ABB DATA CENTER FORUM 2017, 11 JULY 2017, TUESDAY

Intelligent Data Needs Intelligent Power – Next generation data center

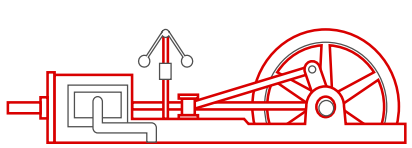
Dave Sterlace, Global Head of Technology, Data Centers, ABB

Industrialization of the Data Center

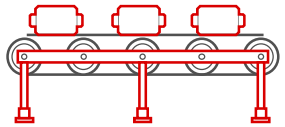
What it means and why it matters to you.



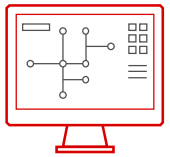
We are in the 4th industrial revolution



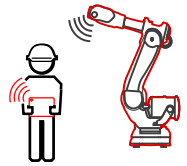
1712 – Industry 1.0



1870 – Industry 2.0



1969 – Industry 3.0



Today – Industry 4.0

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ABB in summary

$1.4 billion
invested in R&D in 2015

490 TWh energy saved
by ABB drives

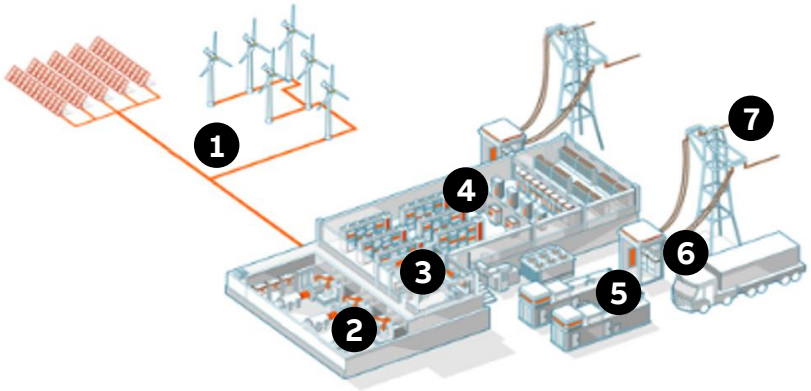
$36.4 billion
orders in 2015

135,000
employees

5,600 training sessions
during global safety week

50% of revenues
related to energy efficiency and renewable energy

ABB in the data center industry



1. Smart grid and micro grids
2. Motors and drives
3. Data center infrastructure management
4. Complete power train
5. Emergency power
6. Grid connections
7. Service, maintenance, repairs, upgrades

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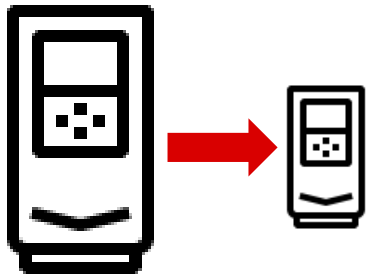
Characteristics of the industrialized data center

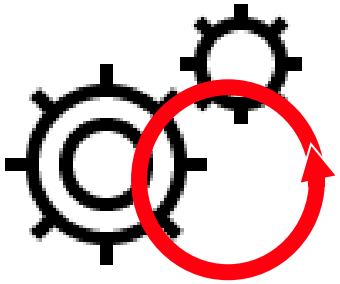
Space savings



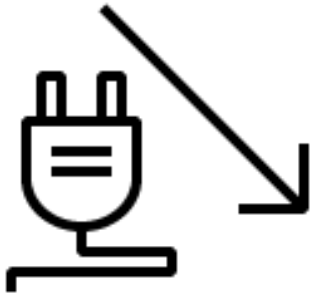
Modularity/Flexibility



Continuous operation



Efficiency



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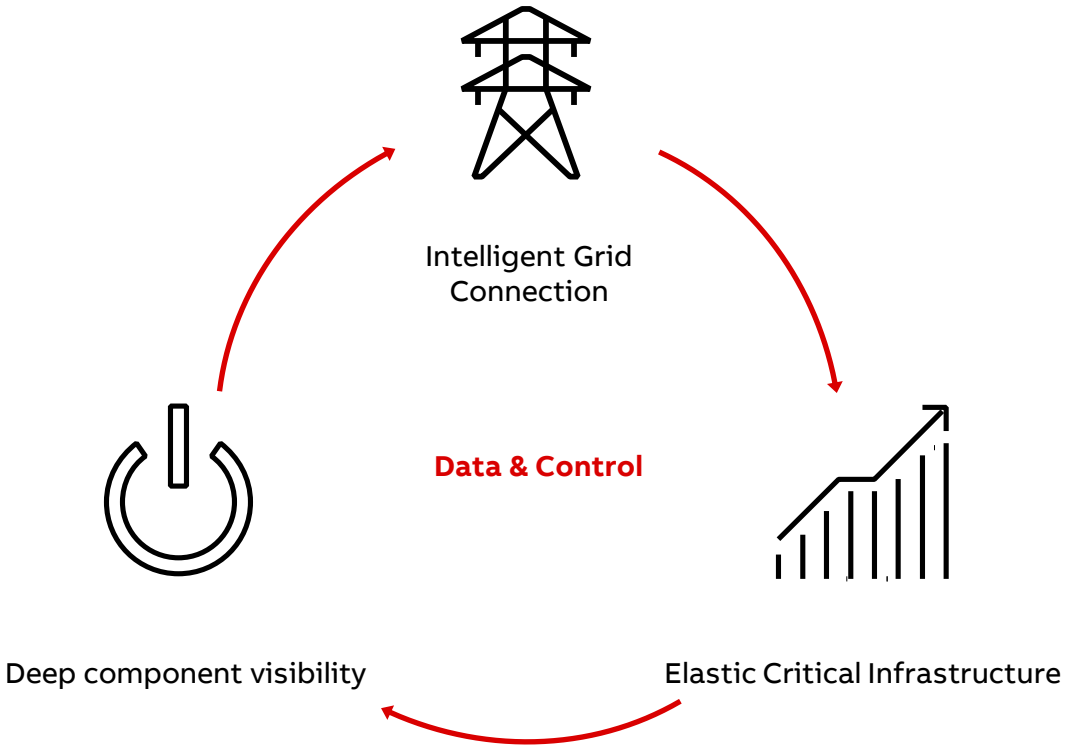
Characteristics of the industrialized data center



IoT Attributes

Smarter, larger, and more secure

Unprecedented scale



Wireless



Latency



Security



Flexibility



Visibility



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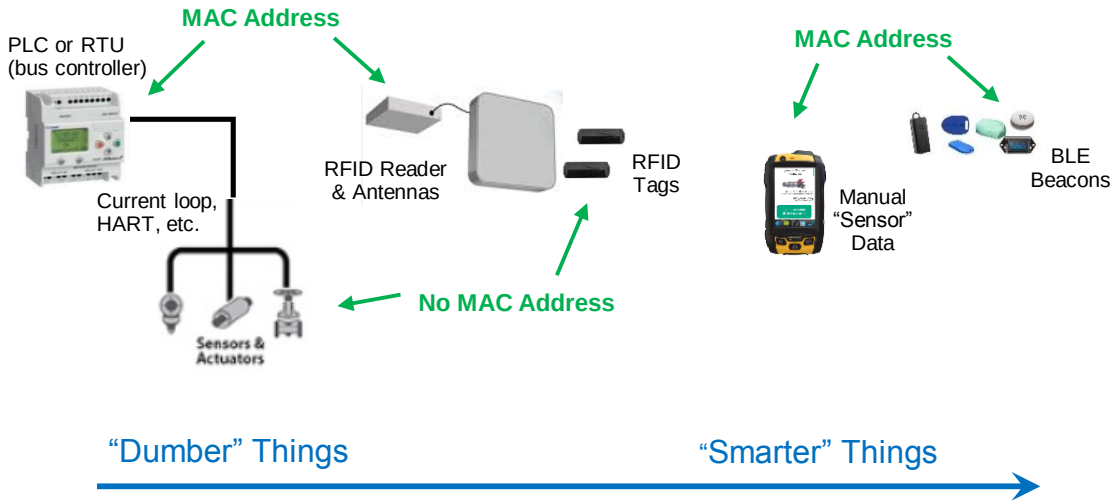
Industrial Internet of Things

One differentiator has to do with the types of the sensors and actuators that make up the “things”

- A large number of sensors/actuators exist that do not have a MAC address or other global unit identifier
  - Cannot be contacted directly using “Internet” or “cellular” protocols
  - Utilize a proprietary or specialty “open” bus in order to communicate
  - The bus controller has a MAC address
- IIoT is a combination of legacy “dumber” sensors and newer, “smarter” sensors

Another differentiator contrasts Operations Technology (OT) with IT

- IIoT usually contains a significant OT component which must interact with the IT component

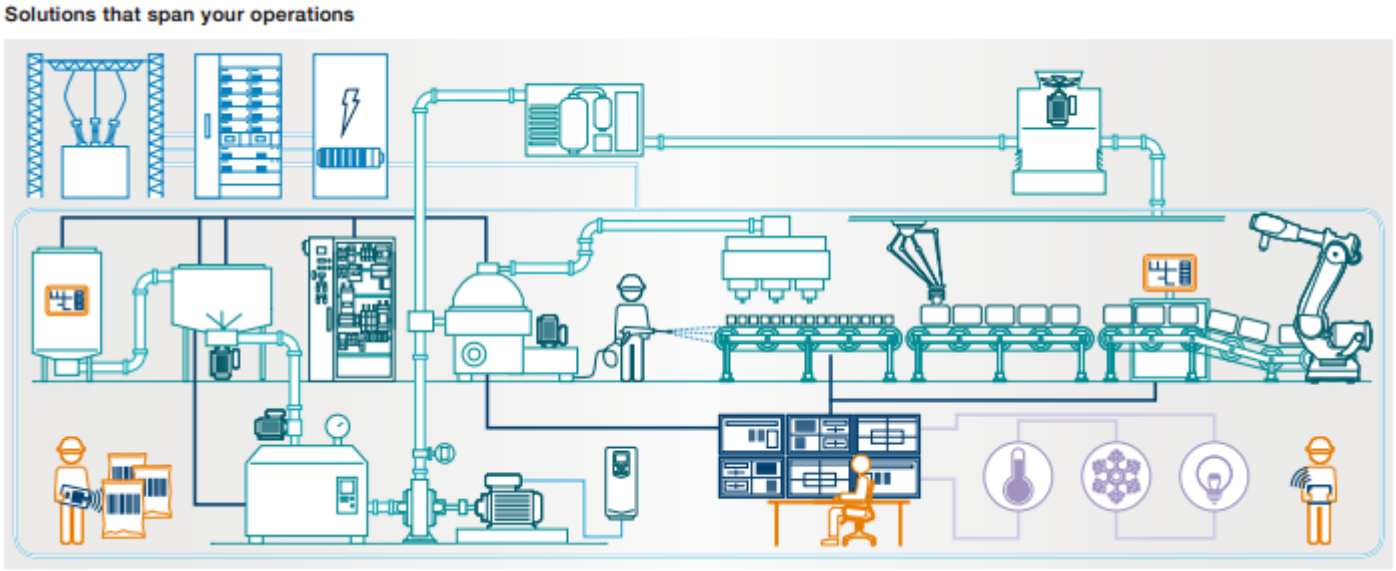


Slide courtesy of Hewlett Packard Enterprise

End to end digitization

Intelligent data needs intelligent power

- The Industrial Internet of Things (IIoT) is how we will industrialize the data center
- IIoT provides the platform to connect IT to OT
- This will lead to lower operating costs.
- Software to dynamically define your capacity, operations & infrastructure



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Digitization of controls is a critical building block

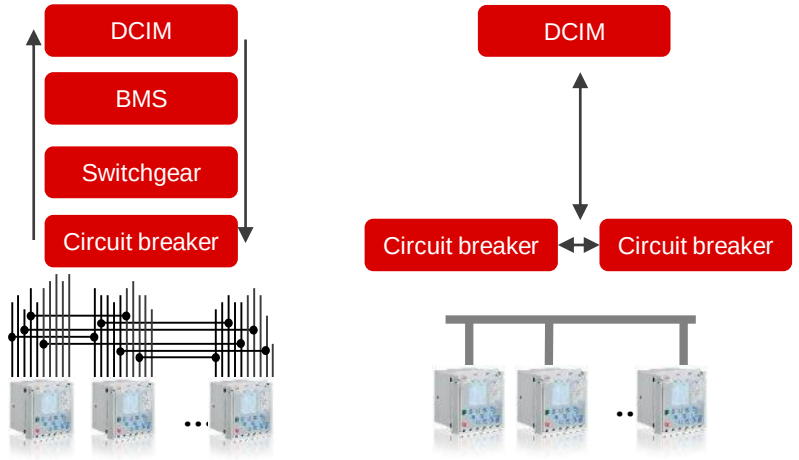
Smart Components

Speaking directly to the cloud with important metrics like contact wear, changing maintenance paradigms



Emax 2

End of multiple control layers



Scale demands simplicity

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What about “dumb” devices?

Easy retrofit

– Simple add on device
– Remotely monitors motor condition.
– Transfers data to cloud for analysis.



Some devices are already smart

Connected devices

– “Speaks” 8 industrial control networking languages including IEC61850
– Real time load management
– Available ATS & Genset control



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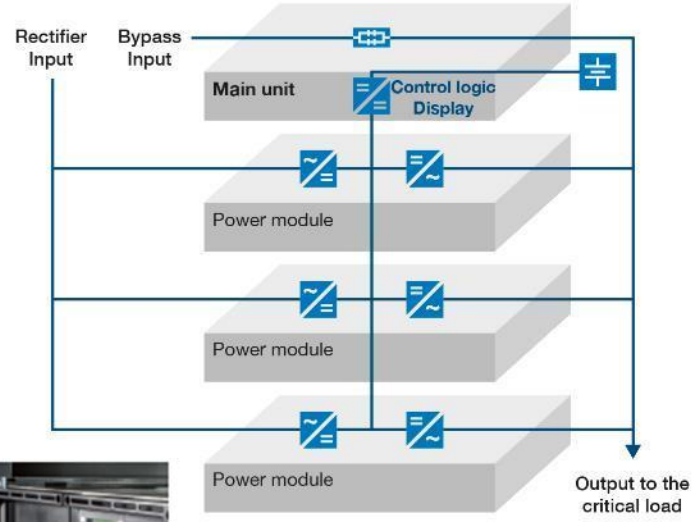
Some approach scalability in a new way





Traditional



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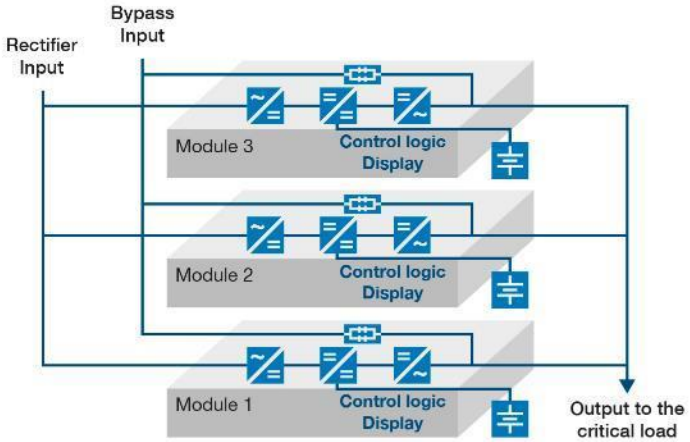

Scalable Infrastructure “pay as you grow”

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Control and communication becomes digital

Easy, Safe, Reliable, Compact

- Can reduce wiring by up to 90%
- Truly open protocol IEC61850/GOOSE peer to peer communication
- Can reduce switchgear size and material costs by up to 25%



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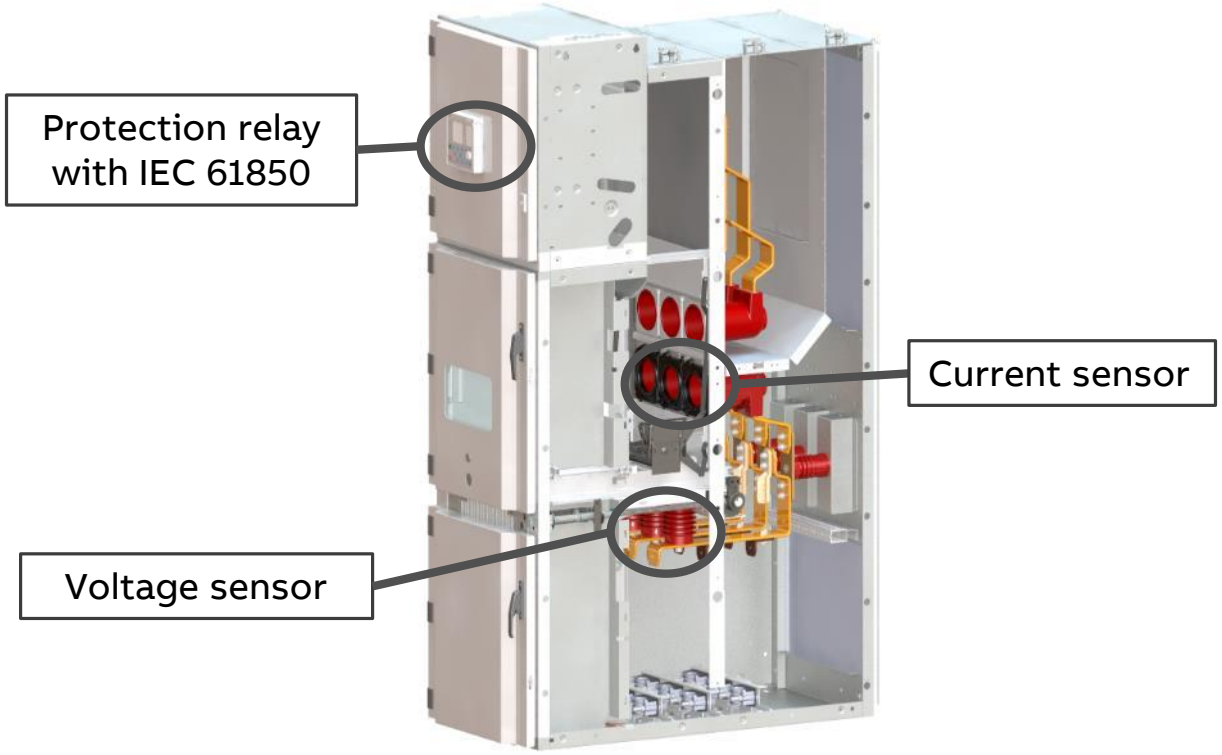
...to make smart assemblies, like Unigear Digitial..



Current transformer



1pc = 20kg

Voltage transformer



1pc = 30kg

3x20 + 3x30 = 150kg

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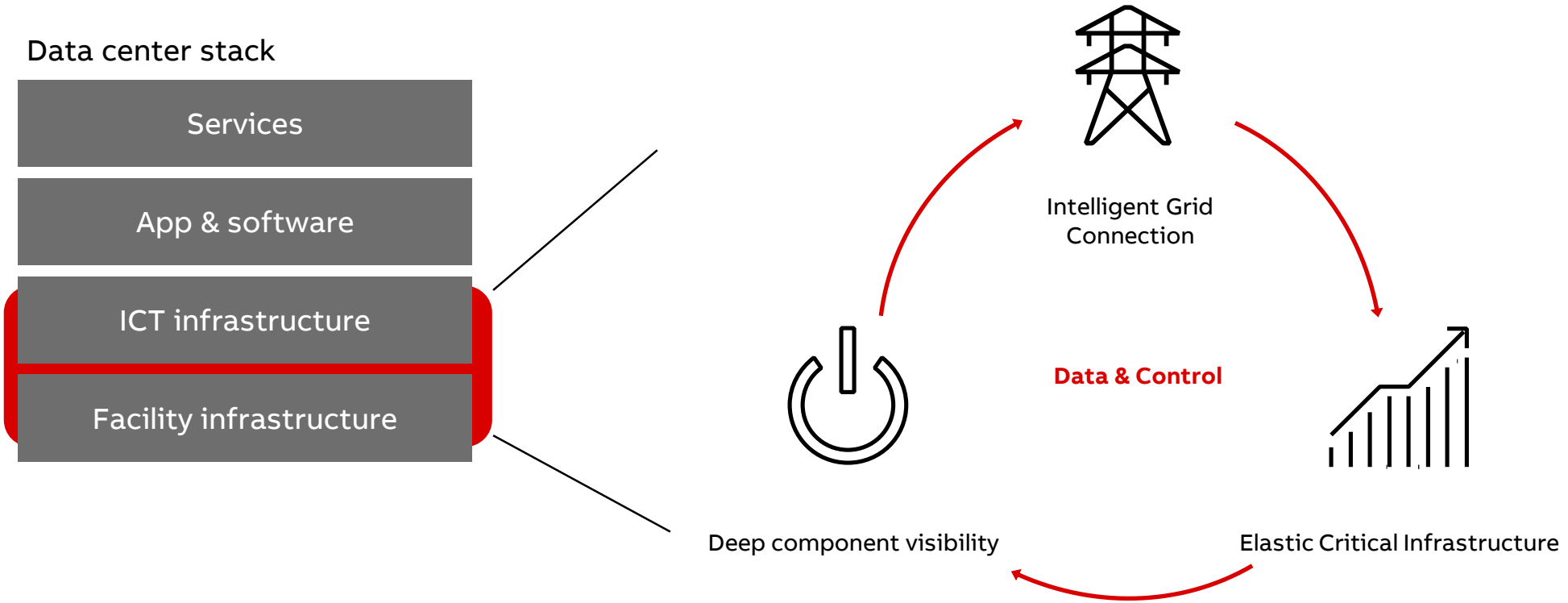
Internet of things, digital control and data

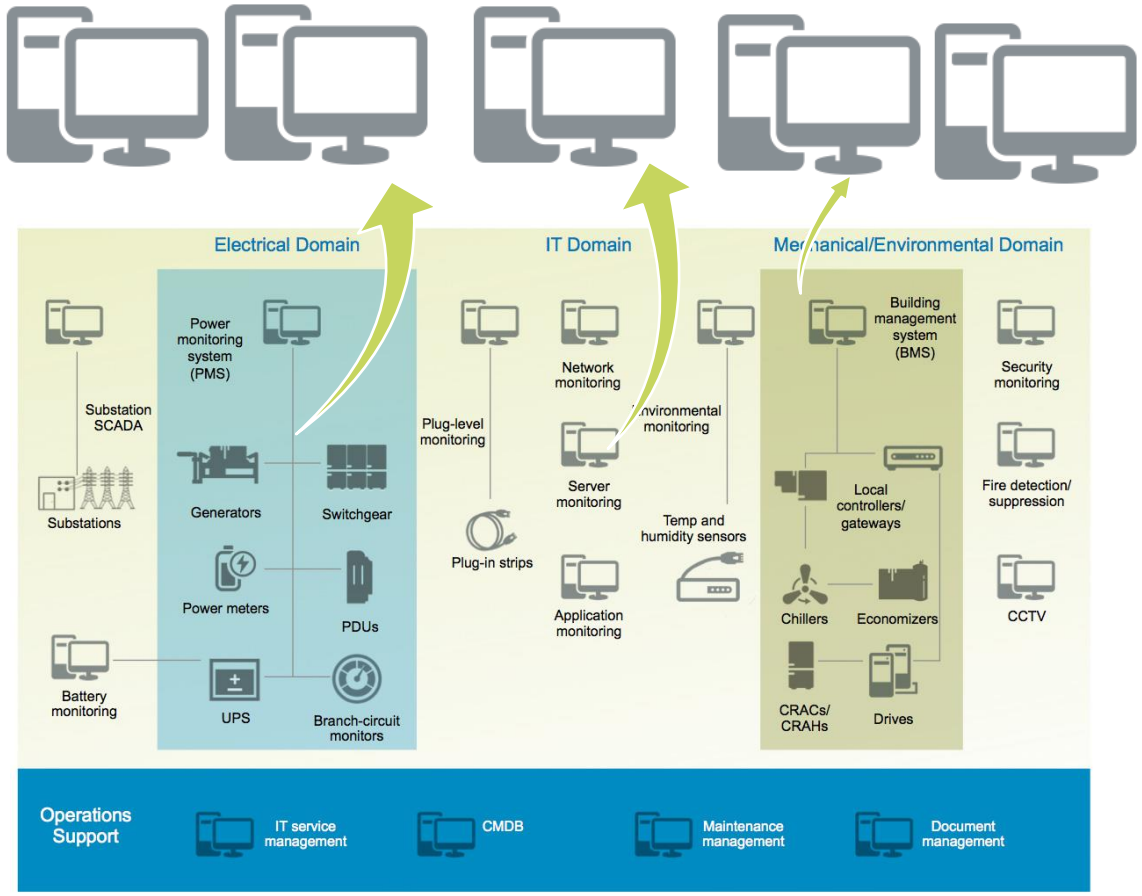
Intelligent data needs intelligent power



Data Center Automation today

DCIM solutions, market still evolving not as mature as other industries

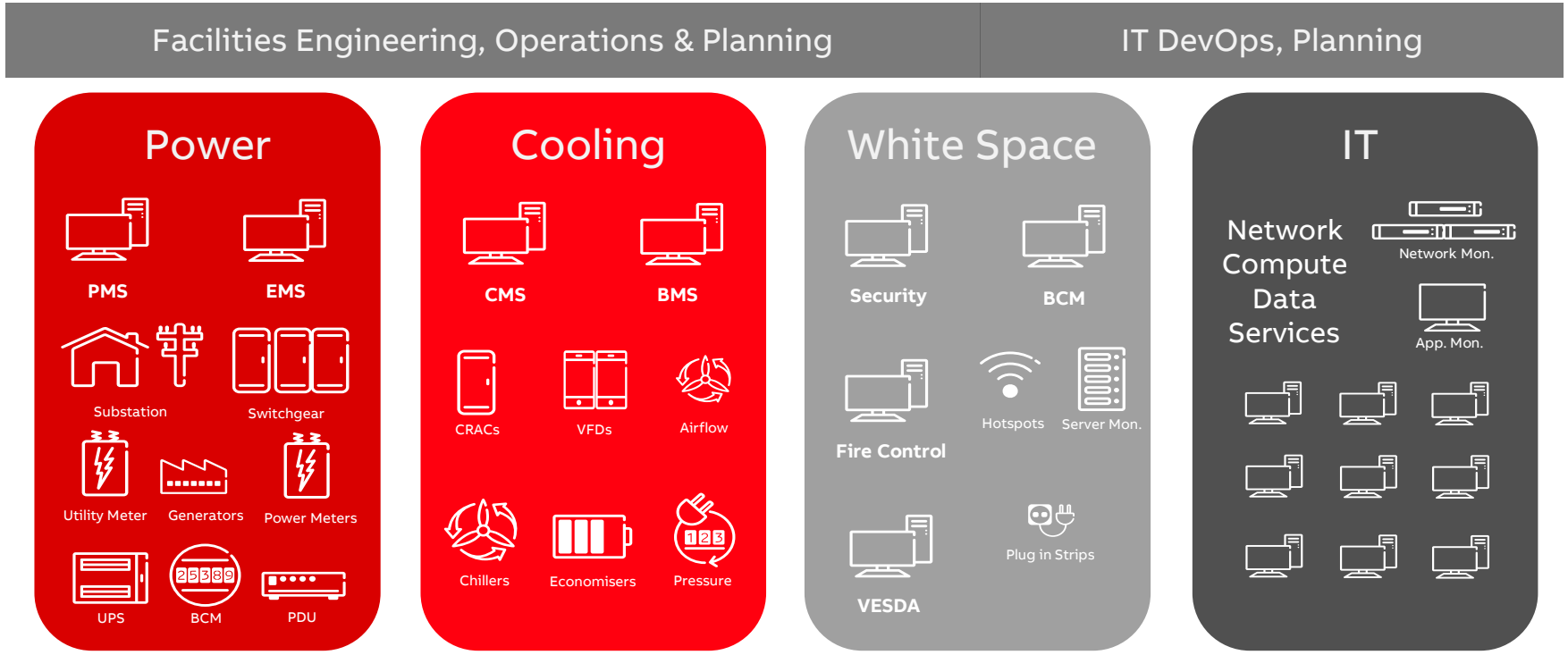
- Still many management systems to view and maintain
- Poor or no integrations, limitations of control
- Difficult to optimize and understand the true state of your data center.



Data Center systems are needlessly complex

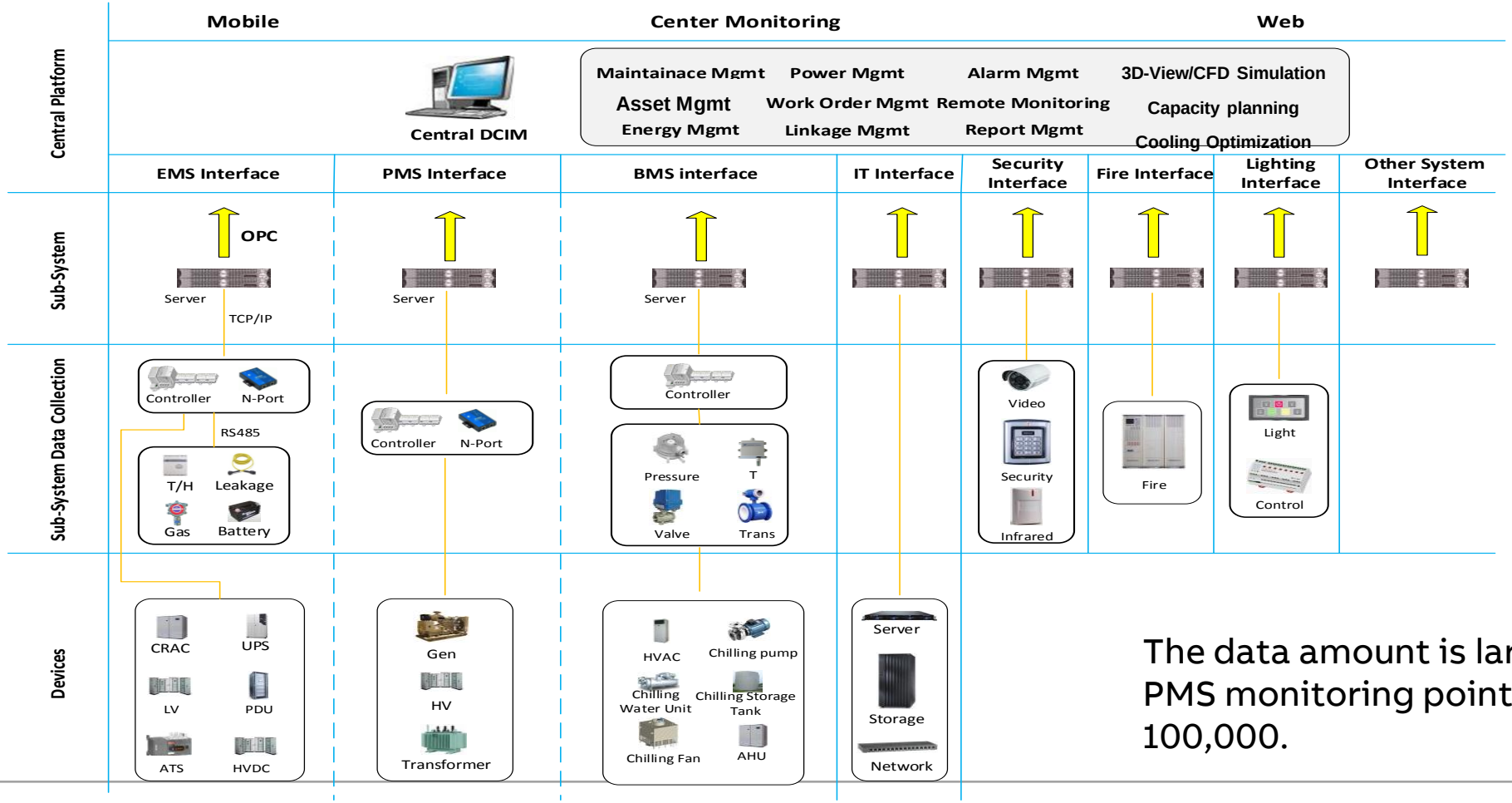
‘islands of automation’ increase risk, cost, inefficiency

- Silos of data and information- no real time dependency modelling
- Difficult to understand, manual integration, human error factors
- Lacking efficiency strategies to model & execute



Data Center common functionality

DCIM needs to be open to handle functions from different vendors

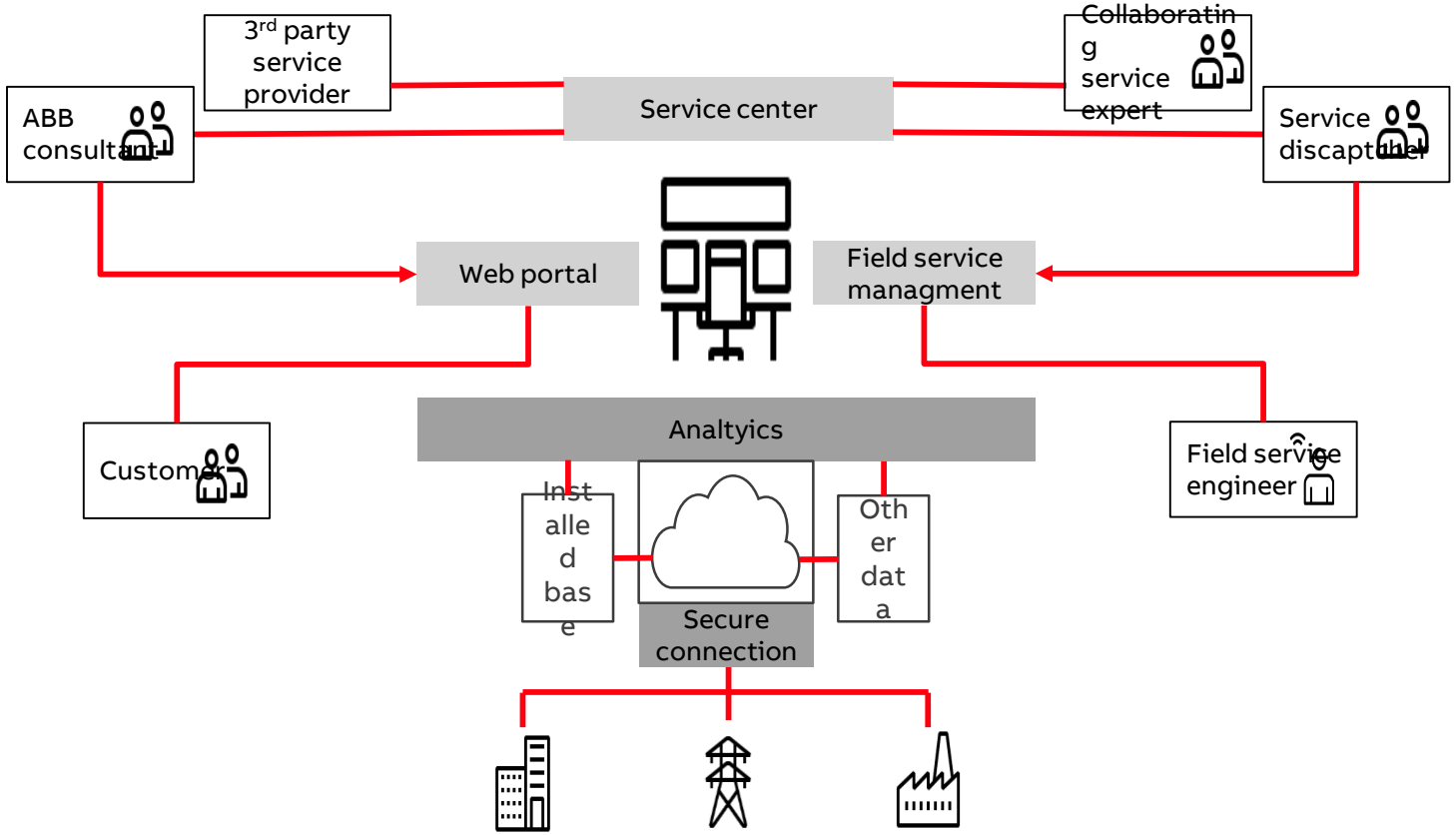


The data amount is large, some times only PMS monitoring points can beyond 100,000.

ABB Ability Data Center Automation

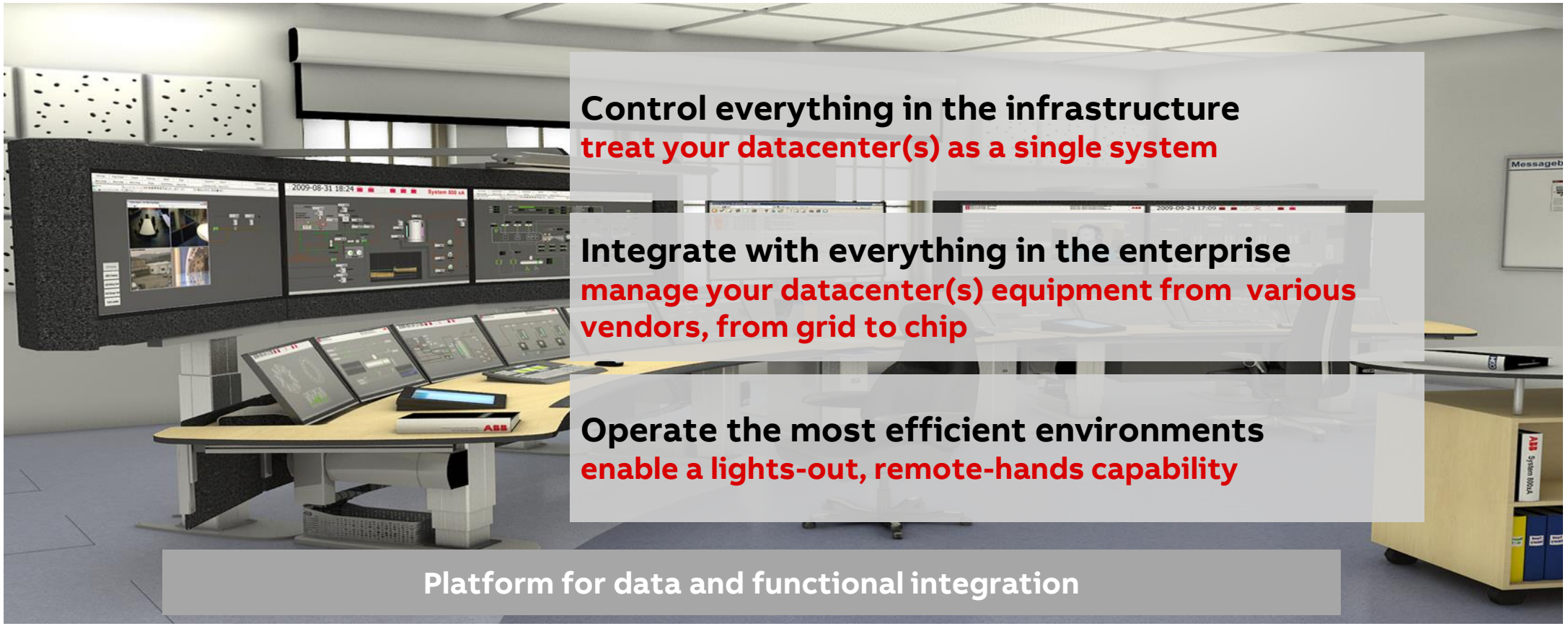
Single integrated system, open architecture

- Supports maximum connectivity and optimization through:
  - Standardized integrations and communication to most protocols e.g. Modbus, BACNet, Profibus, IEC61850, SNMP,…
  - Common user interface
  - High-availability designs, Redundancy
- Fewer systems to commission means faster startups.
- Fewer systems means less cost



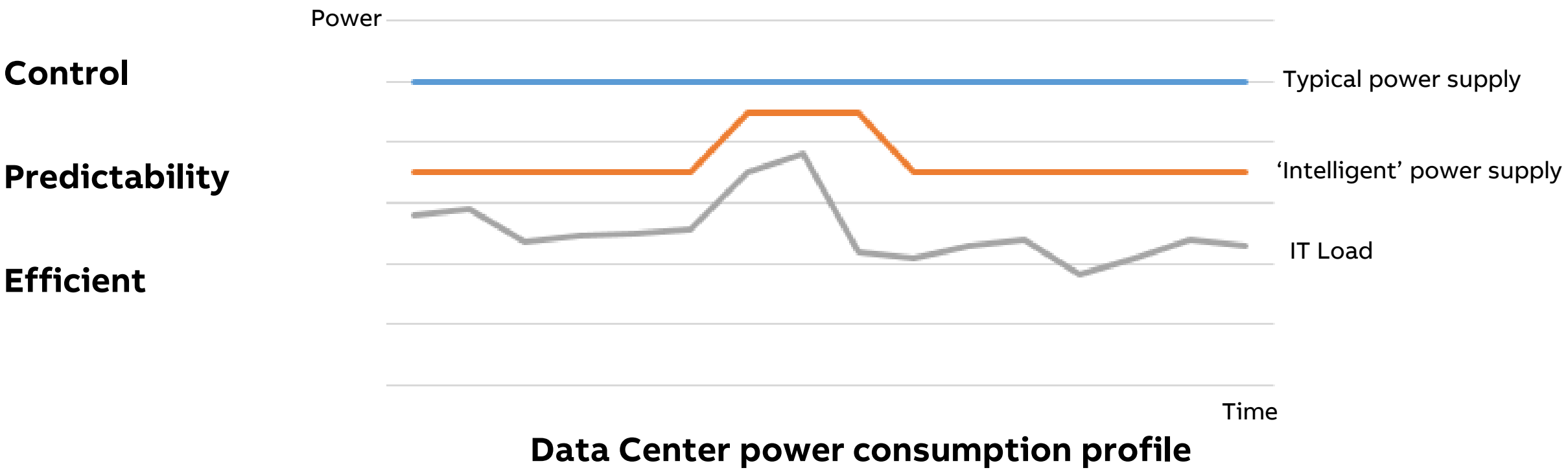
Control + Integrate + Operate

Across all Data Center infrastructure



Industry 4.0 – the Data Center of the future

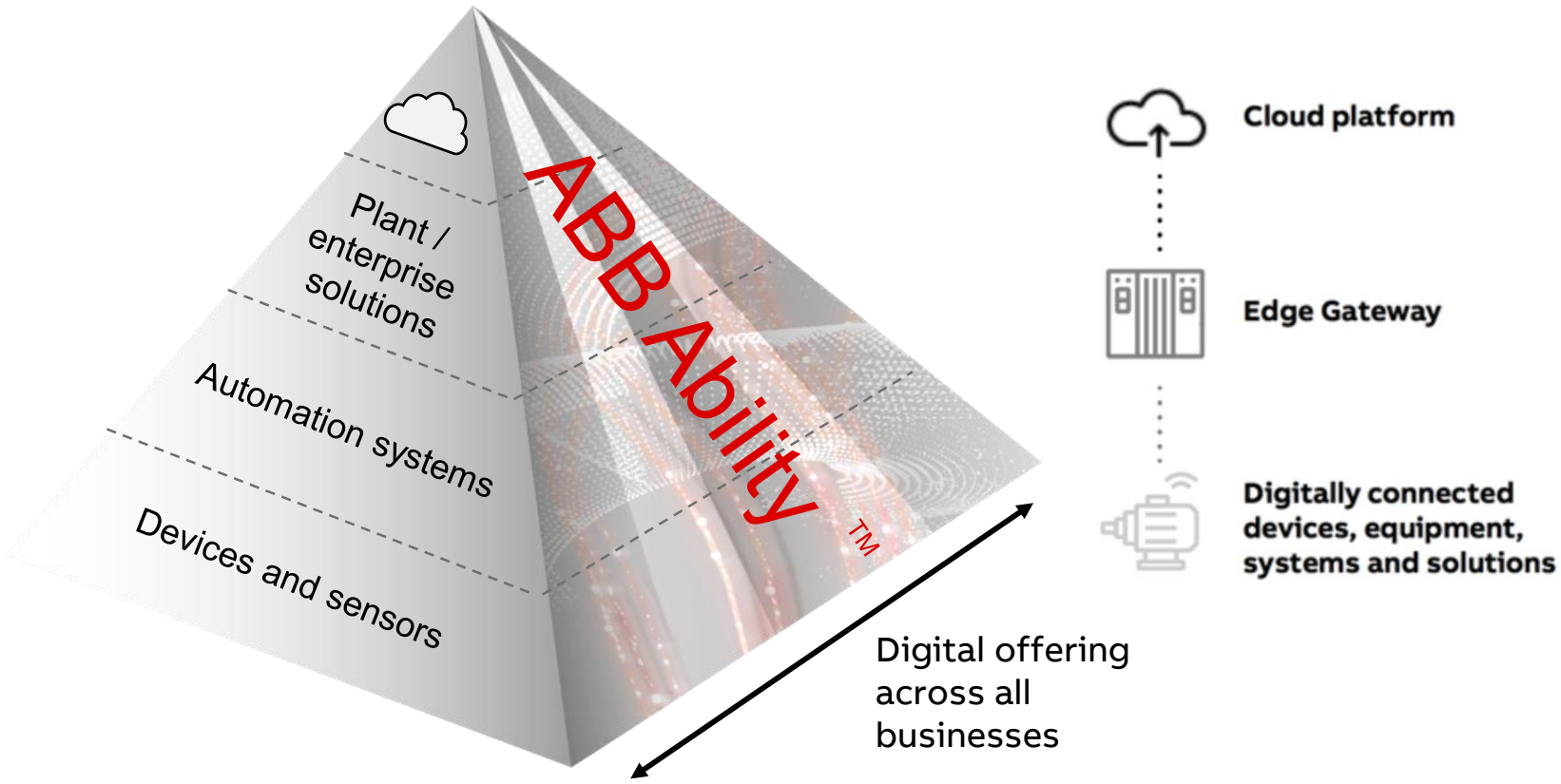
Intelligent data needs intelligent power



Data Center power consumption profile

Unlocking the ABB potential in digital

creating one common offering for digital end-to-end solutions



- Know more, do better
- Expertise at each life cycle stage
- Technology leadership
- Deep sector knowledge
- Decades of experience in digital
- End to end and closed loop solutions
- World's largest installed base of connected industrial devices

Characteristics of the industrialized data center

