patient Consent and Health Data Exchange

- > Patient control of his health data
- > Secure medical data exchange including EMR, genomics, image, exogenous
- > Blockchain ensures consent, compliance, auditability, provenance, governance



Clinical Trial Management

- > Clinical trials data exchange automation with auditability, provenance, traceability
- > Use blockchain for regulatory processes, oversight, fraud detection
- > Traceability of protocol design elements to data collection



Drug Supply Chain Provenance and traceability

- > Motivated by patient safety, counterfeit fraud, drug traceability, brand protection
- > FDA and EMA regulations, e.g. FDA DQSA



Outcome-based Care

- > Contract between Payer and Provider or Pharma for outcome based payment in BC
- > Contract, data and computation of outcomes in SmartContracts
- > Outcomes accessible by authorized participants
- > Blockchain provides trust among parties on outcomes with provenance and auditability



News room > News releases >

IBM Watson Health Announces Collaboration to Study the Use of Blockchain Technology for Secure Exchange of Healthcare Data

The joint initiative with the FDA is aimed at leveraging blockchain technology to improve public health.

Watson Platform for Health (GxP) represents one of the vertical implantation of IBM Cloud service for Life Science

Watson Platform for Health provides a foundational building block – essential to glean insights from big health data.

Watson Platform for Health enables Life Sciences companies to...



Develop applications that use the Health Data Platform

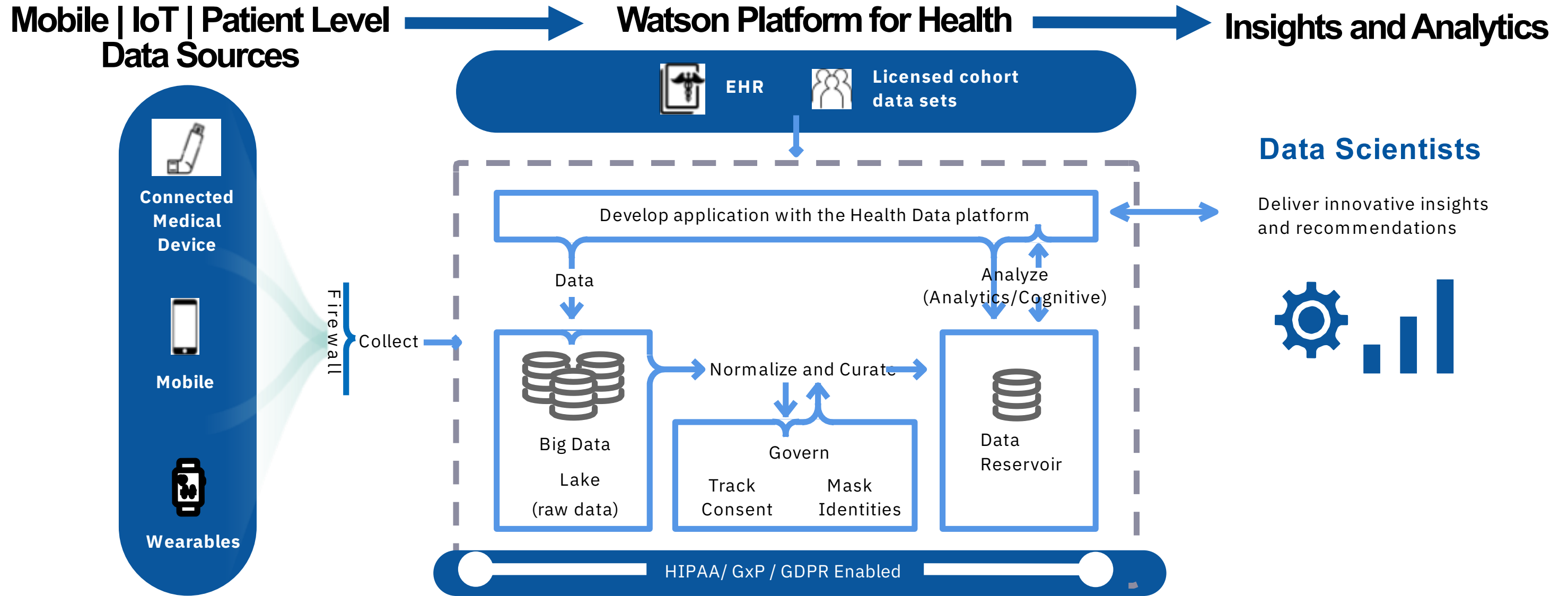
Collect health data from mobile applications or devices

Govern how data can be used by helping to mask identities and track usage consent

Normalize and Curate data into standardized models ready for analytics

Adhere more readily to industry security, privacy, and regulatory controls (HIPAA, GxP, GDPR)

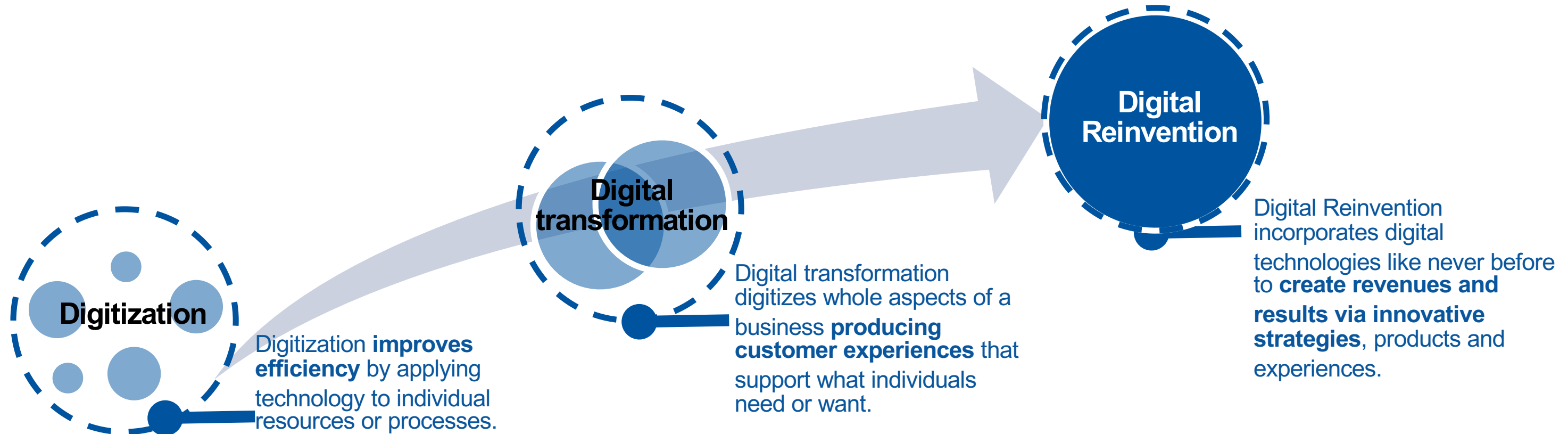
Watson Platform for Health enables companies to build innovative solutions using insights from big health data



Deploying AI + Cloud + IoT in the same solution can help Life Science companies to develop innovation and breakthrough services



To excel in this scenario Life Sciences firms need holistic reinvention based on the principles of Digital Reinvention



Digitization in LS organizations involves implementing technologies with the aim of making better decisions and establishing more efficient processes. For e.g. digitizing clinical test records and activities

Digital transformation in LS organizations involves leveraging digital technologies to transform legacy business models and business processes. For e.g. building analytics capabilities to deliver new services or insights

Digital Reinvention in LS mean reshaping the entire framework of an organization by placing positive health outcomes and customer experiences at the core of the firm. For e.g. attracting, engaging, and delighting consumers by building non-traditional capabilities embedded in new ecosystems based operating models



THANK YOU FOR YOUR
ATTENTION

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