# Integrated approach to Cell Tower infrastructure Management

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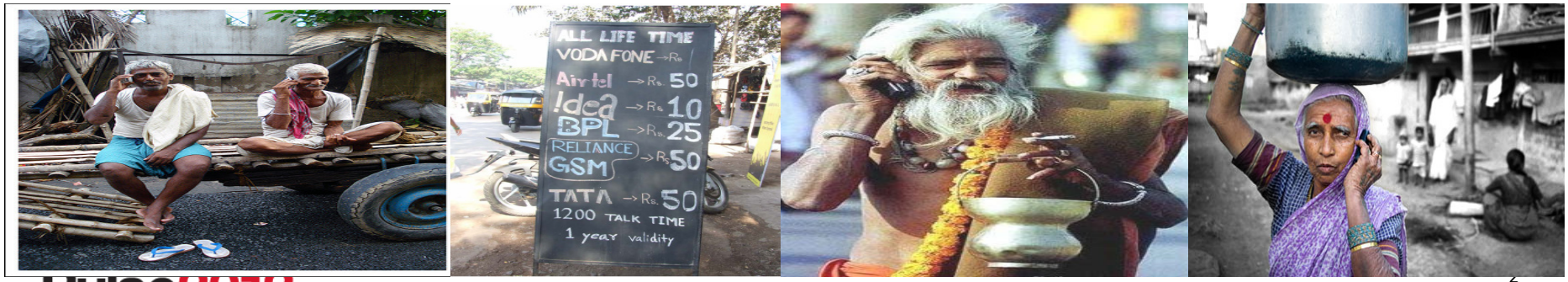
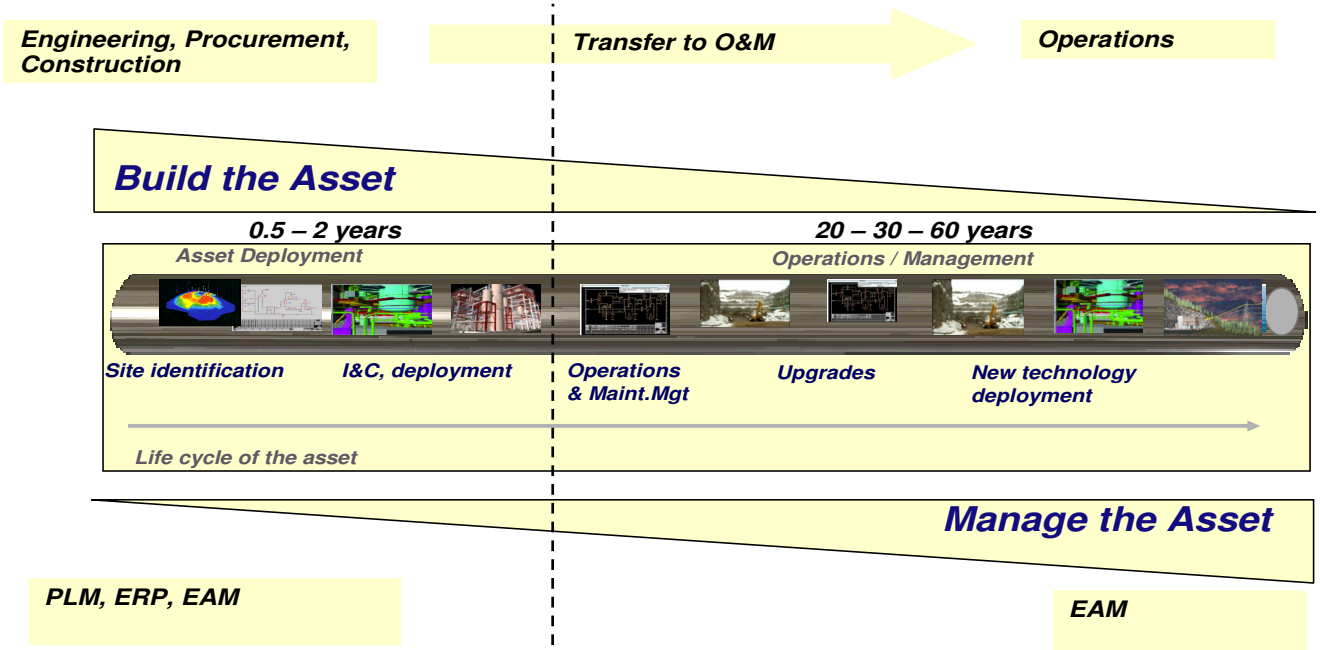
# Telecom Infrastructure : More than just a business …

- Makes communication available and affordable for the masses
- Makes Telecom service providers profitable despite low tariffs
- Bridges the rural-urban divide
- The largest Tower infra operator in India manages 100,000 towers over 200,000 sq km of area, with <4 hours of EB supply in rural areas, and a distributed workforce of 30,000 people

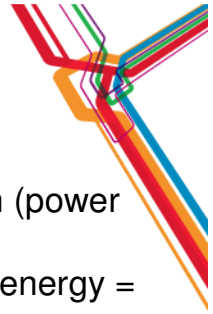


# Overview

- Telecom infrastructure is an asset-intensive business
  - Lifecycle : Asset deployment, followed by provision of ***space, power*** and ***services*** to customers (internal or external ) over many years



# Common Characteristics

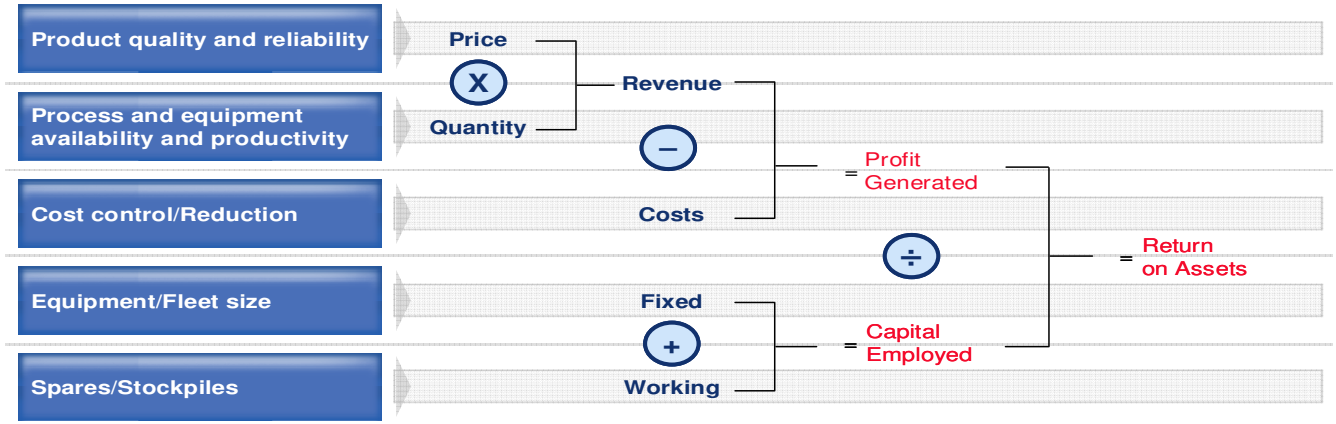


- Capital-intensive “build” phase, followed by long “run” (operate & maintain) phase
  - **Build** : Site Acquisition (ground / roof sites), Planning (Coverage), Procurement and Installation (power and Telecom equipment)
  - **Run** : Maximize tenancy (= asset utilization), Minimize opex to run / maintain sites (manpower, energy = Grid / Battery / Diesel)
  - Business performance is a function of capex and opex productivity
- Tight cash flows require low, predictable opex over a long term
- Large number of distributed assets – require advanced automation for remote management
- Critical dependency of core Business processes on IT
  - Site Acquisition
  - Opportunity to Order
  - Procure to Pay
  - Stock to Build
  - Order to Cash (Billing)
  - Deploy to Retire (Asset Lifecycle, Corrective/Preventive/Predictive Maintenance)
  - Governance, Risk and Compliance

# Key business performance drivers

- Capex productivity
  - Asset Lifetime and performance
  - Tenancy ( if Applicable in future)

- Opex productivity
  - Energy and fuel
  - Labor
  - Spares and inventory

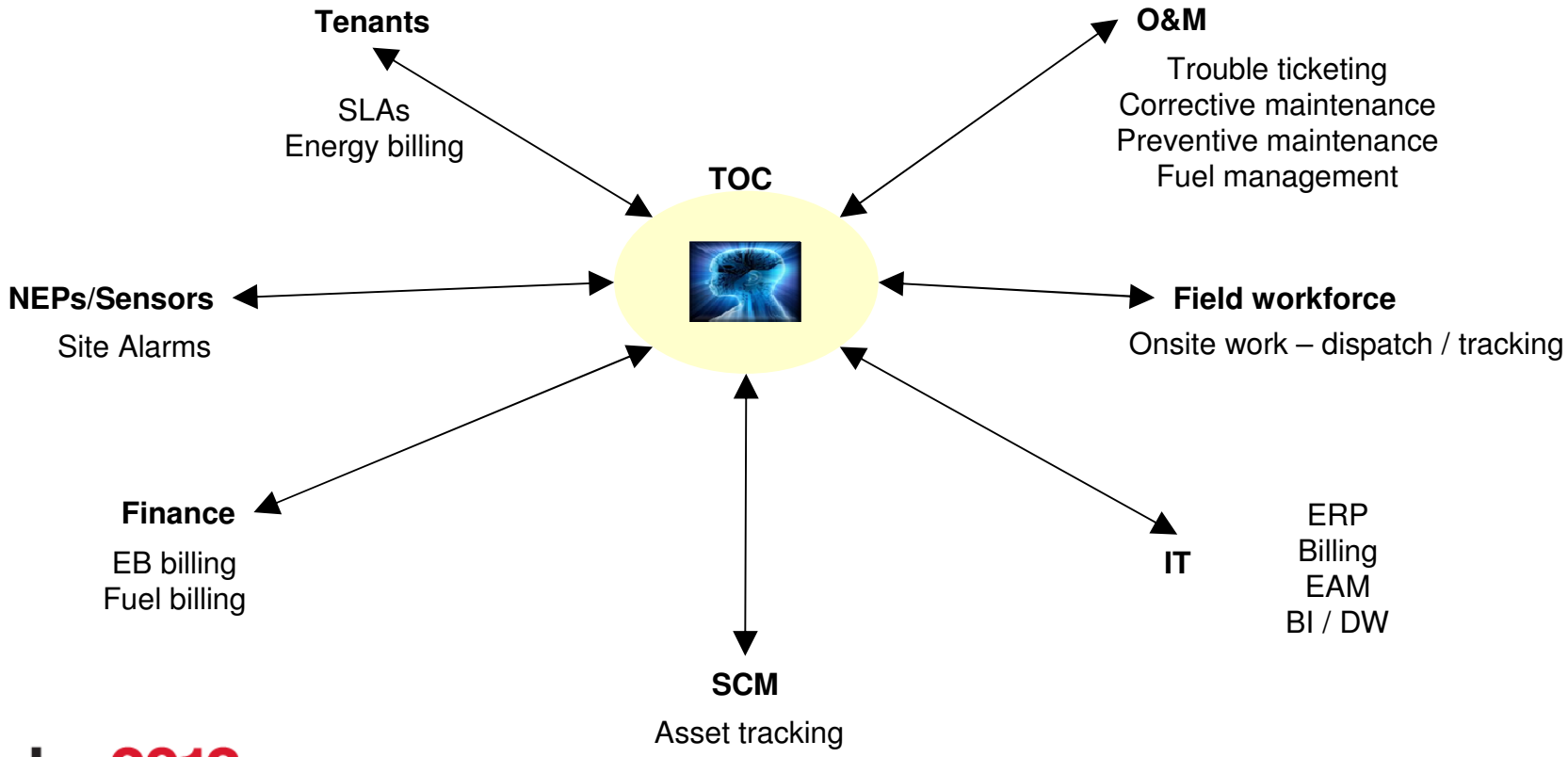


# Tower Management PoV

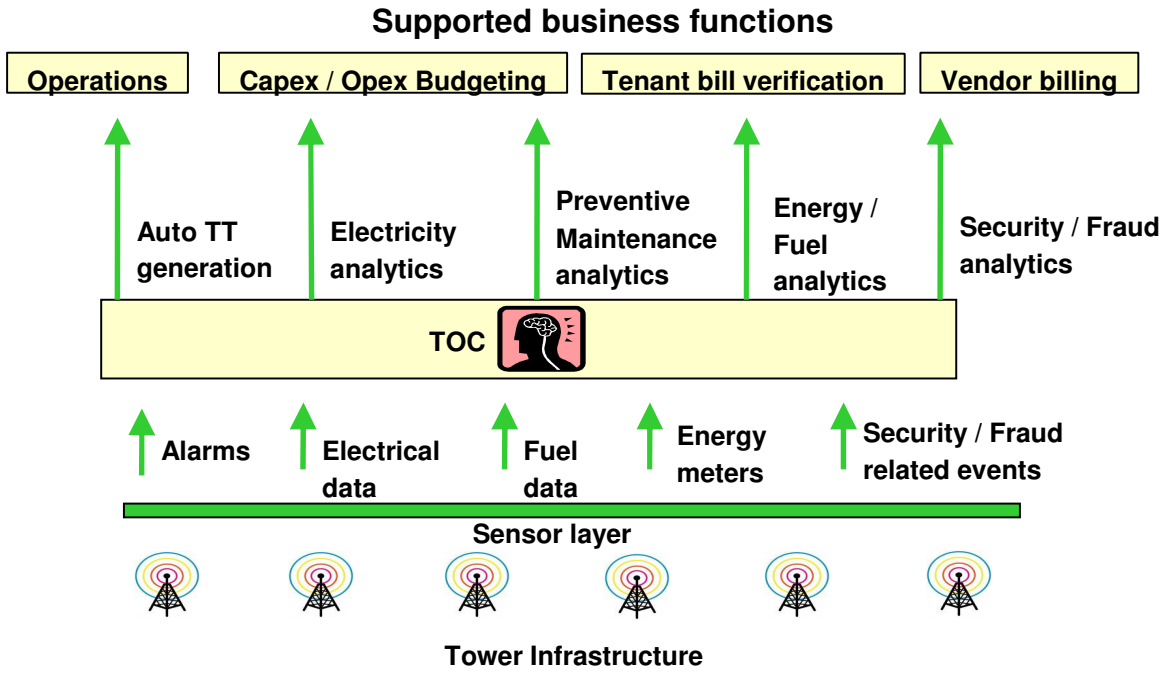
- IBM's tower management solution **explicitly** supports the tower operator's business goals –
  - Empowers the Operator through participation across the entire lifecycle – web-based 24X7 monitoring, reporting, site finding, project tracking, billing, payments
  - Lowers manpower and energy opex – enabling competitive Cell site /Tower operations
  - Proactive / Preventive management – enabling offering of tighter SLAs
  - Centralized management and control over remote assets and workforce

***With significant deployment experience and pre-built assets, IBM is uniquely positioned to deliver value in the shortest timeframe***

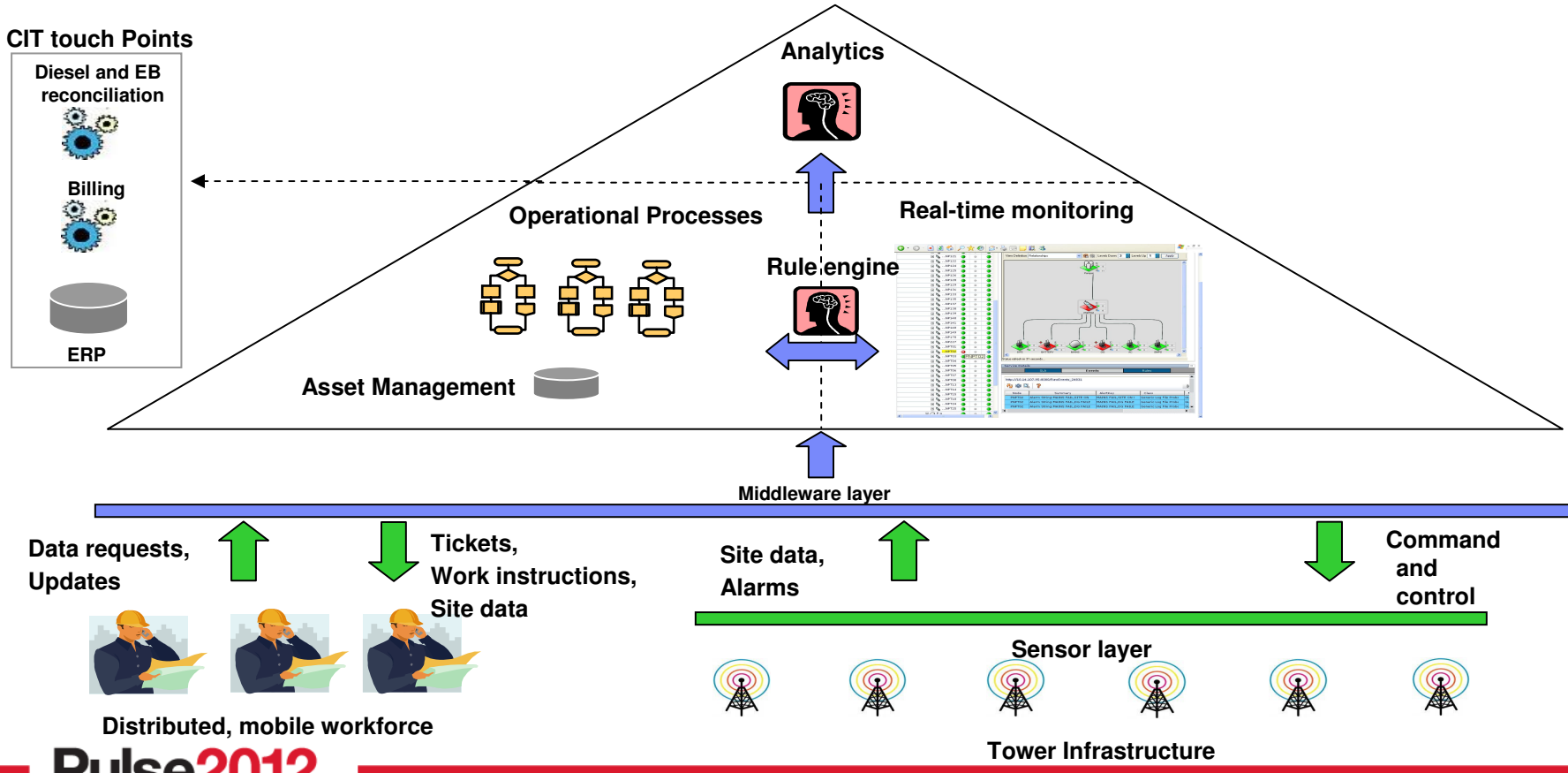
# TOC (Tower Operations Centre) is at the heart of operational transformation



# TOC in the business process ecosystem



# High-level solution architecture



# Large Indian tower operator

- Rolled out in 11 circles, with centralized NOC in Gurgaon. About 12,000 of 30,000 towers instrumented

- Live, multi-modal data acquisition from towers
  - **Sensor data over SMS, GPRS, OSS (Nokia, Ericsson)**
  - ~ 2 million alarms per day

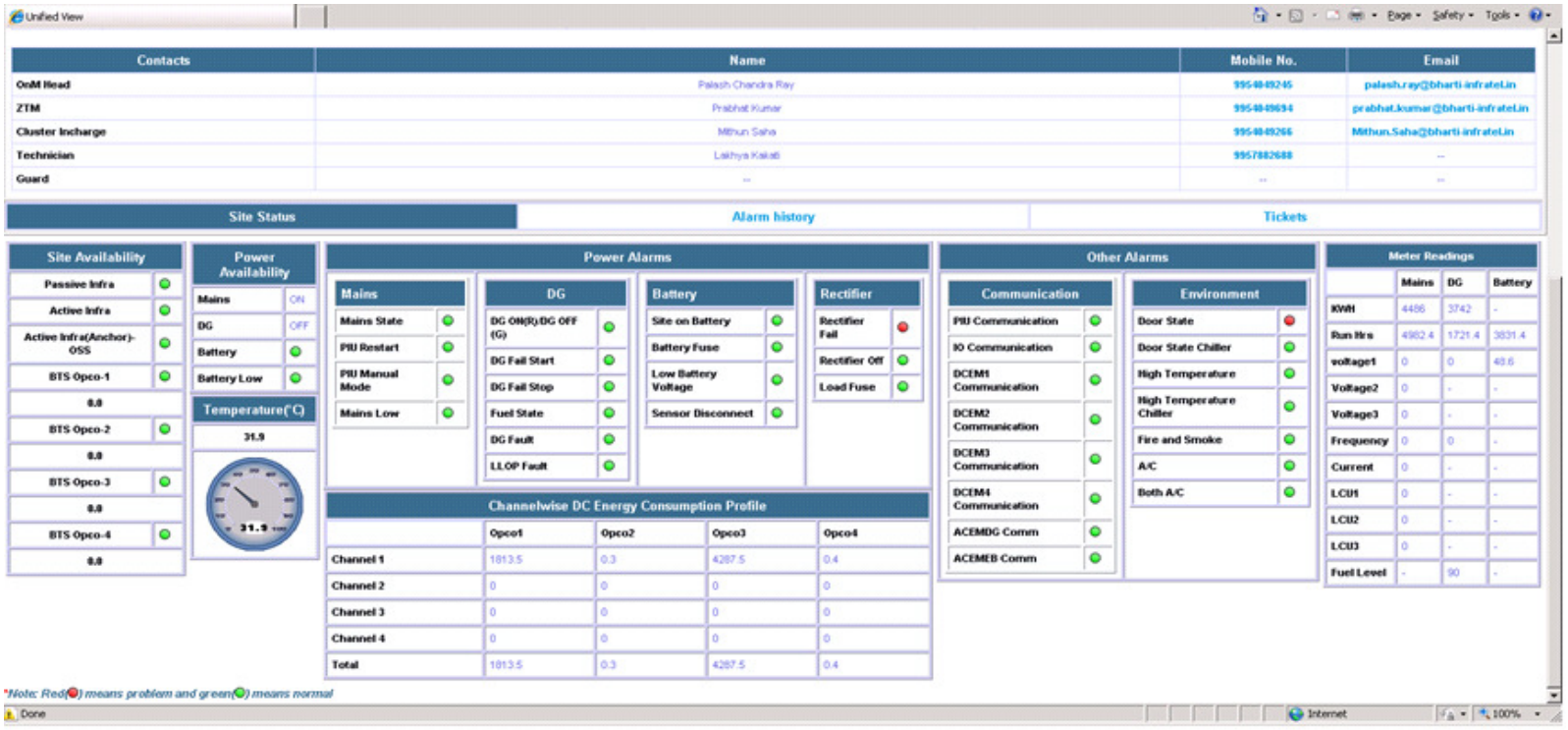
***Massive volume of data, not suitable for manual operations !***
***Requires system intelligence and process automation***

- Rule engine, the "brain" of TOC, converts raw data into actionable intelligence
  - System's rules are effective - only about 6,000 alarms are determined to be actionable
  - About 210,000 tickets are created in a month => Less than a ticket a day at a given site

- Complete infrastructure asset inventory

- OSS and Sensor data drives O&M

# Unified Site Dashboard



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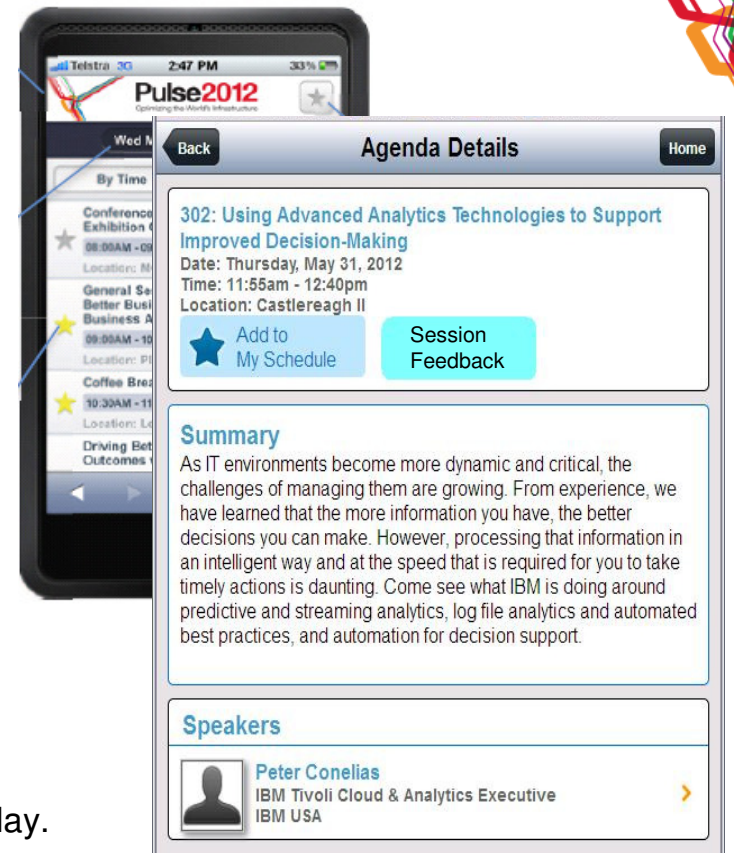


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Approx Cost: $129

Olympus TG-320 Tough Digital Camera Red
Approx Cost: $242


Tivoli model three platinum radio
Approx Cost: $499.00

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