

# Intelligence Driven- Unified Operations of Data Centres

Astrikos  
@.ai

KNOWLEDGE PARTNER



8<sup>th</sup> EDITION

**DATA CENTRE INDIA 2021**  
VIRTUAL CONFERENCE

18th NOVEMBER 2021 ♦ 1030-1330 Hrs

ORGANISER



BHARAT EXHIBITIONS

**Dr. Chinmay Hegde**  
CEO & MD - Astrikos Consulting Pvt Ltd

**Astrikos** has developed an expertise in the areas of Technology (ICT/IoT) intervention via Machine Learning, Artificial Intelligence driven capability to Enterprise/Public Policy. Areas of primary expertise and focus are Next Generation Data Centres, Smart Cities, Urban Analytics, Smart Infrastructure, Industry 4.0/5.0 with World Class Manufacturing, Intelligent Healthcare Administration and the Holistic Cyber Security. We encompass design, development, managerial and implementation expertise across domains, on migration/implementation of Industrial Digital Transformation, IIoT/Industry 5.0 through cognitive intelligence and data science solutions under **Astrikos.ai framework**. We have grown multi-fold during last few years in the Indian as well as international market space by acquiring marquee clientele & major MNC partners across geographies.

## Unique Perceived Benefits:

- Recognized as one of the niche Innovative Startups, out of about 200 selected companies (in a field of over half a million startups) by Govt. of India to avail three years income tax incentives/holiday
- Patent pending with a provisional approval for **Astrikos.ai S!aP** – AI/ML Platform
- Successful **Go-Live Commissioning** of **three** Smart City projects and **four** Crisis Response platform implementations
- Key personnel of Astrikos are currently on mentorship boards of renowned universities
- Recognized as one of the Smart Cities Framework and Business Model expert corporates

## QUALITY MATURITY CERTIFICATIONS



## AWARDS AND RECOGNITIONS



## PRODUCT MATURITY CERTIFICATIONS





**INTELLECTUAL  
PROPERTY INDIA**  
PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS



सत्यमेव जयते

## Application Filing Receipt

### Government of India Patent Office

Intellectual Property Office Building,  
G.S.T. Road, Guindy,  
Chennai -600032  
Phone- 044-22502081-84  
Fax: 044-22502066  
e-mail: chennai-patent@nic.in

**CBR Number : 17889**

**CBR date: 17-05-2021**

Application Type: ORDINARY APPLICATION

Priority Number:

Priority Date:

Priority Country: Not Selected

**Patent  
Pending**

To,


Astrikos Consulting Private. Limited

Astrikos Consulting Private. Limited #129 KR ROAD, BASAVANAGUDI, BENGULURU KARNATAKA INDIA 560004


Received documents purporting be to an application for patent numbered 202141022044 dated 17-05-2021 by Astrikos Consulting Private.

Limited of #129 KR ROAD, BASAVANAGUDI, BENGULURU KARNATAKA INDIA 560004 relating to **COGNITIVE INTEROPERABLE INQUISITIVE**

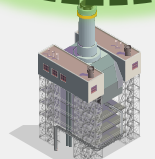
**SOURCE AGNOSTIC INFRASTRUCTURE OMNI-SPECIFICS INTELLIGENCE PROCESS AND SYSTEM FOR COLLABORATIVE INFRA SUPER DILIGENCE**




Data Centers / Cloud Infrastructure Analytics




Urban Infrastructure Analytics




Industrial Infrastructure Analytics



Utility Infrastructure Analytics

A light grey rounded rectangle containing four isometric icons representing different infrastructure sectors: data centers, urban buildings, industrial plants, and utility trucks. The "Data Centers / Cloud Infrastructure Analytics" icon is highlighted with a green dashed circle.

Healthcare Infra Administration



Crisis, Disaster or Pandemic Management

A light grey rounded rectangle containing two isometric icons: a hospital building and a rescue boat with two people.

WCCD  
ISO 37120



ISO

**ISO 37122:2019**  
Sustainable Cities & Communities - Indicators for Smart Cities

**ISO 37120:2018**  
Sustainable Cities & Communities - Indicators for City Services & Quality of Life

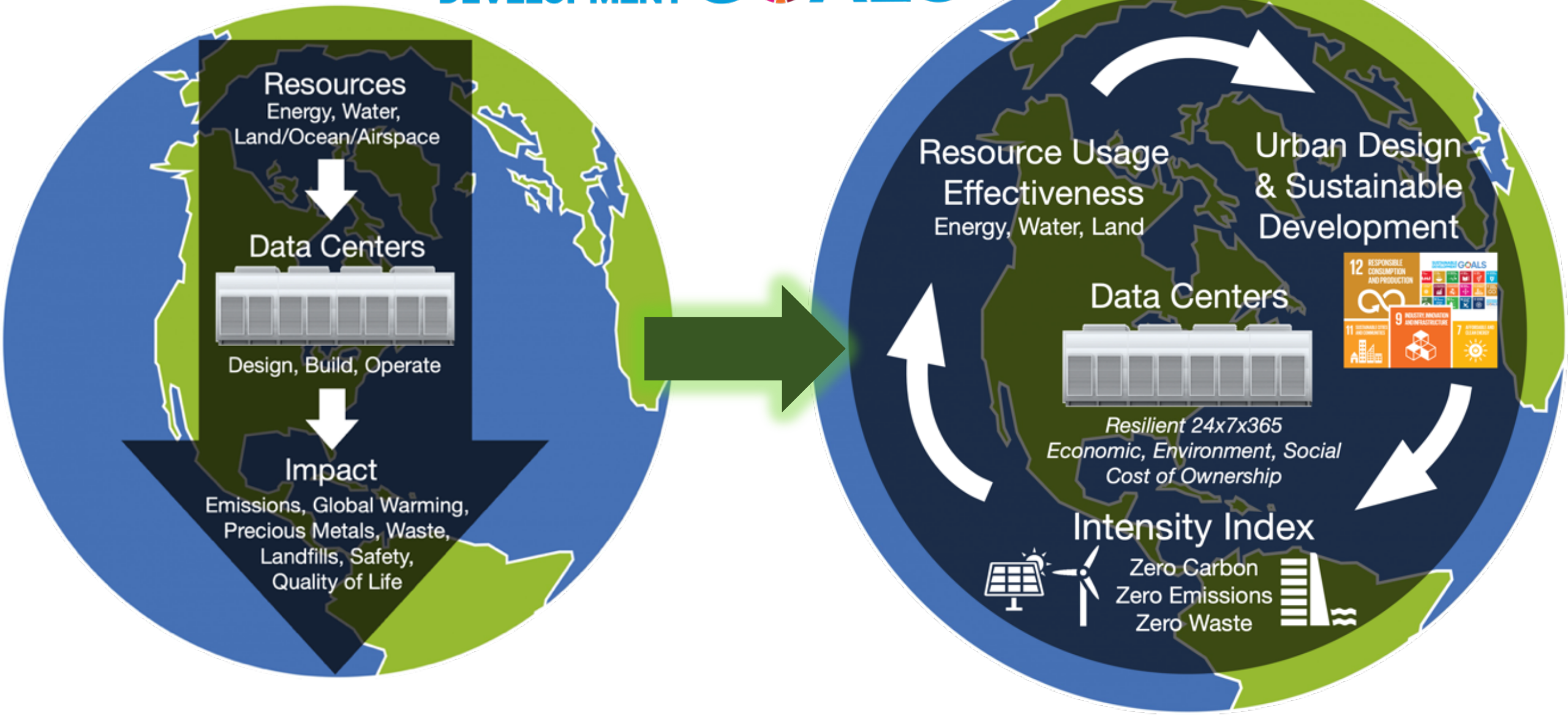
**ISO 22320:2019**  
Security & Resilience - Emergency Management - Guidelines for Incident Management & Response Mechanism

A light grey rounded rectangle containing logos for WCCD (World Council for Sustainable Cities) and ISO, followed by three specific ISO standards related to smart cities and emergency management.

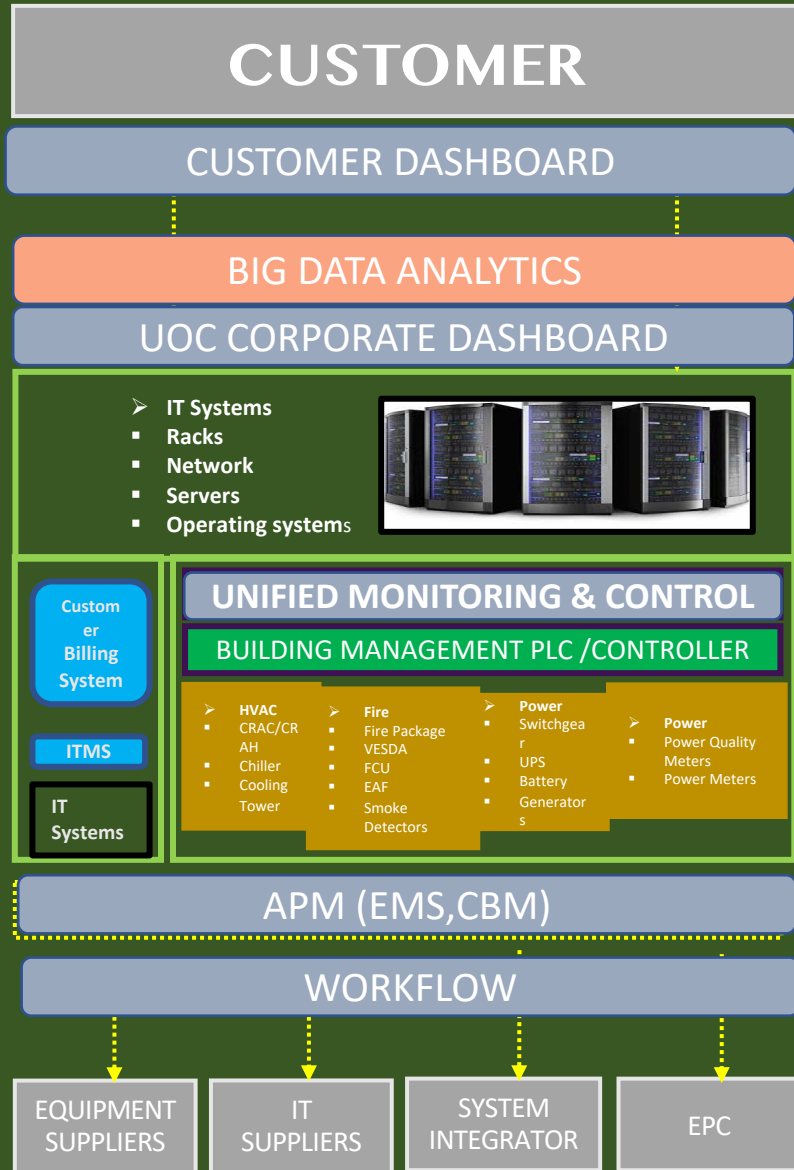
**GLOBAL STANDARDS**

# Need Analysis: Sustainability Impact – Data Center

## SUSTAINABLE DEVELOPMENT GOALS



# UNIFIED OPERATIONS MANAGEMENT FOR DATA CENTRE



BIG DATA ANALYTICS

DIGITAL TWIN

## DIGITAL TRANSFORMATION

### Visibility Portal (Customer, Internal, Vendor )

- Dashboard
- Asset & Service Performance
- Real time visibility of critical alarm & alerts
- Visibility on Incidence management

### Integration and Monitoring Platform

- IT and OT system integration capability
- Integration with heterogenous HW
- Visibility of critical alarm, Alerts and incidences
- Real Time KPI monitoring
- Asset performance monitoring
- Dashboards and reports

### Asset Performance Management

- Asset tracking
- Asset preventive maintenance
- Asset Predicative maintenance

### Workflow Management

- Alarm & Alert escalation
- Tracking response and service levels

## DESIRED OUTCOME

**Growth**  
Retention & growth of premium client base

**Predictability**  
Higher efficiency, reliability, lower cost ops

**Enterprise Visibility**  
SLA's, Energy Utilization, Resource Utilization , Critical Alarms, Response time, Incidences

**Standardization**  
Across geo reducing TCO and ease of use

**Resource optimization**  
Process automation - reduction in cost

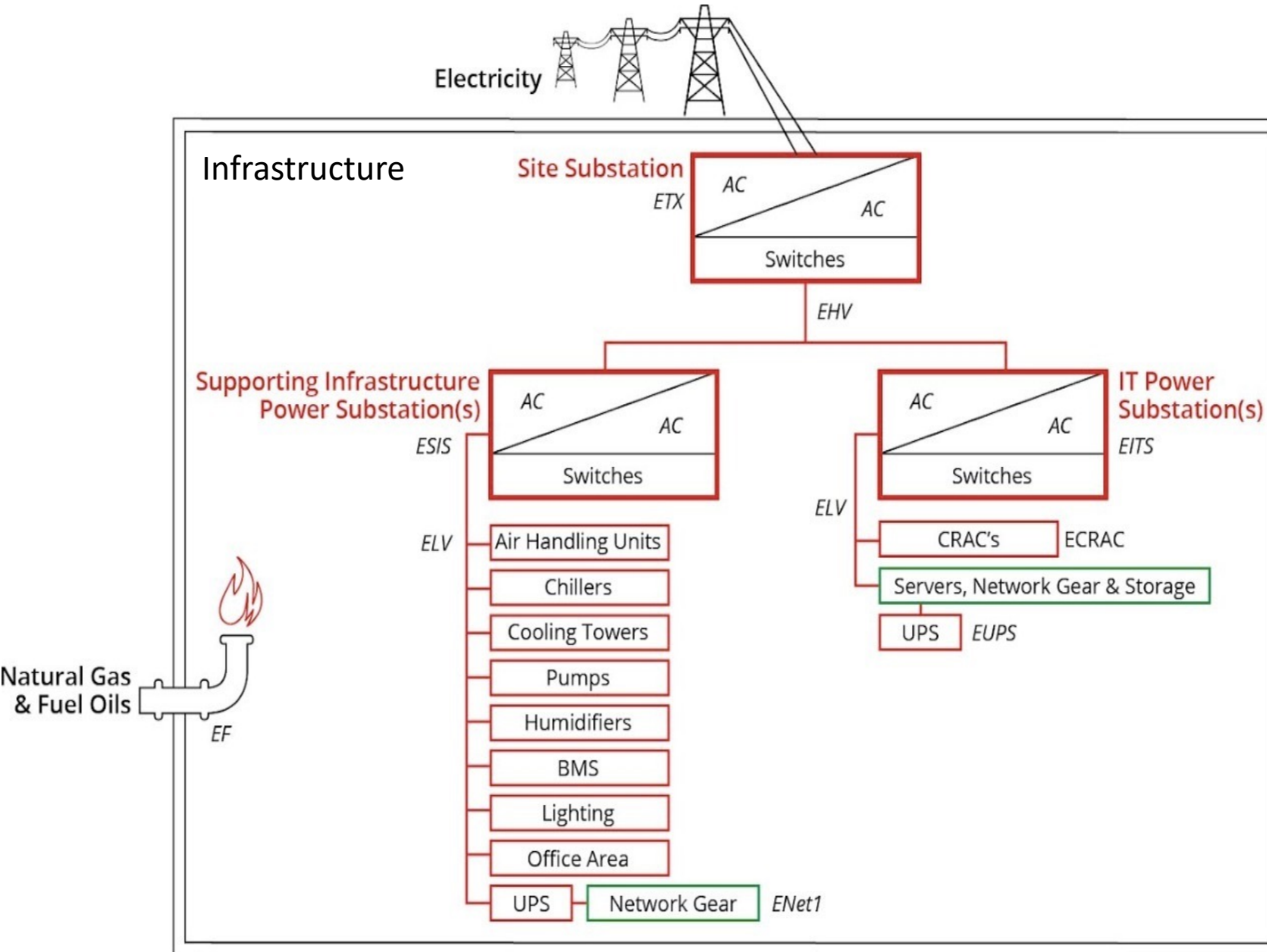
**Asset Performance**  
Reduction in O&M cost and down time

**SLA Performance**  
Automated escalation & tracking of incidences

CUSTOMER MANAGEMENT

Sustainability of operations

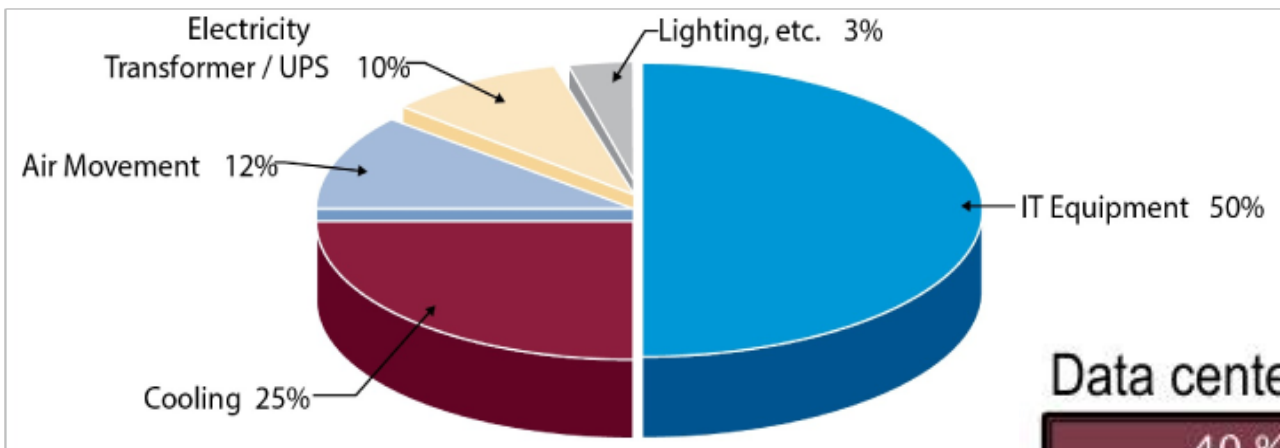
SUPPLIER MNGT



$$PUE = \frac{ESIS + EITS + ETX + EHV + ELV + EF}{EITS - ECRAC - EUPS - ELV + ENet1}$$

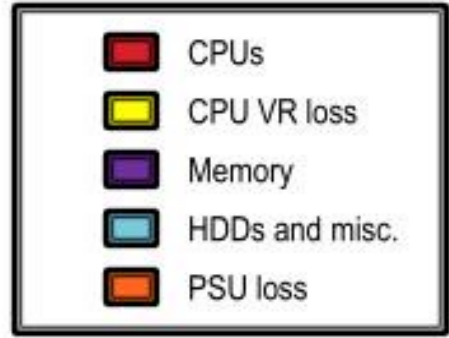
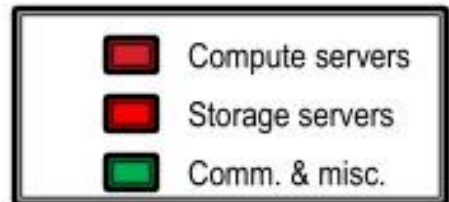
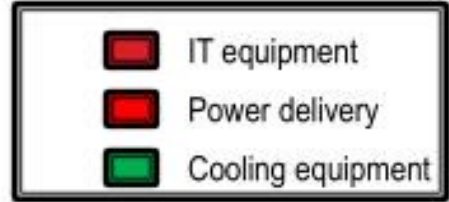
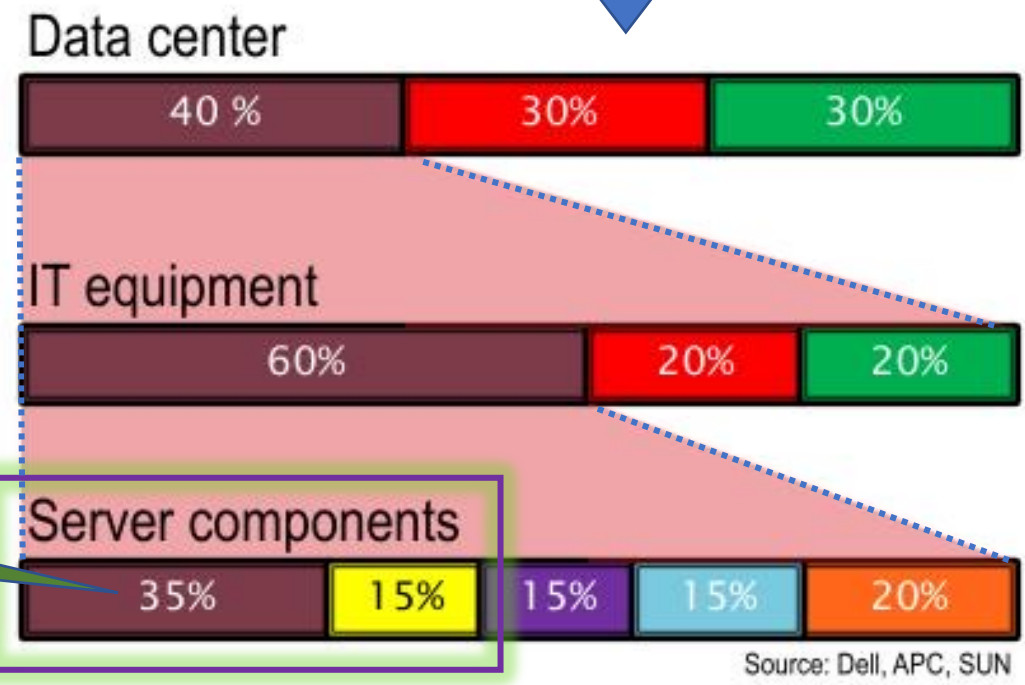
- ### What else?
- History and trends
  - Insights with cause-effect analysis
  - Prediction based on heterogenous data sources
    - Including sub-parameters
  - Prescription advisory– “how to plan and act to do better?”

# Need Analysis: Data Center Energy Consumption



Source: EYP Missions Critical Facilities Inc., New York

Cooling consumes 25% - 33% of power



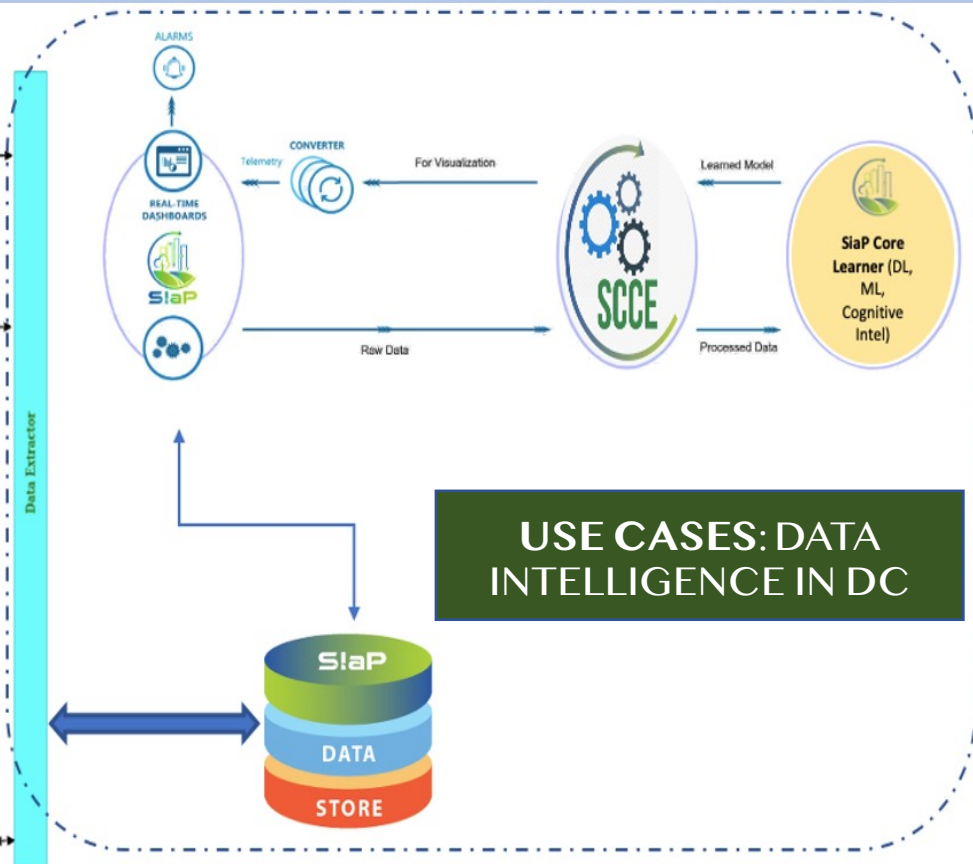
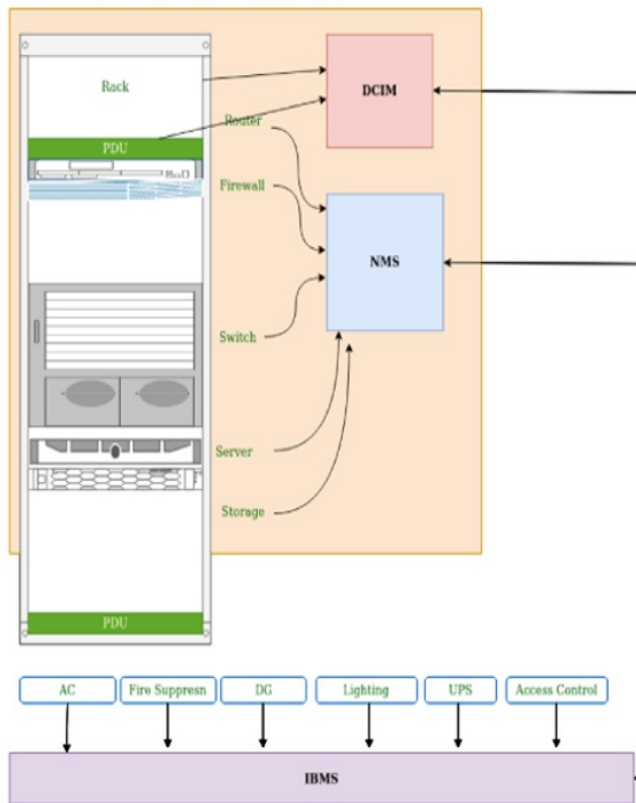
Source: Dell, APC, SUN

CPU uses about 10%-15% of total Data Centre power

The breakdown leaves room for plenty of areas of improvement.



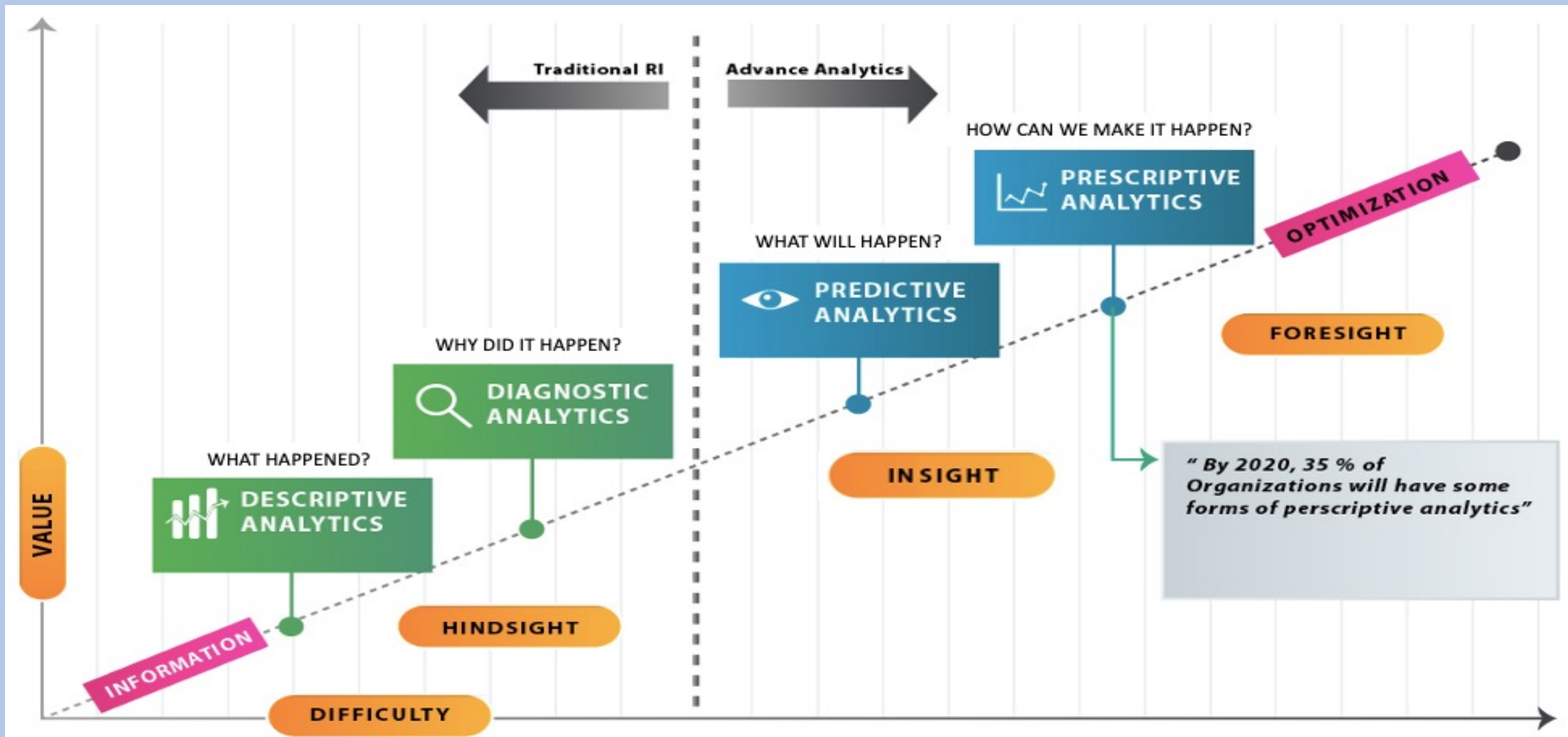
### DATA CENTER INFRASTRUCTURE



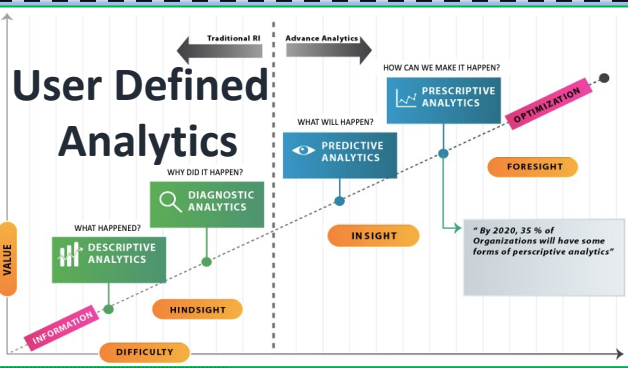
### USE CASES: DATA INTELLIGENCE IN DC



CASE	EXAMPLE
<b>Regression Analytics</b>	<ul style="list-style-type: none"> <li>Power utilization trend analysis and Power Utilization Effectiveness</li> <li>DC temperature trend analysis and effectiveness analysis</li> <li>Resource allocation analysis – Racks, Spaces, Floor Area, Power, Compute</li> </ul>
<b>Insights</b>	<ul style="list-style-type: none"> <li>High energy consumption clusters</li> <li>Thermal Profile of the floor</li> <li>Floor susceptibility zoning and demarcation</li> <li>Service Management Health Indices</li> </ul>
<b>Prediction Analytics</b>	<ul style="list-style-type: none"> <li>Power forecasting – shortage analysis, requirement planning</li> <li>Cooling anomaly predictive detection</li> <li>Rack/Module health rating and fault prediction</li> <li>Segmental failure forecasting</li> <li>Bandwidth forecasting</li> </ul>
<b>Correlative Analytics</b>	<ul style="list-style-type: none"> <li>Relational analysis of bandwidth consumption and power consumption</li> <li>Relation between Data security compute load (multiplied duty) and resource load</li> <li>Influence of compute segment's performance on DC environment and temperature</li> </ul>
<b>Collaborative Analytics</b>	<ul style="list-style-type: none"> <li>IT components health v/s Environmental Influences</li> <li>Resource utilization trend v/s Power requirement trends and forecasts</li> <li>Thermal Profile v/s Energy demand analysis</li> <li>Root cause predictive analytics based on heuristics and cognitive analysis</li> </ul>
<b>Prescriptive Advisory</b>	<ul style="list-style-type: none"> <li>Remediation advisory for power demand/optimization/planning</li> <li>Remediation advisory for environmental control optimization</li> <li>Capacity Planning advisory for rack space, modules, compute</li> </ul>



# DATA SCIENCE IN UNIFIED DC OPS



**PRESCRIPTION ADVISORIES & ACTIONS**

Energy Advisories

Added power down for SEGMENT 5 between 6:30PM to 8:30PM. PUE improvement by 2.3%. [Know More](#)

It is advised to schedule a maintenance for:

Switching Panel in LV network (LV17-12) in Main may need maint. [Know More](#)

UPS system SAVD-16 battery bank <+> draining at <+> every week... [Know More](#)

**ACT**

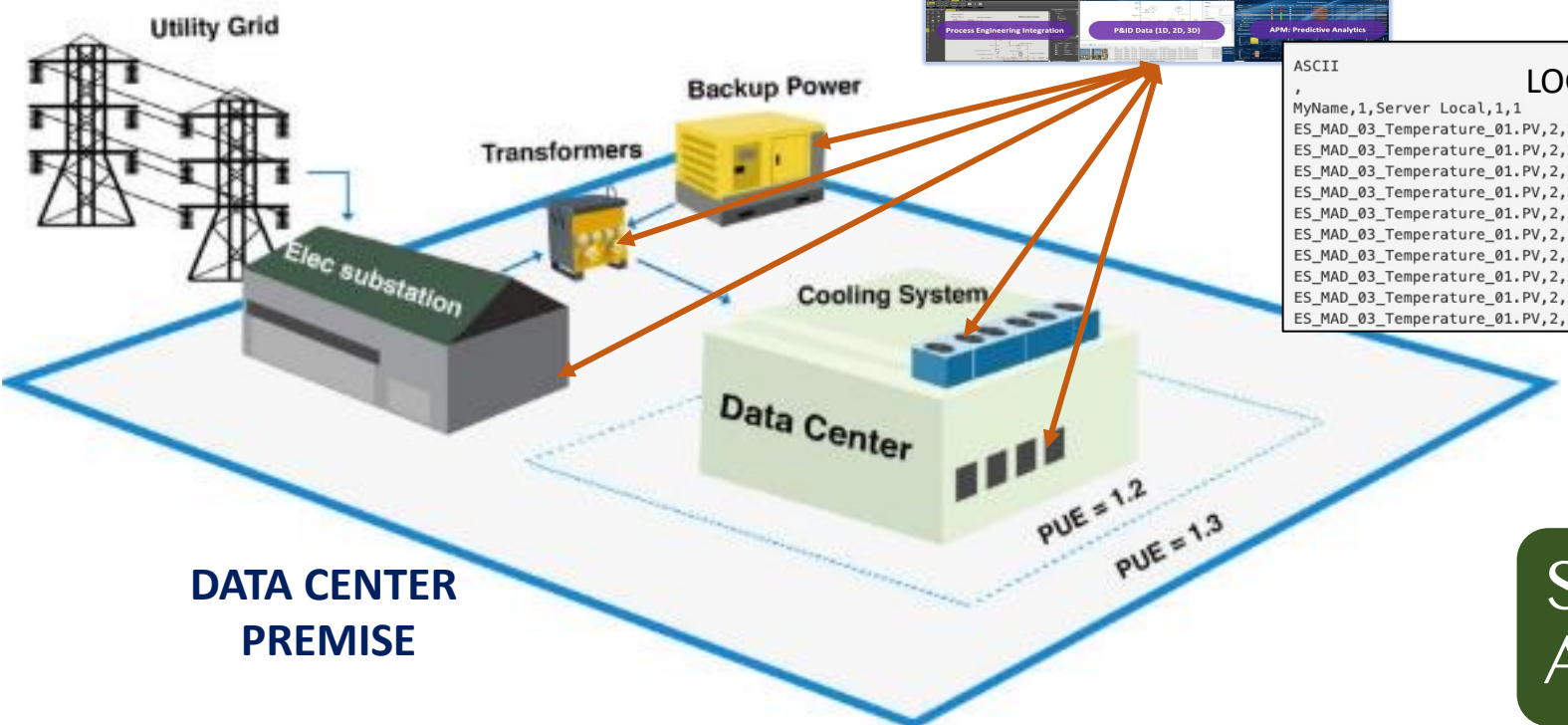
- Raise work order for Asset Maintenance Management
- Raise workflow for Business Process Management
- Create a policy for device/equipment Control



**UOC**

- Financial Context
- Engineering Information with Operational context
- Maintenance Context
- Real-time Operational Displays
- Interface to specific applications (Operating window, HSE etc.)
- Process Engineering Integration
- P&ID Data (1D, 2D, 3D)
- APM: Predictive Analytics

**ACTIONS LINKED BACK TO Ops PLATFORM**



**LOGS/EVENTS SAVED IN HISTORIAN**

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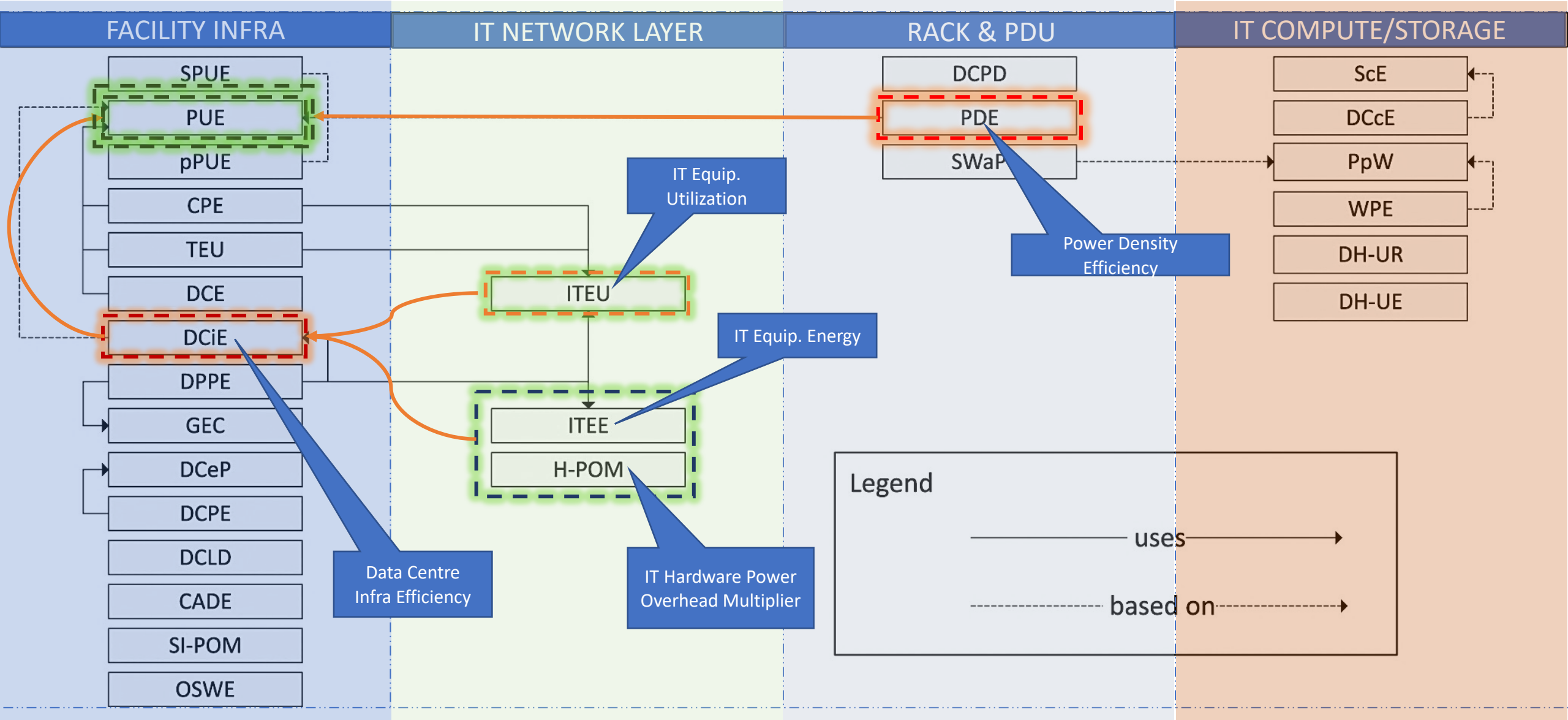
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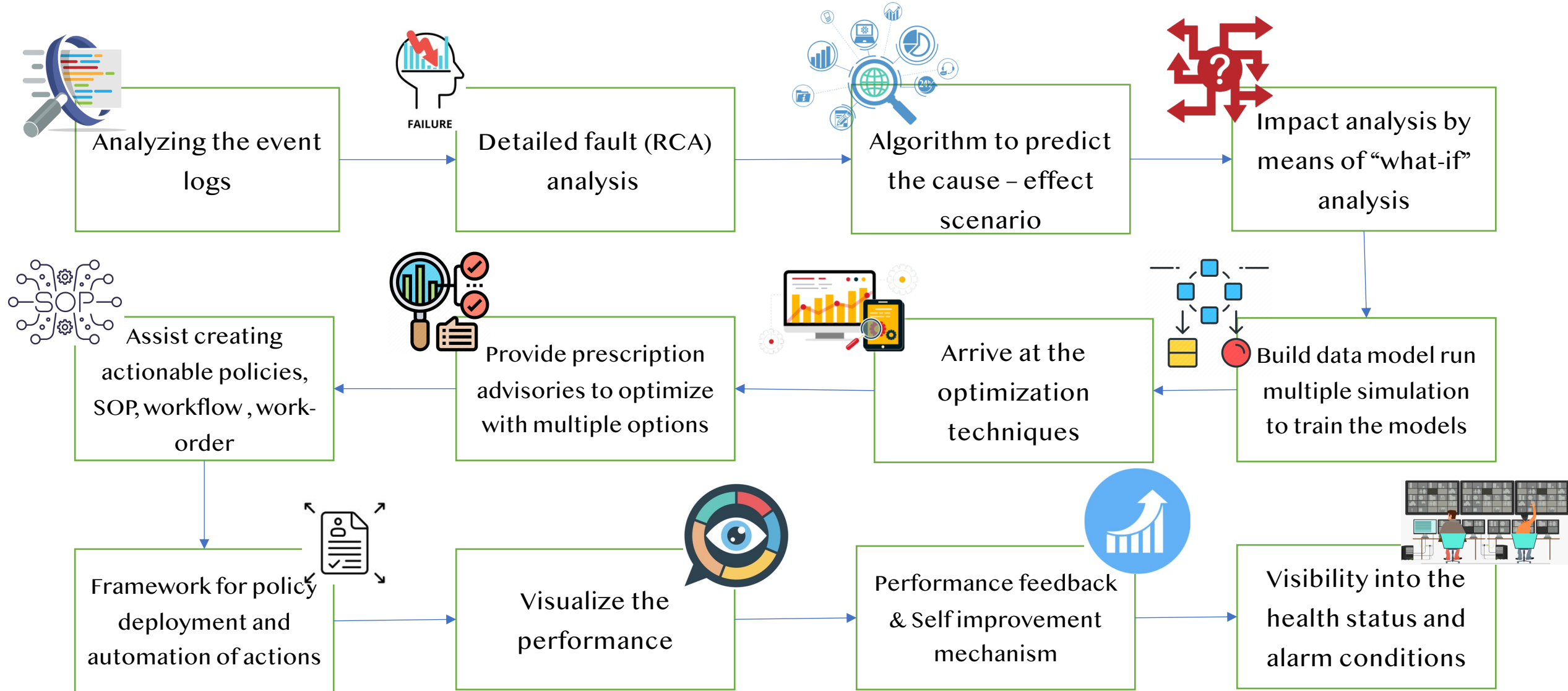
**S!aP For DC: SOLUTION ARCHITECTURE**

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# Energy KPI Dependency Matrix – PUE, DCE, DCiE



# Data Centre Operational Analytics – IT/OT Convergence



# AUDIT AND SELF-ASSESSMENT

## Analytics driven self-assessment module for:

- Sustainable Energy Efficiency Compliance
- Data Center Compliances
- Sustainable Occupancy Compliance
- Enabling Equipment Sustainability
- Advisories to fill-in gaps and white spaces
- Action points to induce operational excellence by bi-directional integration with Unified Platform
- ML driven analytical reports for compliance health check



**ISO/IEC 30134**

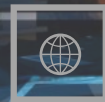


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# Thank You!