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Energy and Water – The World We Live In

Industry Trends – Solution

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Agenda

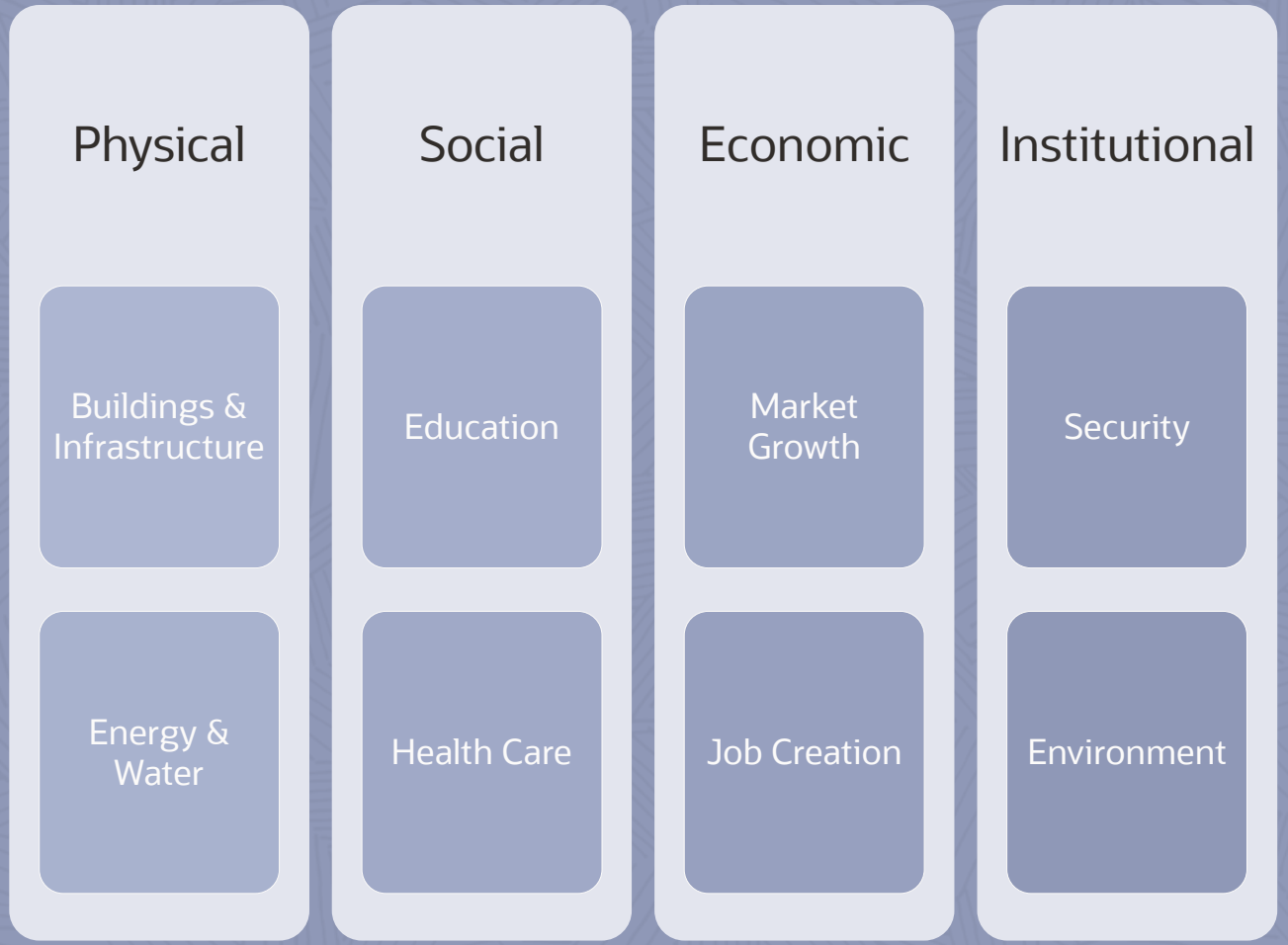
- **Trends**
  - Sustainable Smart Cities
  - Industry 4.0
- **Solution**
  - Comprehensive
  - Powerful

Sustainable Smart Cities and Industry 4.0

Sustainable Smart Cities

A sustainable smart city is an innovative city that uses Information and Communication Technologies to

- improve the quality of life
- efficiency of urban operations and services
- competitiveness



What Physical infrastructure is in Smart and Sustainable Cities

Transportation

Energy

Water Management

Waste Management

Green Space

Communication

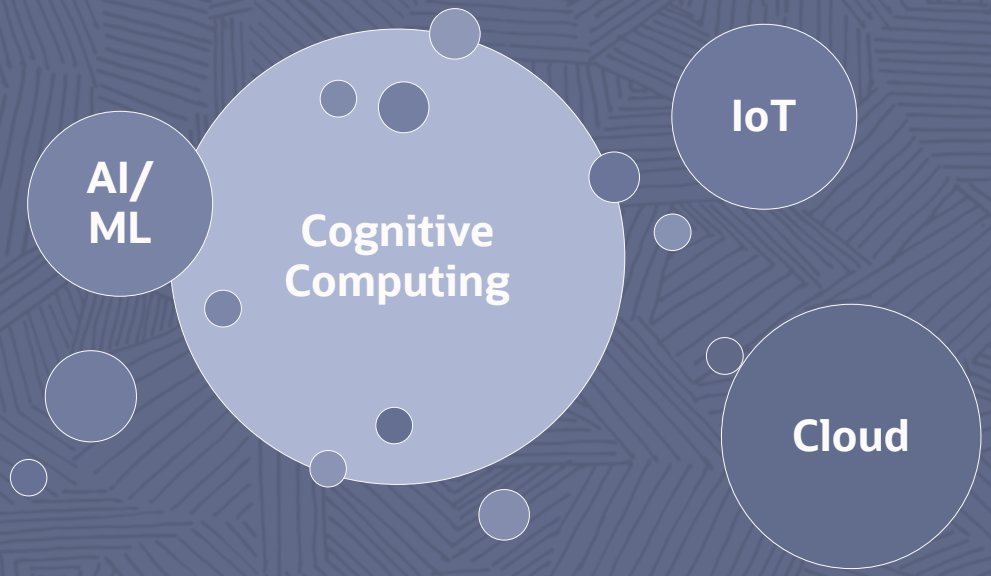
City Services

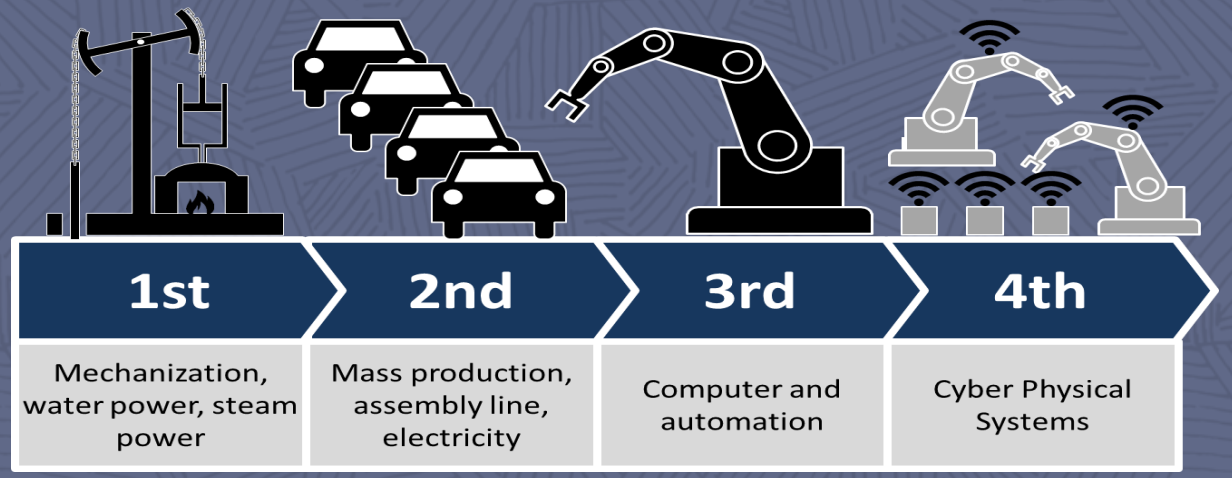
Buildings

Industry 4.0

Also known as the Fourth Industrial Revolution

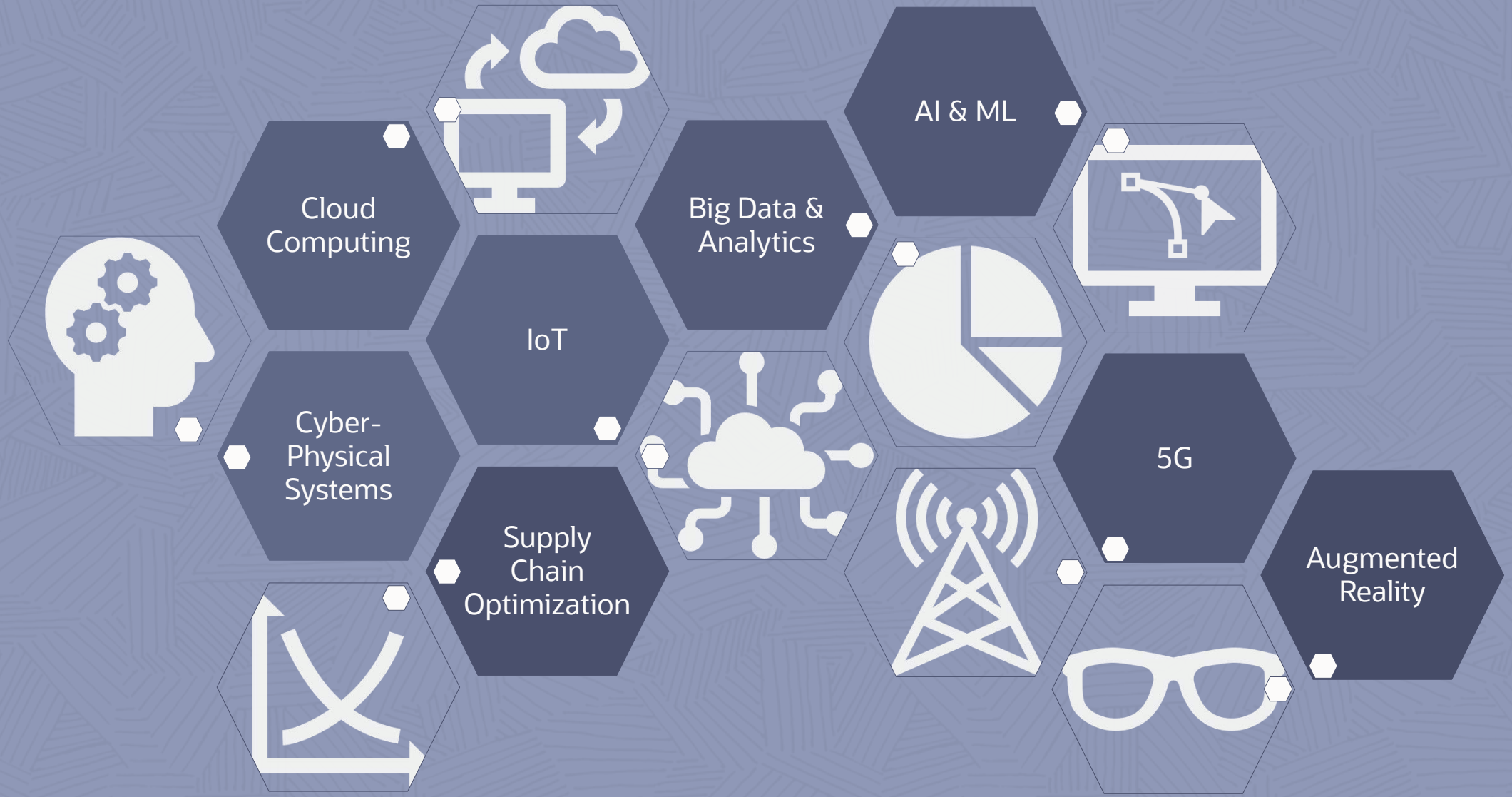
Cyber Physical Systems ?





- Tends to reference manufacturing
- Applicable across all asset-intensive industries
- Mirrors the human brain or helps human decision-making in an industrial setting.
- Includes speech recognition, natural language processing, object recognition, reasoning, human-computer interaction, and other technologies.

Industry 4.0 Approaches and Technology

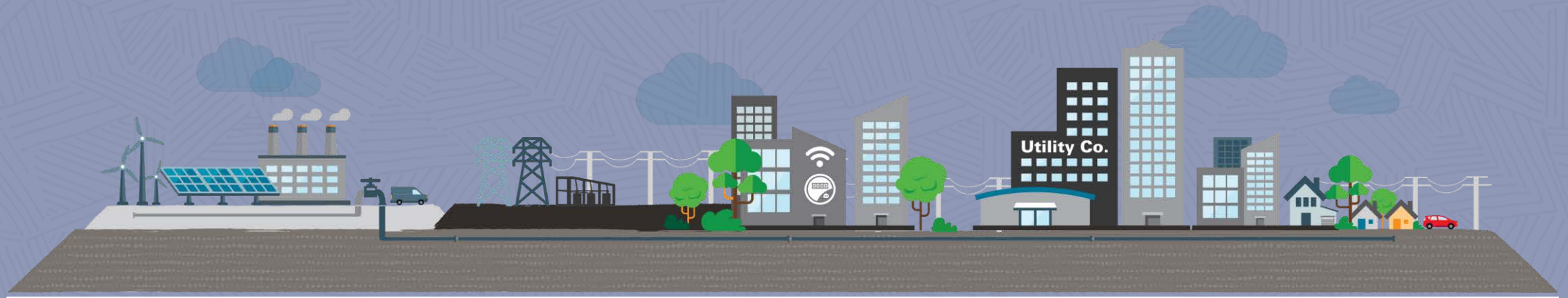


Intersection of S&S Cities and Industry 4.0 Technology

S&S Cities Area	IoT	Cloud	Analytics	AI/ML	AR/VR	5G
Buildings & Infrastructure						
Intelligent Transportation						
Energy Management						
Water Management						
Waste Management						
City Services & Emergency Mngt						

Our Solution

Modernized EAM Transformation – Requires complete and integrated solutions



Core Apps	ERP Finance	ERP Human Capital	Supply Chain	Customer Experience	Customer Operations	Asset Management	Work Management	Construction	Network Operations
Mobility	Mobile Work Management and Field Service Management								
Analytics	Business Intelligence, Visualizations, Data Analytics, and Governance								
Platform/infrastructure	Integration	Data Management	Security	App Dev	IT Ops Management	Content and Process	Compute	Storage	Networking

Oracle Integrated Cloud

Oracle Utilities Work and Asset Cloud Service **(WACS)**

Embedded Analytics and Pre-built Visualizations

Asset	**Work Management**	**Maintenance**	**Inventory**
Availability, Performance, Cost	Compliance & Construction, Preventative & Corrective	Resource, Planning, Labor Analysis	Stock Items, Transactions

What Physical infrastructure is in Smart and Sustainable Cities

Transportation

Buildings

Energy

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Green Space

Communication

Public Safety

How will this infrastructure be managed going forward?

WACS

- Physical asset and work management
- CWM for infrastructure projects

ERP Cloud

- Procurement
- Financials

OFS

- Optimized routing and dispatch for ALL work

DACS

- Focused specifically on digital asset requirements
- Registry, Config, Programs

DERMS

- Management of grid and behind-the-meter assets/devices

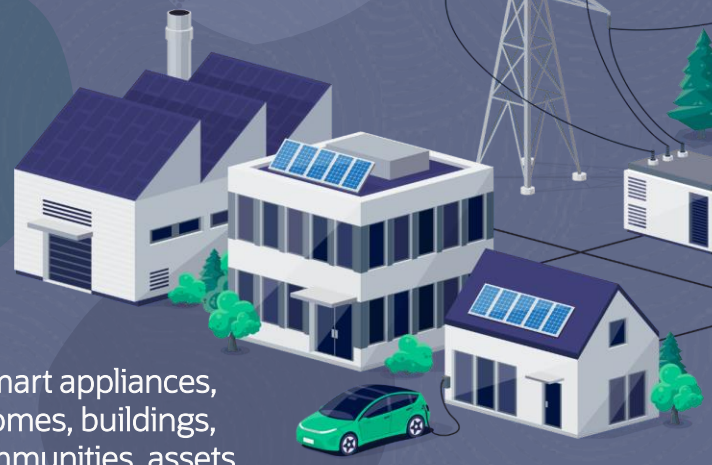
IoT

- Real-time communication for all of the smart city and digital assets

Analytics

- Insights across all of your business systems

The intersection of Smart Cities and Industry 4.0 overlays the rapid changes for Energy and Water



Rapid electrification of transportation: EVs commercial fleet and public transportation

Cyber security and regulatory changes

Advanced low-cost sensors, IoT & 5G

Distributed intelligence ML, AI, AR, and drones

Climate change, weather events, environmental standards, decarbonization

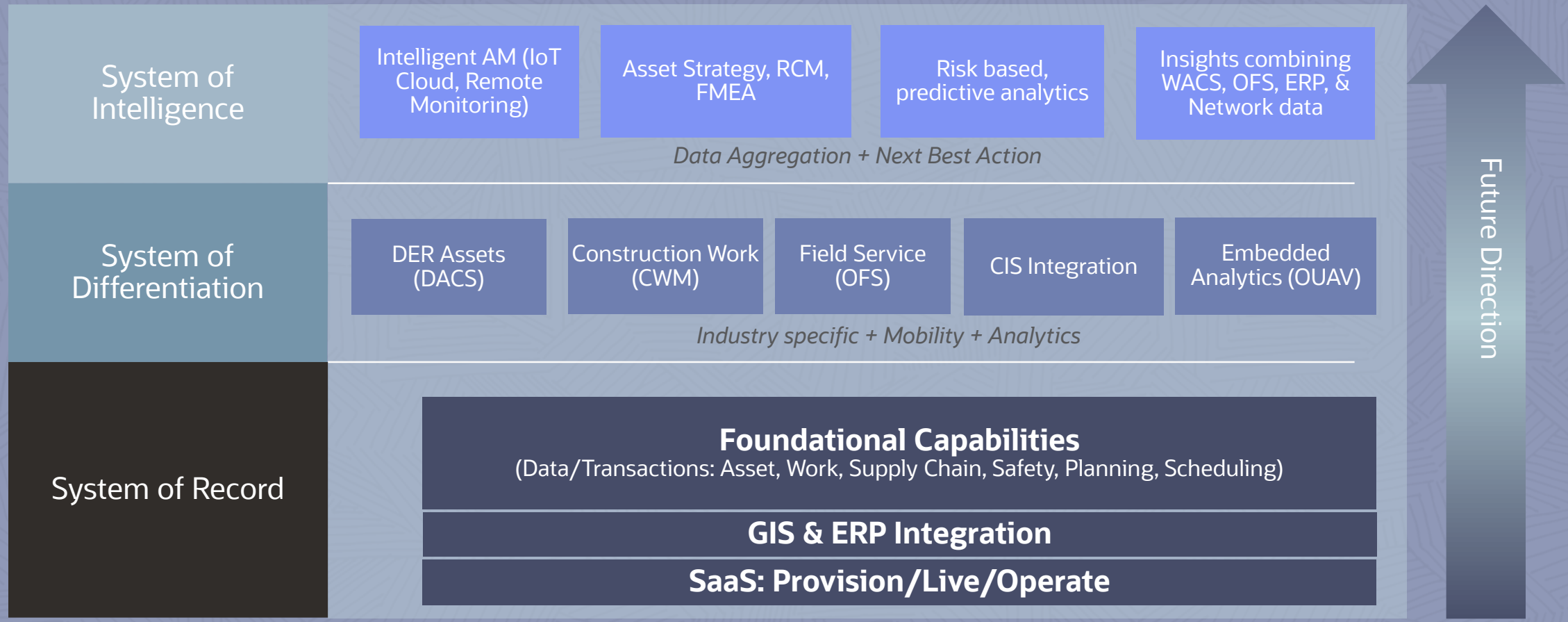
Renewables, DERs, reduce carbon & nuclear

Aging infrastructure, asset performance & reliability, asset digitalization

Wholesale and retail market operations, DER aggregation, peer-to-peer trading, Blockchain

Smart appliances, homes, buildings, communities, assets

Where are we headed



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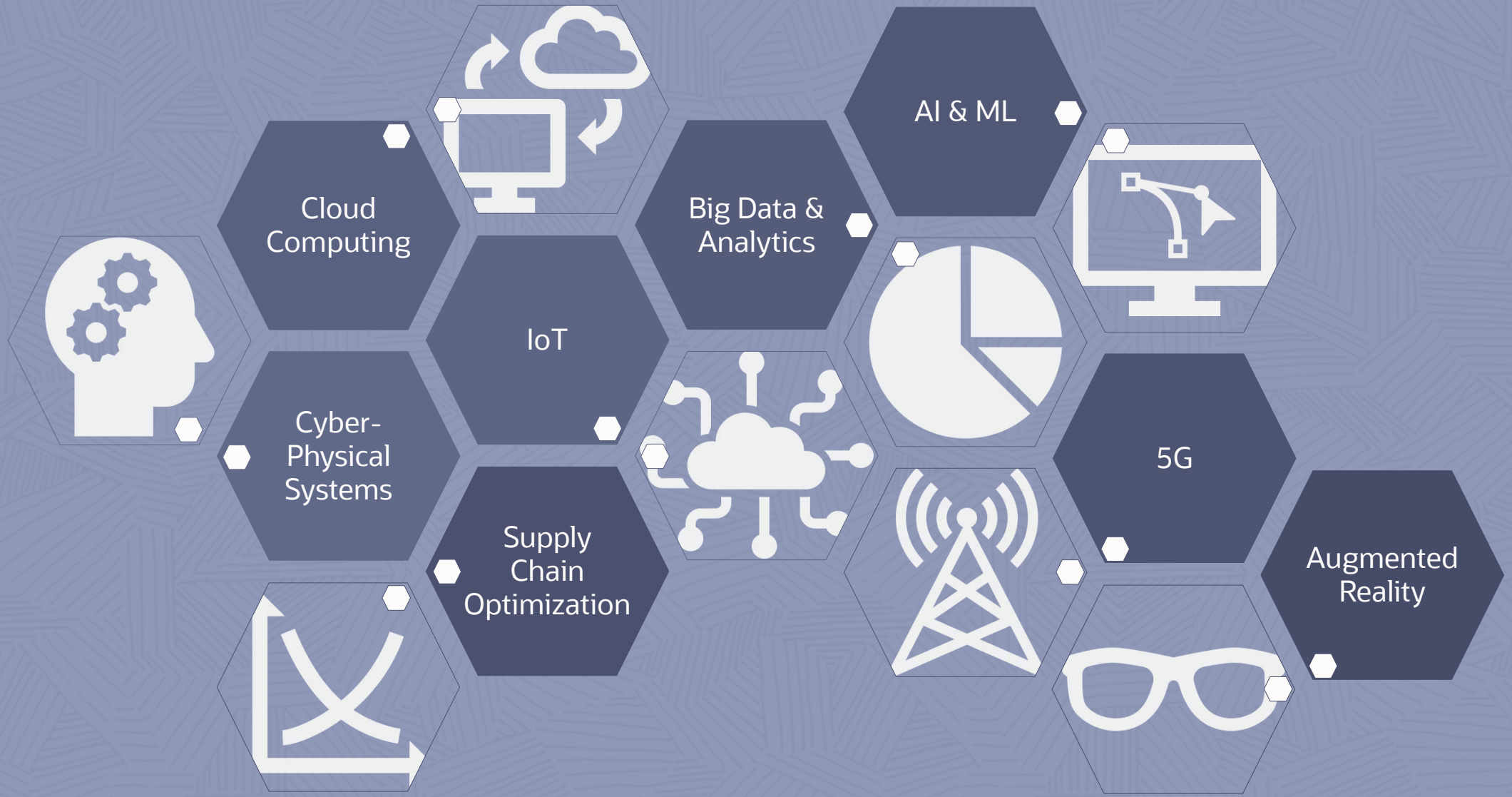

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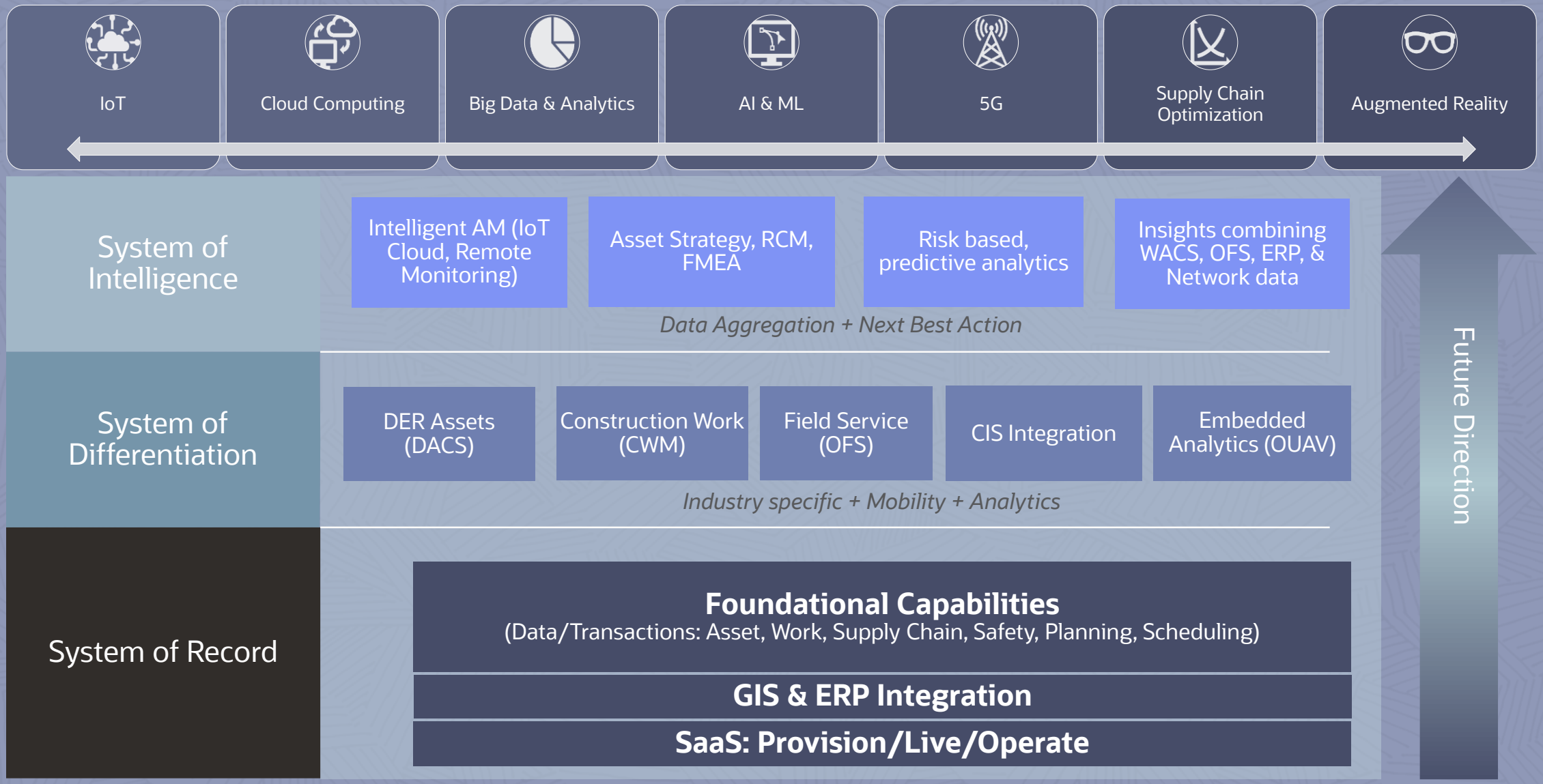
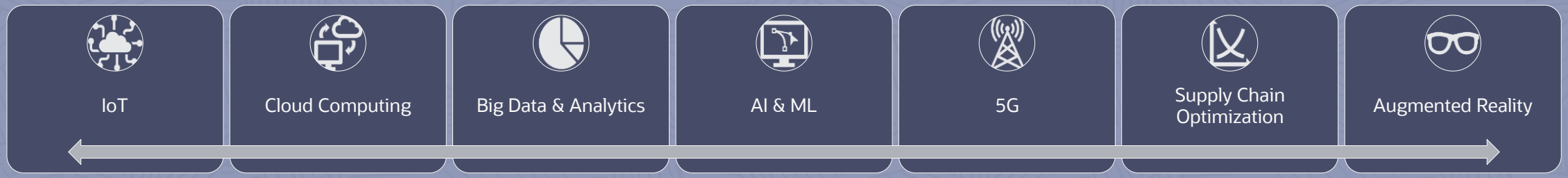


Keeping pace with the macro and industry changes



System of Intelligence

- Intelligent AM (IoT Cloud, Remote Monitoring)
- Asset Strategy, RCM, FMEA
- Risk based, predictive analytics
- Insights combining WACS, OFS, ERP, & Network data

Data Aggregation + Next Best Action

System of Differentiation

- DER Assets (DACS)
- Construction Work (CWM)
- Field Service (OFS)
- CIS Integration
- Embedded Analytics (OUAV)

Industry specific + Mobility + Analytics

System of Record

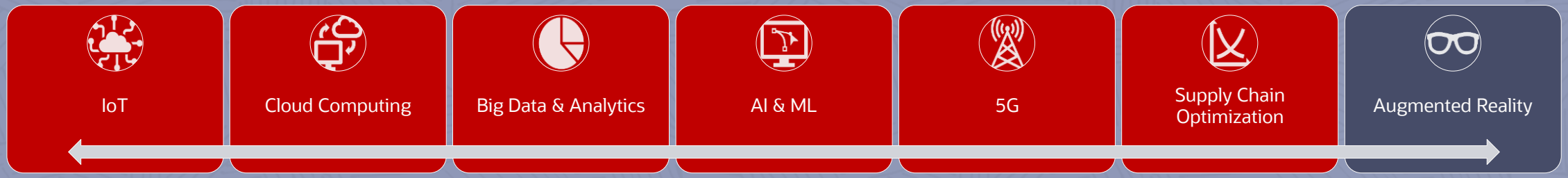
Foundational Capabilities
(Data/Transactions: Asset, Work, Supply Chain, Safety, Planning, Scheduling)

GIS & ERP Integration

SaaS: Provision/Live/Operate

Future Direction

Keeping pace with the macro and industry changes



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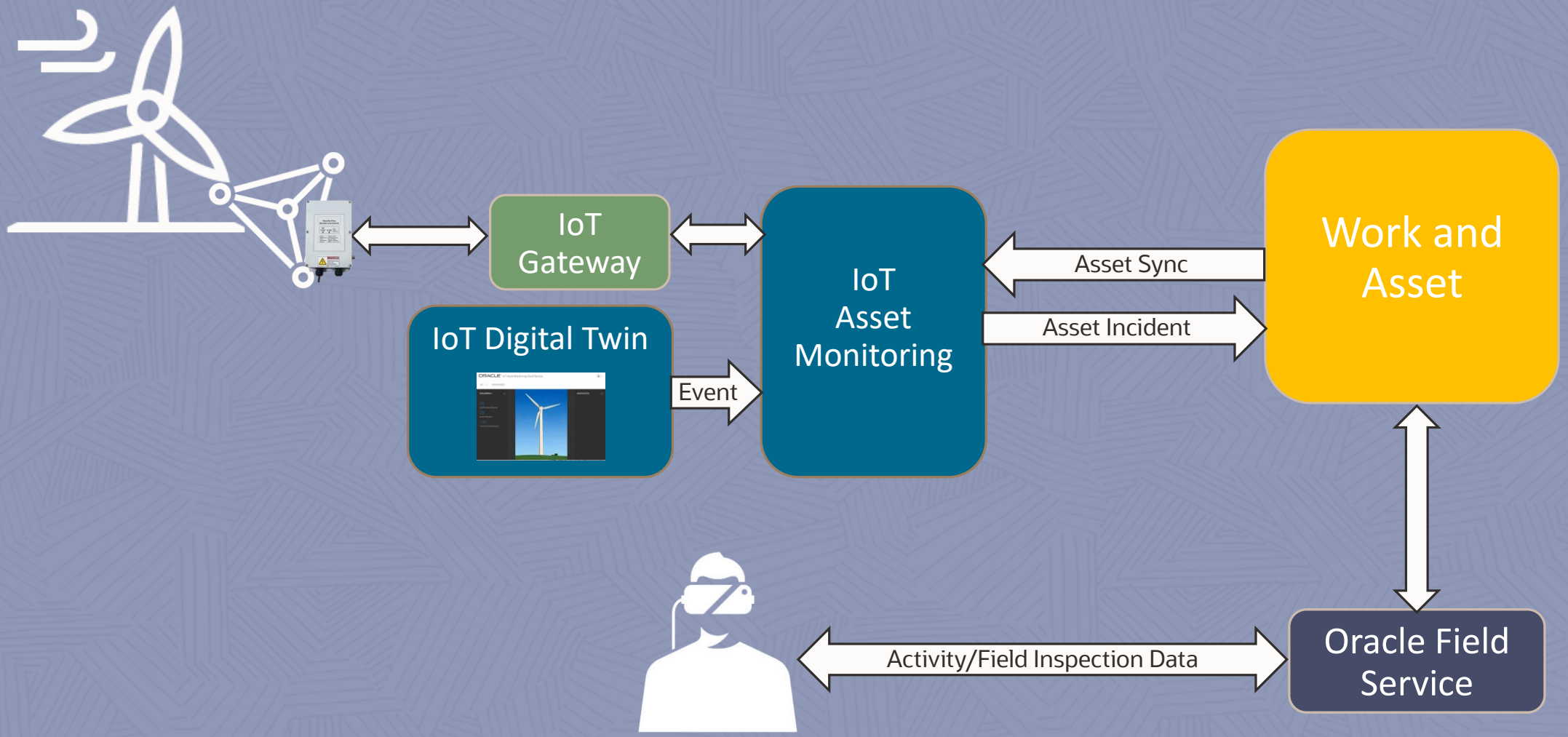
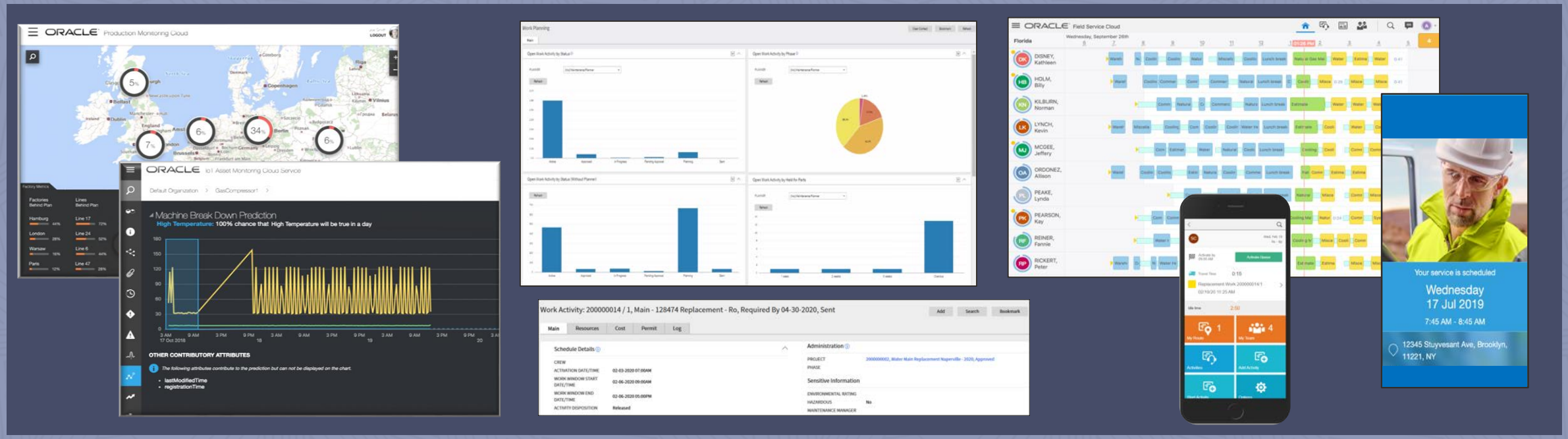
Use Case - IoT Asset Monitoring and Intelligent Asset Management for Wind Turbine



Optimized Asset Management Strategy

IoT Asset Monitoring | Work and Asset | Oracle Field Service

Insights | Exceptions | Work Orders and Activities | Asset Condition | Routing and Tracking | Work Update and Completion



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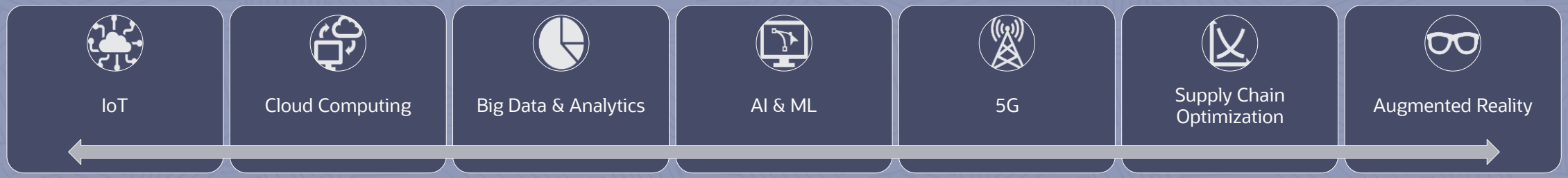

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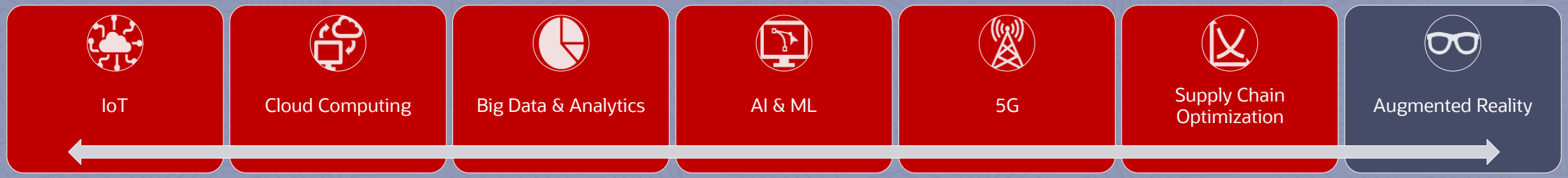

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Future Direction

Use Case – Consequence of High Voltage Transformer Failure

Input

Process

Output

Risk Matrix

Consequences of Failure

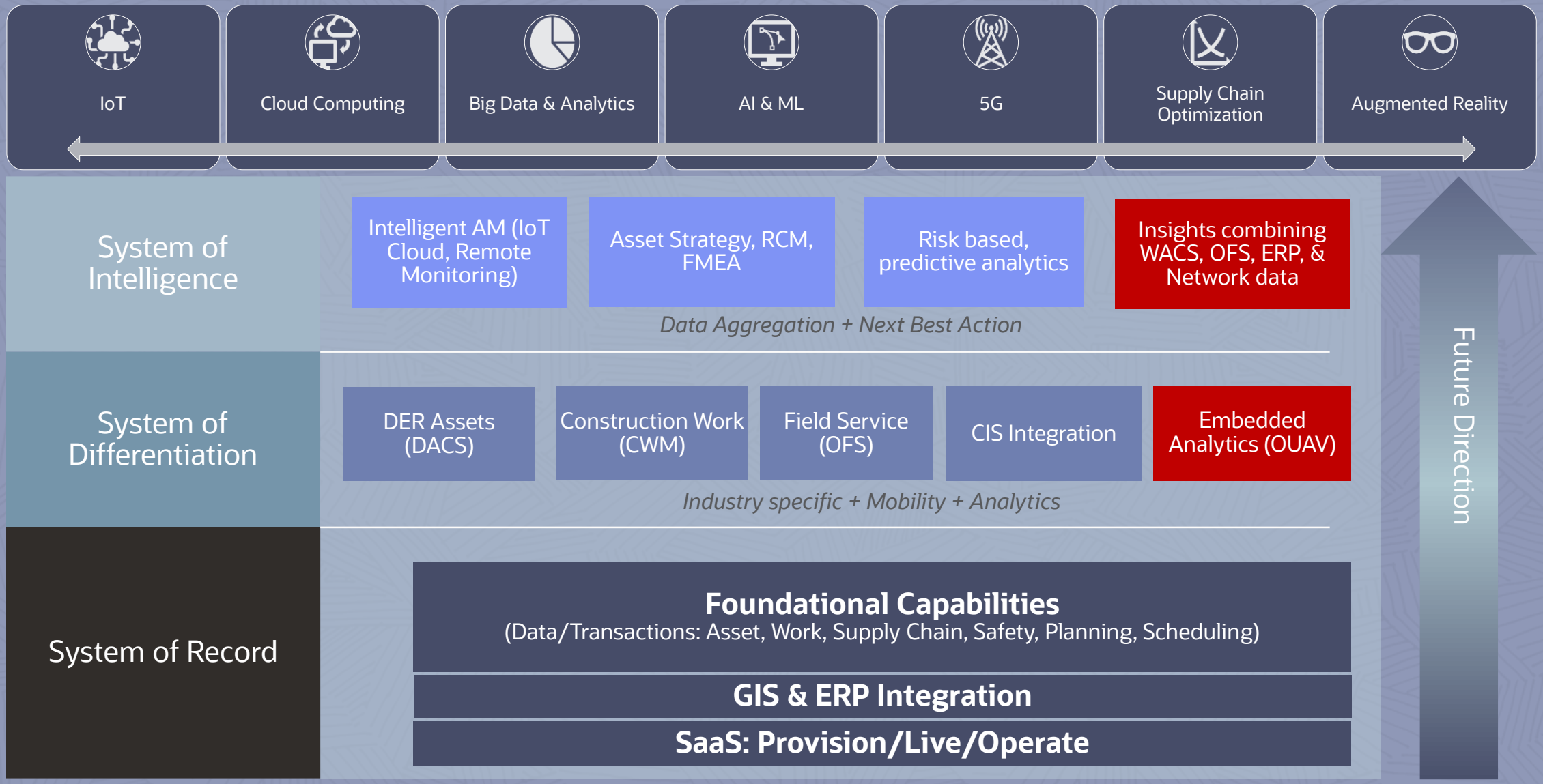
Financial Consequences

Safety Consequences

Environmental Consequences

Network Perf Consequences

Keeping pace with the macro and industry changes



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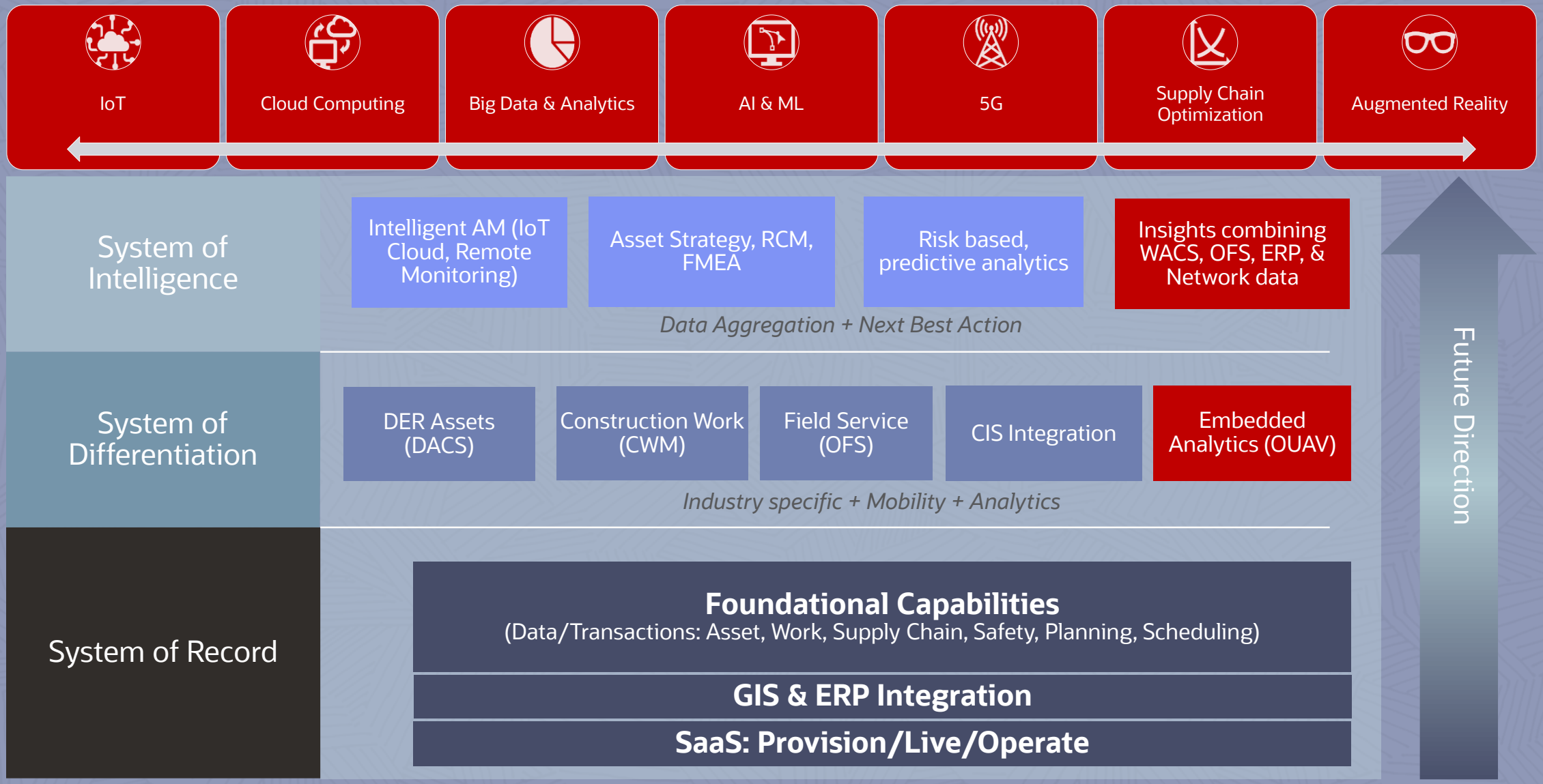
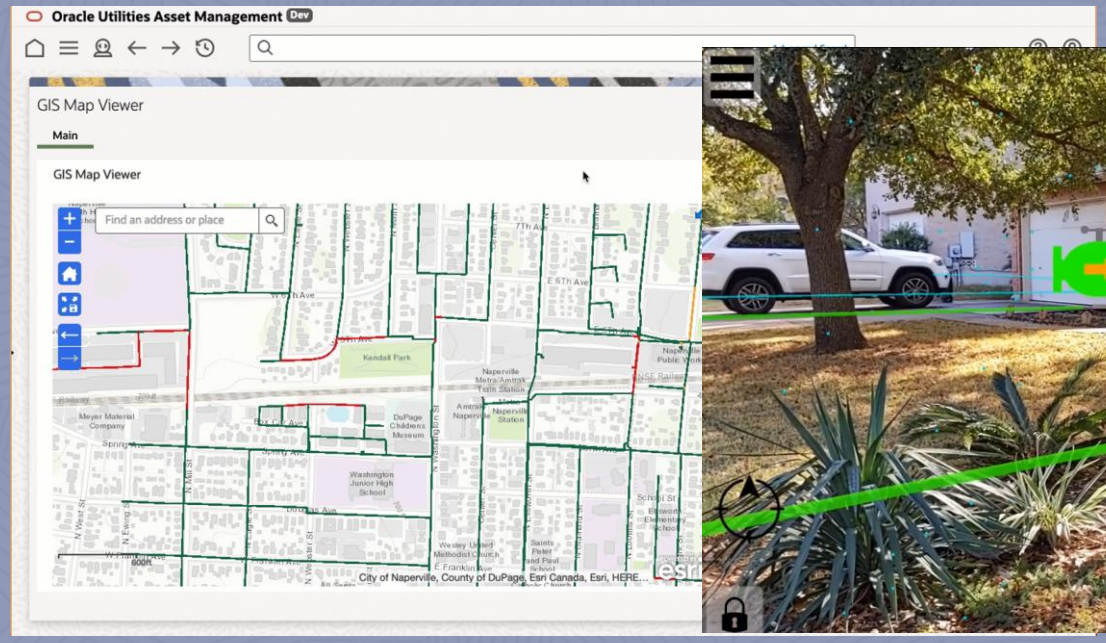


Use Case – Leak Detection and Situational Awareness through Analytics and Augmented Reality

- IoT to feed prediction model for leaks
- While on-site, AR to provide asset information and real-time operating data
- Safety through situational awareness
  - Customer info (critical customer, bad dog)
  - Public data feeds (lightning, police/fire, etc.)



And why care …

If you are in this room …

You're already part of the story …

Your role and impact you will have …

is up to **YOU!**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