Smarter Buildings & Management of Buildings

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Agenda

- IBM's Smarter Planet Agenda
- Smarter Buildings
  - What are Smarter Buildings ?
  - Smarter Building Dimensions
  - Intelligent Building Management
- Smarter Management of Buildings
  - Intelligent Operations Centres
  - ICT Planning & Strategy
- Solar-powered Data Centres

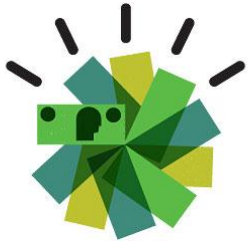
Green Buildings

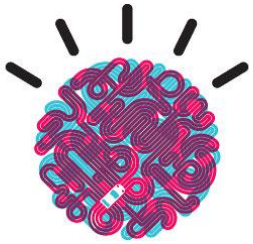
- Policies
- Design & Materials
- Processes
- Technologies

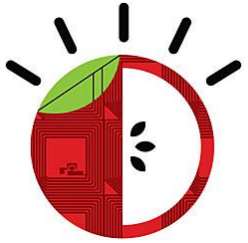
Technology is a key component of an integrated approach to Green Buildings

IBM and partners are working across the industries making our planet smarter

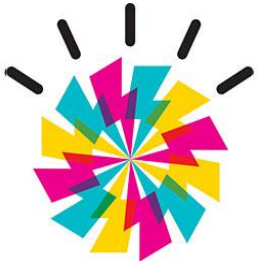

Smarter Healthcare


Smarter Banking

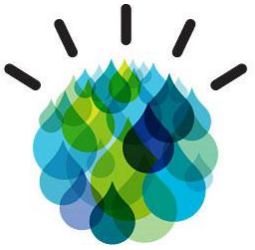

Smarter Traffic

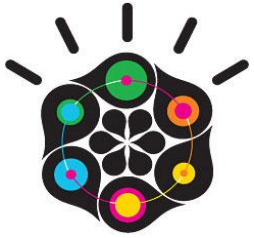

Smarter Food

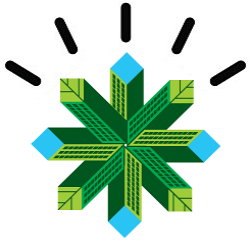
Smarter Retail


Smarter Grids

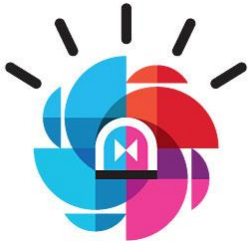

Smarter Communications


Smarter Water


Smarter Oil & Gas


Smarter Buildings


Smarter Townships & Cities


Smarter Public Safety

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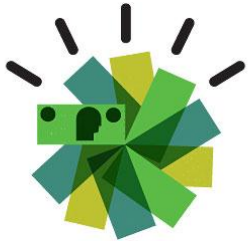
Smarter Healthcare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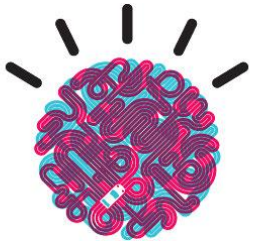
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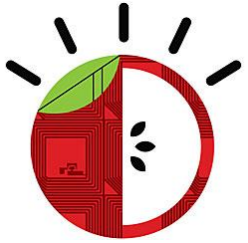
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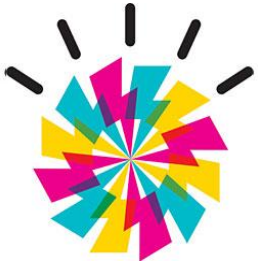
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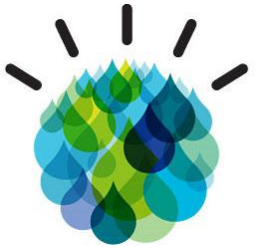
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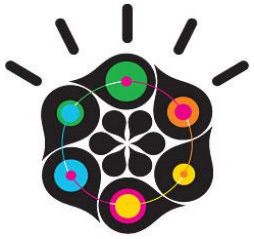
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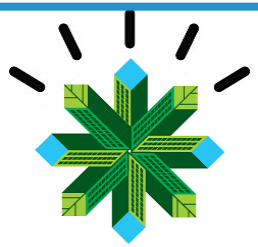
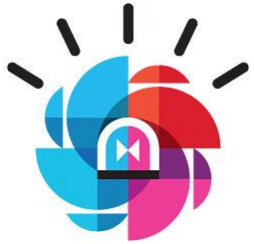

Smarter Buildings


Smarter Townships


Smarter Public Safety

How does a building operate today?

Portfolio
Estates Mgmt

Asset Mgmt
Lifecycle

Energy Use
Passive/Active

Building Services
Maintenance

Occupancy
Space Mgmt

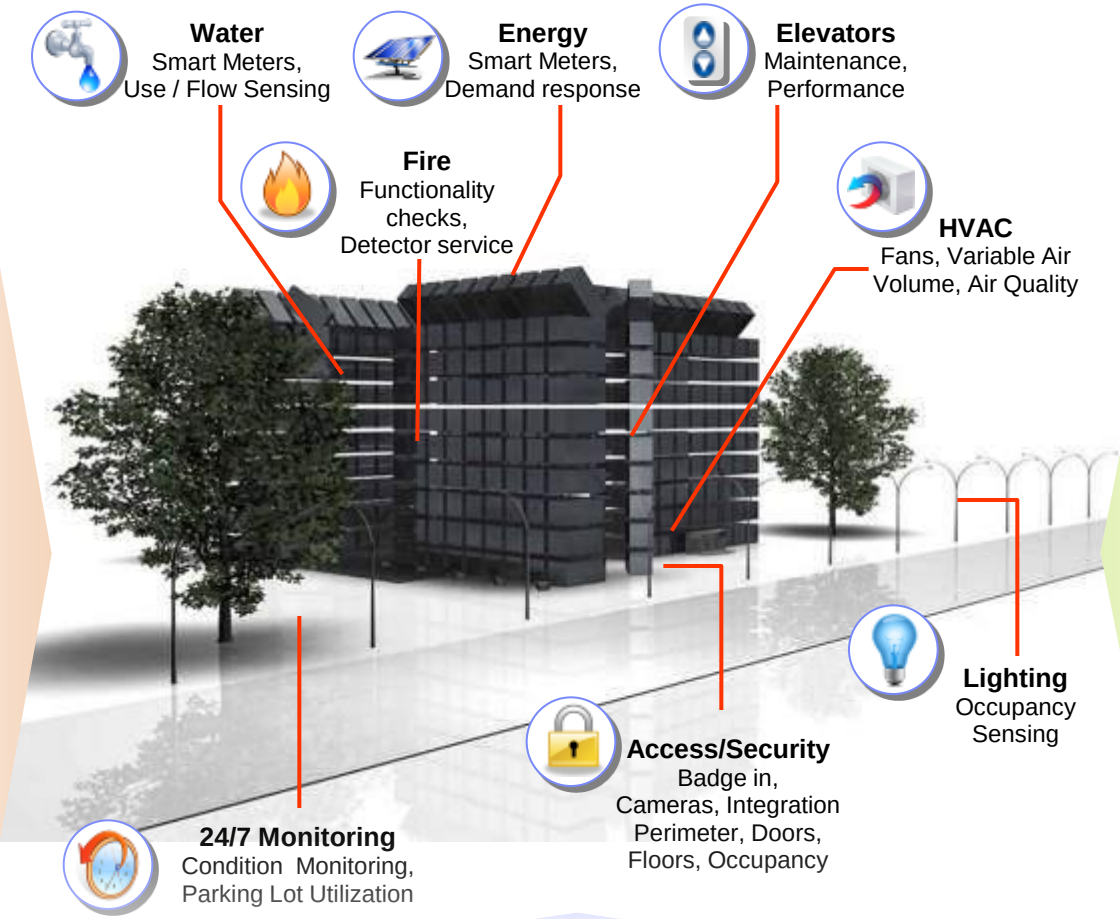
Tenant Services
Help Desk

Waste Mgmt
Trash/Water/Recycle

Compliance
Environmental reports

Industry Specific
Hospital, hotel, etc.

Facilities Management Processes



Building Systems

Building & Communications Services

Interaction with Externalities

Weather
Current
Predictions

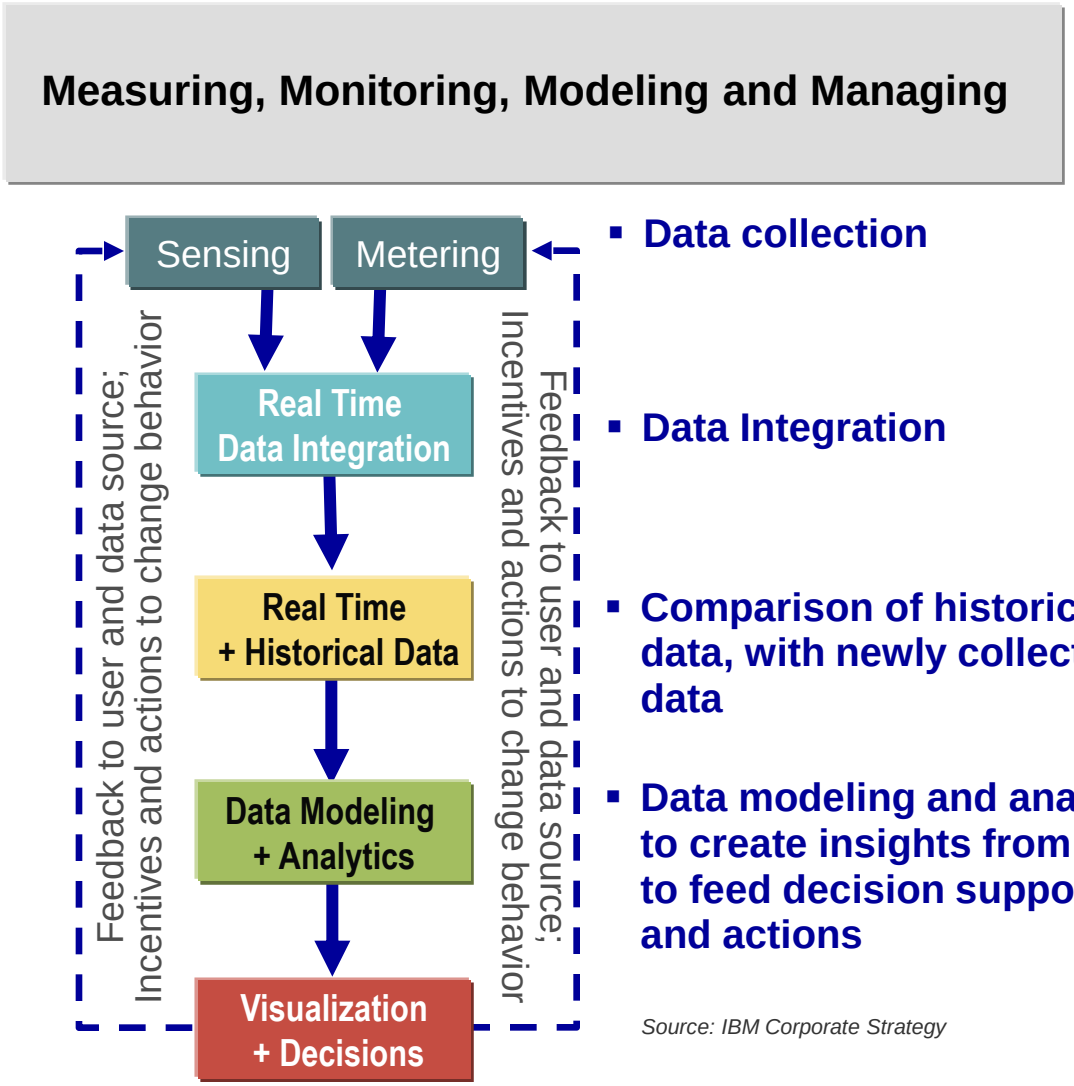
Emergency Services
Alerts, Actions

Utilities
Demand Mgmt,
Cost Control

Community Services
Transportation,
Traffic, Events

Commercial Potential
Advertisement

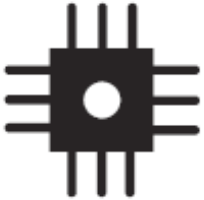
What does it mean to become Smarter?



- **Data collection**
- **Data Integration**
- **Comparison of historical data, with newly collected data**
- **Data modeling and analytics to create insights from data to feed decision support and actions**

Source: IBM Corporate Strategy

What Makes a Building Smarter?



- **Instrumentation**
  - Smart Meters - electricity, water, gas
  - Building Management Systems and Building sensors - lighting, fire, environment, CO2
  - Public safety and surveillance systems
  - IP-enabled devices - servers, PCs, multifunctional devices, actuators, control devices
- **Interconnection**
  - Networked environments – fiber, wireless, public spaces, offices
  - Networked sensors, sensor platforms, concentrators
  - Networked meters and building management systems
  - Taxonomies for integration within buildings and across buildings at an enterprise level
  - Interconnected systems - costs, space-use, portfolio management, facilities management
- **Intelligence**
  - “Enterprise-view” visibility of the building/campus/enterprise/city operations
  - Smarter decisions to reduce operations costs, especially energy & water usage and emissions
  - Optimization and integration of assets, resources, work, safety, environmental systems
  - Real-time analytics of sensor & meter data to optimize operational performance
  - Behavioral modeling of physical, natural, and people systems
  - Visualization for user awareness and action
  - Machine to machine optimization systems

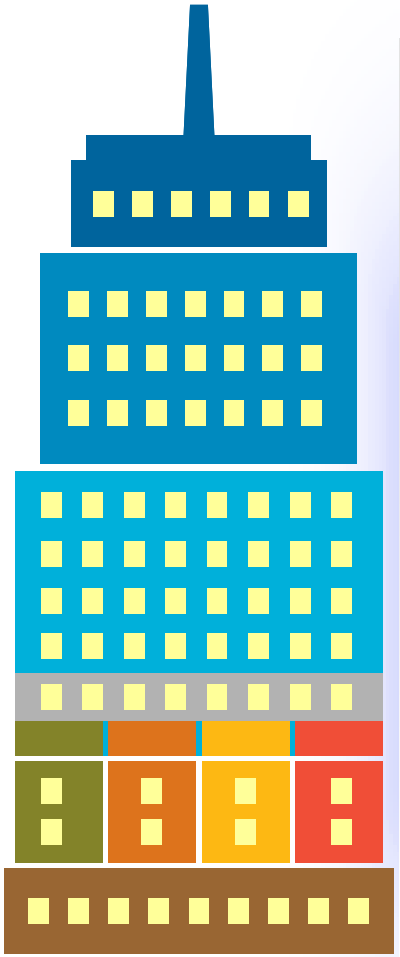
Smarter Building - Potential Business Benefits

Smarter

Intelligent

Inter-connected

Instrumented



Physical buildings and assets

- Identify/exploit strategic property opportunities.
- Avoid costly property holdings

➡ ***Strategic savings***

- Drive space utilisation using technology
- Improve comfort and employee efficiency
- Automate corporate environmental reporting

➡ ***10%-20% savings***

- Energy and carbon monitoring & management

➡ ***10%-30% savings***

- Asset Management
- Reduce redundant assets
- Improve projects for efficiency
- Optimise maintenance activity
- Lower building operation costs
- Streamline operational processes
- Share services and data across the portfolio

➡ ***10%-20% savings***

- Collection of building control information
- Lower risk of significant failures

➡ ***Vital enabling measurement***

- Building operations stable safe and secure
- Physical & logical security and control

➡ ***Less downtime***

Best practices and functions reduce cost and improve operations

Smarter Building Solutions

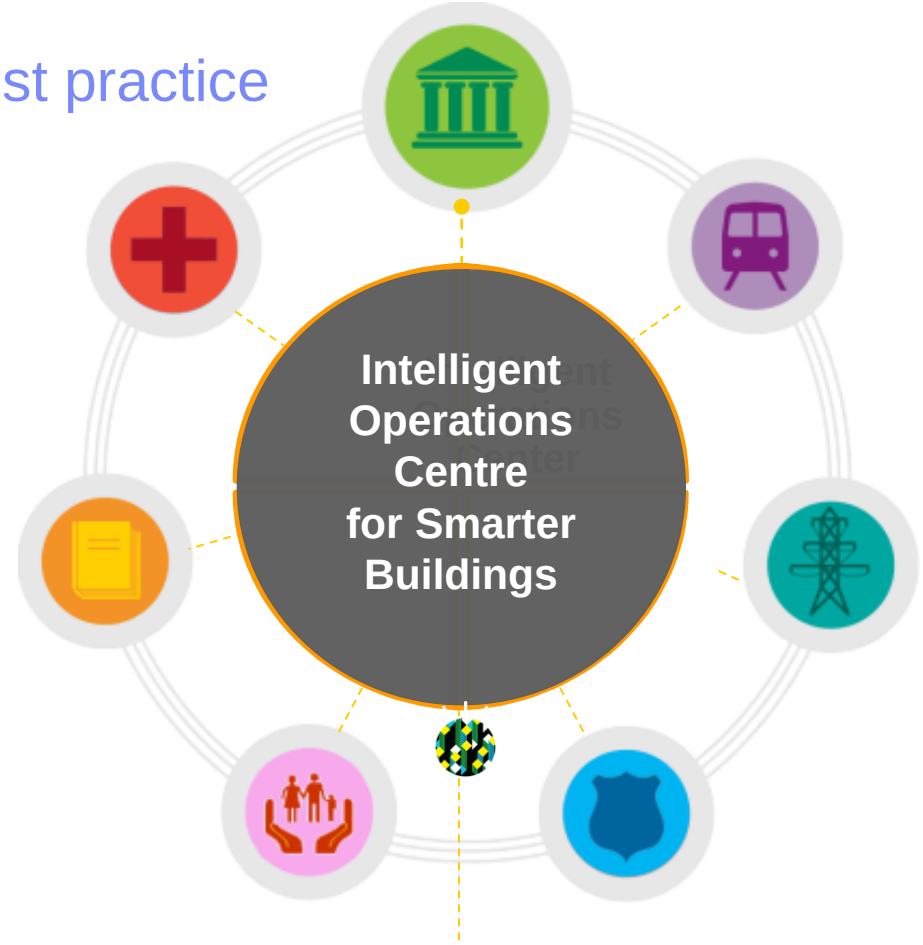
Service Management	Datacenter Infrastructure Management	Space & Facilities Management	Operations Management	Energy and Environment Sustainability	Capital Project Management	Real Estate Portfolio Management
• Facilities service desk • Service level agreements • Contracted services • Customer billing	• Space, power and cooling optimization • Allocation planning • Move, Add, Change • Cable management	• Space utilization • Capacity planning • Move, add, change • Reservations • CAD Integration	• Asset mgmt • Work mgmt • Inventory mgmt • Supply chain • Contracts • Key mgmt • Real Time Condition Monitoring and Alerting	• Utility tracking • Environmental opportunity analysis • Carbon output measurement • Reporting • Real-Time Monitoring • Energy Analytics • Pre-packaged BMS interfaces	• Condition assessment • Capital planning • Budgeting • Construction estimates • Project mgmt	• Strategic RE portfolio planning • Budgeting & forecasting RE expense drivers • Lease & contract admin

ENERGY
OPERATIONS
SPACE

Smarter Management of Buildings

Integrating the most repeatable best practice patterns to :

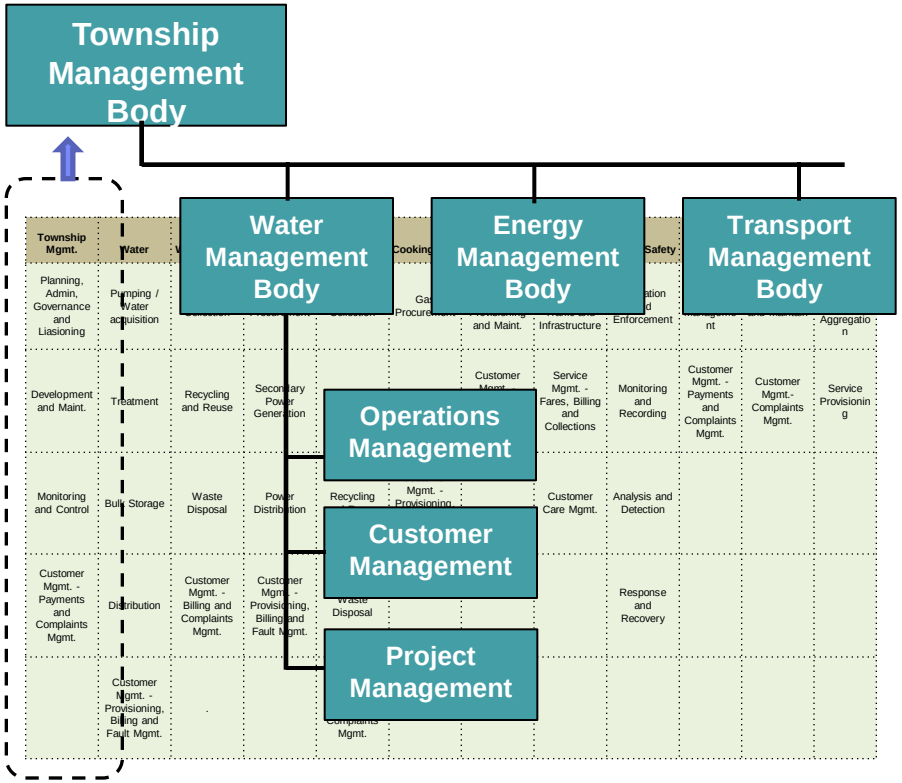
- **Leverage information** across all buildings
  - co-located buildings or
  - geographically separated
- **Anticipate problems** and minimize the impact of disruptions
- **Coordinate resources** to respond to issues rapidly and effectively



Smarter Management of the Township / SEZ

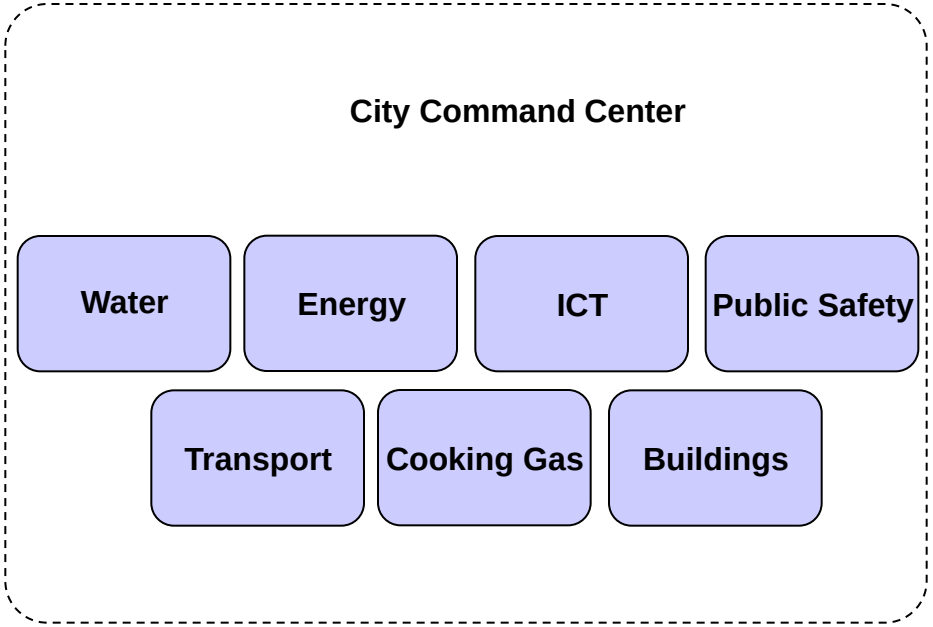
Can be facilitated through an Intelligent Operations centre

- Township Management Body can **own and control** the **assets and services** provided to the residents and commercial establishments
- It may liaison with various O&M bodies to extend the services to the residents / commercial establishments



Asset, Operations, Billing and Customer Management would be done for each of the services offered

- The Township Management Body will be supported through a consolidated **City Command Center**
- The City Command Center will have multiple **sub-command centers** within itself



- The sub-command centers would act as the control centers for the operations within that functional area

Harnessing Solar Power in Buildings - SOLAR powered data centre

- IBM has recently built the 1st Solar-powered Data Centre in India

- IBM uses a new IBM research asset called Measurement & Management Technology (MMT) to optimize the energy efficiency of data centers through the use of Solar Energy
  - Detailed thermal maps of data center across the heights (vertically) is done
  - Metrics based output are used to identity identify temperature hotspots, airflow leakages and under utilized areas
  - return on investment study for deploying photovoltaic arrays is done (PV)
  - Installation of , which will supply power to the data center IT equipment during the day time

- MMT has helped in achieving estimated upto 26% of savings in datacenter energy cost for 10 datacenters in India.

In Summary ……

- Smarter Buildings / Data centres with improved energy efficiency are a reality today
- They contribute to improved efficiencies & lower operating costs in the long term
- Analytics provide valuable information for improved decision making
- It is possible to leverage smarter infrastructure in a remote manner, including the ability to manage across locations through common infrastructure

QUESTIONS?

AND THANK YOU!

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