Managing Sugar Complex Anywhere Anytime

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GBL complex

- Sugar Complex with:
  - Crushing capacity:15,000 TPD
  - Power generation:43 MW
  - Distillery: 3,40,000 ltr/day
  - Ethanol: 60,000 ltr/day
  - Biogas: 5,250 Nm^3/hr

- Data acquisition & aggregation:
  - Siemens & Yokogawa DCS
  - 7 PLCs: GE Fanuc, Siemens, Rockwell
  - Multiple instruments: energy & flow meters
  - Electronic weigh-bridge data from ERP
  - Lab data through Web

Complex needs …

- Need for critical manufacturing information anywhere, anytime, any device *(prefered iPad)*
- Need arising out of:
  - GBL complex 500 km from Mumbai Corporate HO
  - CMD's frequent travels within and outside India
- ERP based corporate dashboards:
  - Developed by one of the big four accounting firms
  - Covers Finance & HR KPIs
- Lack of critical manufacturing KPIs
  - Delays due to manual MIS compilation
  - Tough to compile information
  - No readily available solution/supplier
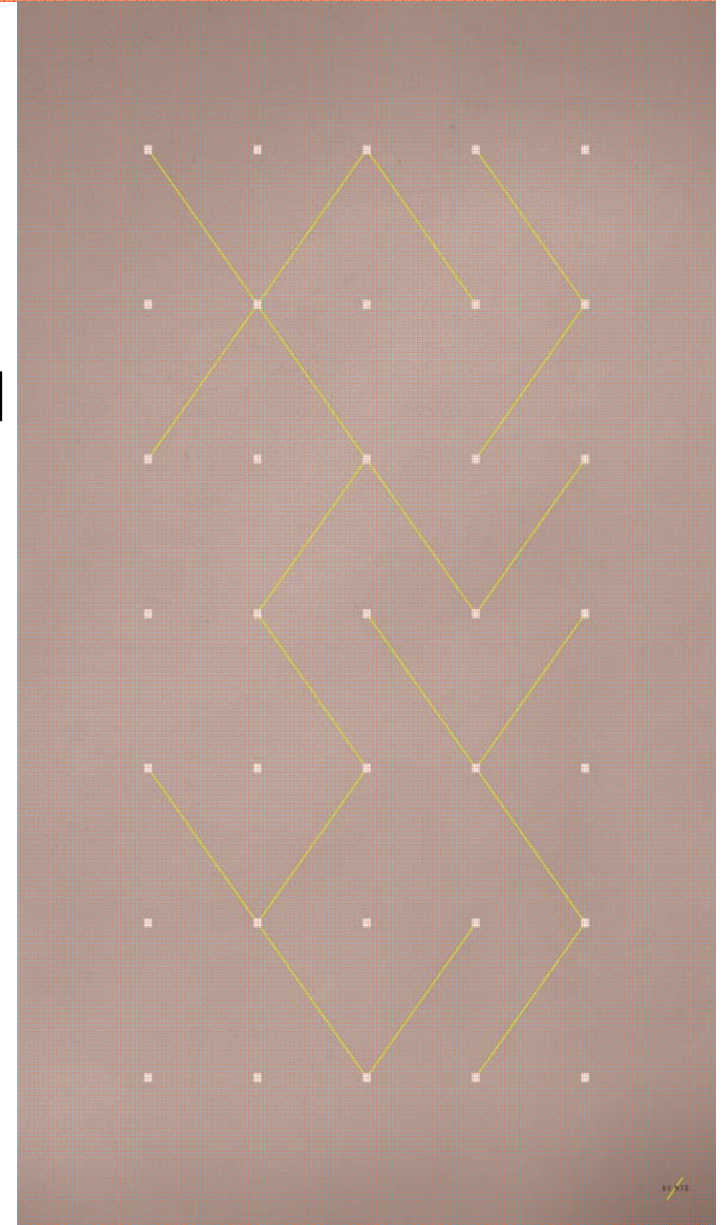
Picking the brains .... Top floor

- Site discussions for process mapping
- Analytics developed for:
  - Production
  - Productivity
  - Availability
- CMD added "loss analysis" post brainstorming by team:
  - Pol % Bagasse, Pol % Molasses, Moisture % Bagasse
- Wireframes used for dashboard visualization:
  - 70 different drill down tables, reports, charts, trends across sugar, distillery, co-gen and biogas plants
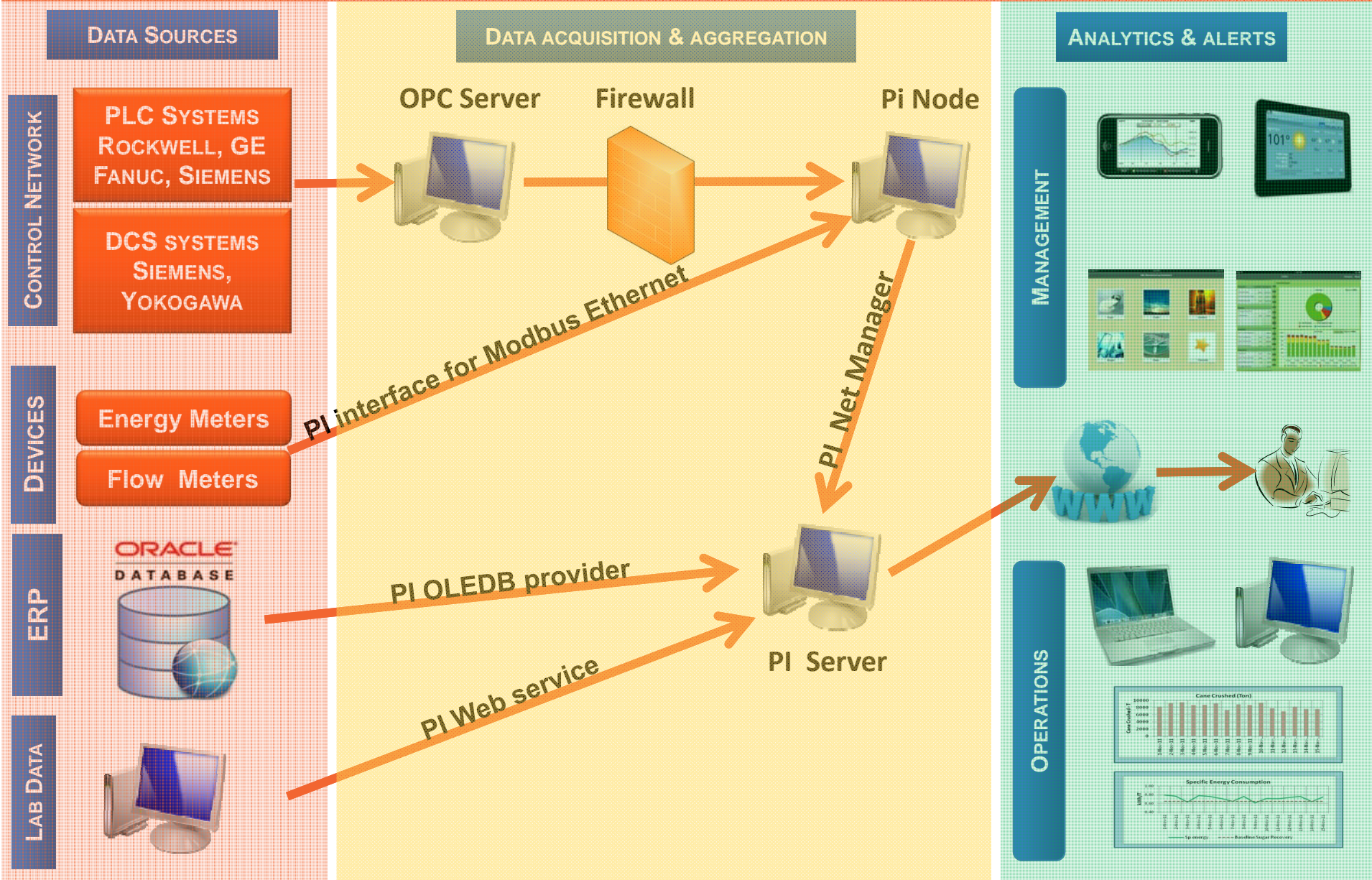
- Solution detailing on shop floor
- Data sources identified & parameter crystallized for analytics
- Additional instrumentation installed
- Data acquisition system and PI connectors firmed up
- Networking backbone created
- Installed server infrastructure: OPC, database, AF
- Security ensured: firewall between control and business network

Weaving the solution…

DATA SOURCES

CONTROL NETWORK
- PLC SYSTEMS ROCKWELL, GE FANUC, SIEMENS
- DCS SYSTEMS SIEMENS, YOKOGAWA

DEVICES
- Energy Meters
- Flow Meters

ERP
- ORACLE DATABASE

LAB DATA

DATA ACQUISITION & AGGREGATION

OPC Server   Firewall   Pi Node

PI interface for Modbus Ethernet

PI Net Manager

PI OLEDB provider

PI Web service

PI Server

ANALYTICS & ALERTS

MANAGEMENT

OPERATIONS

OSIsoft Product & Services employed

- PI Interface for OPC DA
- PI Interface for ModBus Ethernet
- PI ODBC Client
- PI OLEDB Provider
- PI Web services
- PI System Management Tools
- PI ACE (Advanced Computing Engine)

- PI AF
- PI Server
- PI Notifications
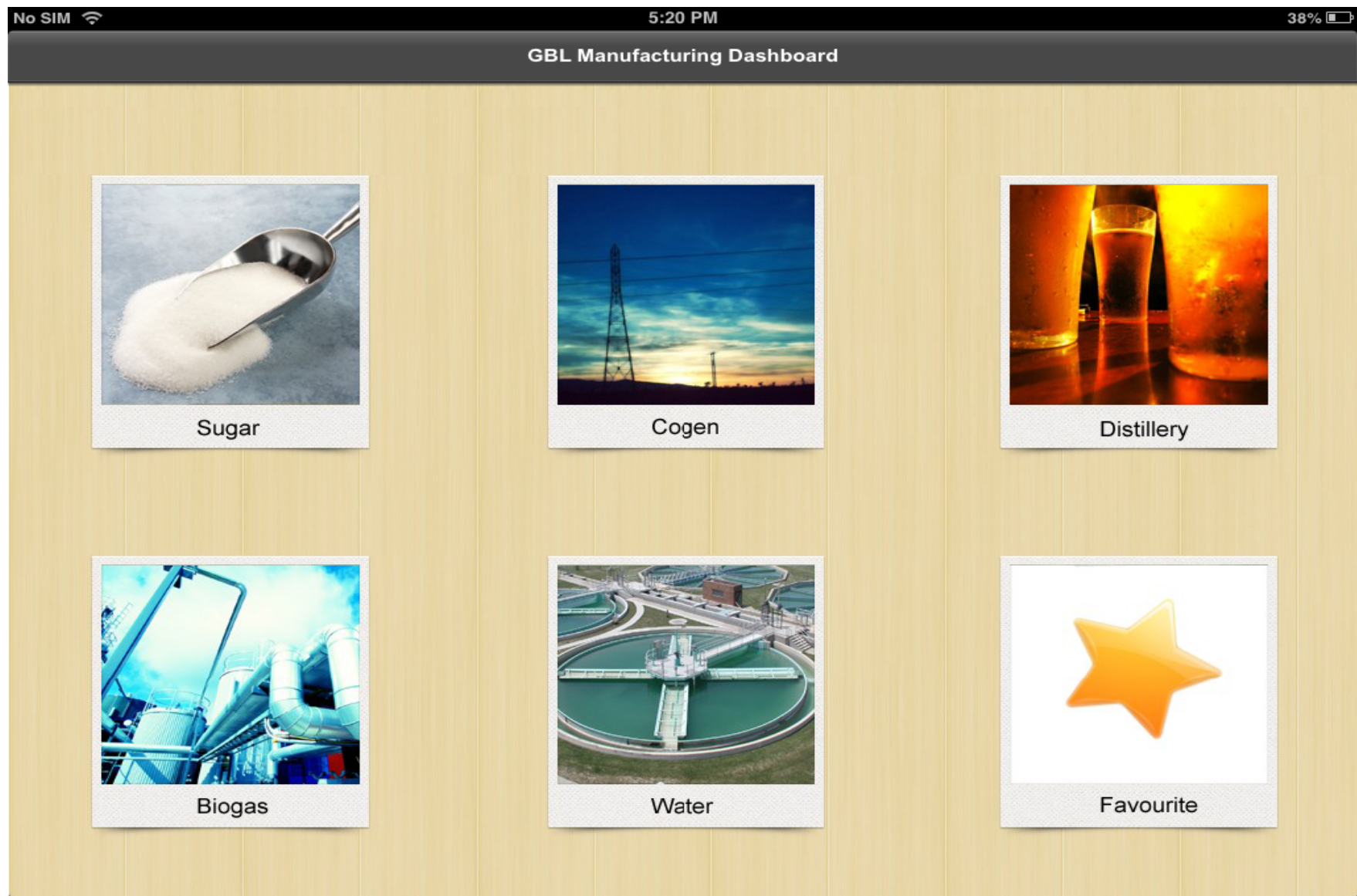- OSIsoft vCampus
- OSIsoft Users Community

Team work

- Roles & Responsibilities:
  - <u>Domain experts</u>: GBL Production, Process and C&I team (process equipment, control system)
  - <u>Enablers:</u> GBL IT hardware & Software team (ERP, connectivity)
  - <u>PI System selection:</u> implementers & developers
  - <u>Implementers:</u> EcoAxis Engineering team (Project management, data acquisition, engineering analysis, installation & commissioning)
  - <u>Developers:</u> EcoAxis Software team (PI System, Application & GUI)
  - <u>Tech Support:</u> OSI Soft regional support team

- "Cross functional, multi-domain" team working was critical for success of the project.
- GBL management was the driving force…

Deadline … deadline…

- Sugar production is a seasonal business…6 months on from Oct to April
- Project initiated in March, with "go-live" & "stay-on" targets by Sept end for 2012-13 season
- This FOAK project had severe time lines
- GBL & EcoAxis team with timely support of OSI technical support team made it possible…just in time!

Delivered !

And the results…

And the results…

And the results…

And the results...

Benefits

REPLACED…	NEW AVATAR
• Reels of Excel data • Data in figures only • Once-in-15-days delivery (except daily production) • Manually prepared by five operatives • Scattered-form data • Long cycle: Receipt-analysis-action • Limited data access: frequent travels for plant reviews	• Multi-layer drilled data • Charts & trends • Data just with a touch of icon, on-line, anytime • M2M technology based analytics (nil manpower) • Season-on season trends • Instant delivery and action with screen snap-shot email • Anytime, anywhere - with reduced travels to site

Future plans

- With basic infrastructure in place, more projects on the way:
  - Water recycle plant dashboard
  - Energy Management System (EMS) with 45 energy meters
  - Operations dashboards
  - Acetic acid plant monitoring

Connect shop floor to top floor

"*In a typical multi plant operations setup, controlling losses and ensuring increased productivity is possible for top management only if manufacturing information is available anytime anywhere*"

Mr. Samir Somaiya ,CMD

Business Challenge	Solution	Results & Benefits
• Lack of critical manufacturing KPIs to control cost, reduce losses, reduce energy consumption. • Extensive travelling by CMD required monitoring of operations anytime, anywhere	• Data was acquired from disparate data sources spread over large geography, using various PI connectors. • Then aggregated and processed in real time on PI server. • Thereafter converted into meaningful analytics	• With touch of an icon, instant multi-layer drilled data is available with charts & trends, giving better control on operations, anytime anywhere, requiring limited travel to site & no human assistance.

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