

Schnitzer

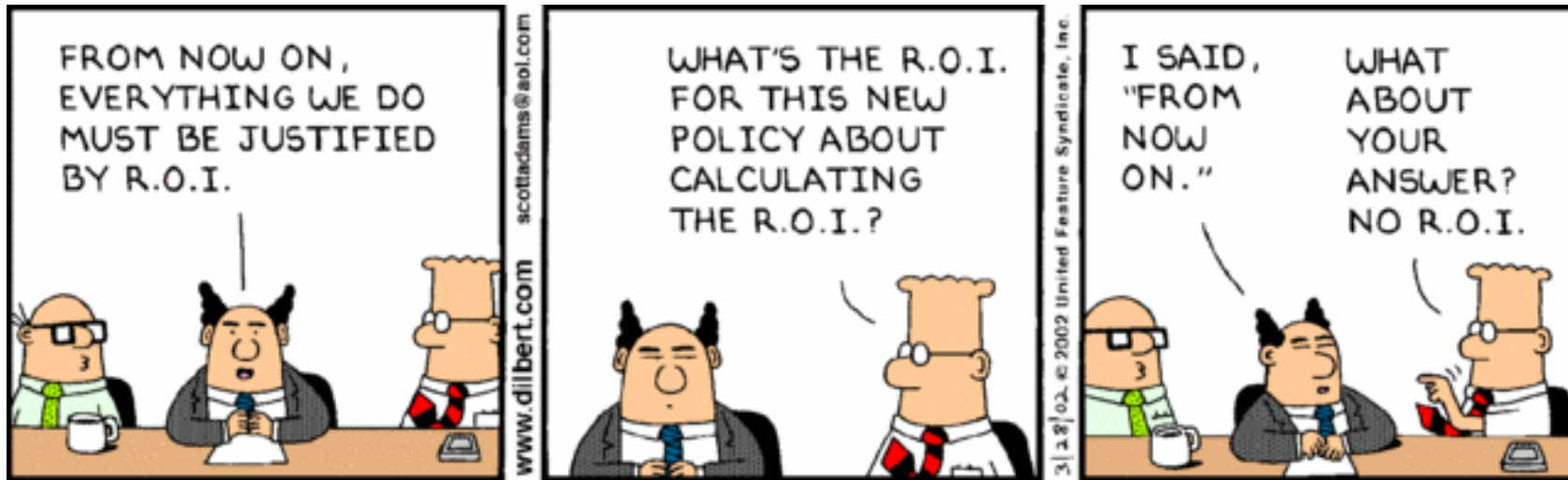


**Building Manufacturing Solutions
on the Ignition Platform**

Determining ROI....
Ignition Community Conference 2013

Jason Coope, PMP
Director of Research & Development

Determining ROI...



- ROI on software systems inherently tricky
- Projects don't happen in a vacuum
- Risk of not implementing may be considered, but not quantified...
- How did we determine ROI?
 - If we reduce plant operating expenses by 1% per year
 - If we improve product recovery by ½% a year
 - Then payback is less than a year

Before Ignition

DOWNSTREAM DAILY PRODUCTION REPORT

Shift Notes: Copper - 528

Total Shredder Box NFR (lbs): Loader Bkts Wt (lbs)

Total Infeeder NFR (lbs) (circle one)

Date: 5-7-10

Bro

Dm

3800

1

2

3

4

5

6

7

8

9

10

11

12

13

14

Lead

Sampling Data - Zorba

	Copper	Brass	Aluminum	Stainless	Ferrous	Lead	Circuit boards	ICW
Average	2.09%	2.12%	87.83%	4.71%	0.11%	0.36%	0.16%	0.17%
Min	0.00%	0.00%	78.54%	0.00%	0.00%	0.00%	0.00%	0.00%
Max	15.8%	7.0%	95.7%	13.8%	9.1%	3.1%	0.8%	1.1%
STDDEV	1.51%	1.41%	3.68%	2.24%	0.90%	0.55%	0.13%	0.15%

* All weights in grams

Date	Shift	Time	Size	Copper	Brass	Aluminum	Stainless Steel	Ferrous	Lead
5/19/10	Day		5 gallon bucket	13	17	9897	120	0	222
5/19/10	Night		5 gallon bucket	234	245	13855	960	0	274
5/20/10	Night		5 gallon bucket	59	90	12926	464	0	0
5/20/10	Day		5 gallon bucket	2198	158	11154	180	0	153
5/21/10	Day		5 gallon bucket	232	239	12755	567	0	0
5/22/10	Day		1 Box 1100lb	1072	1142	138330	4931	0	0
5/23/10	Day		5 gallon bucket	228	132	17187	602	0	88
5/23/10	Night		5 gallon bucket	128	198	17577	650	0	55
5/24/10	Day		5 gallon bucket	942	684	16758	255	0	59
6/9/10	Day	6:00am	1/2 5 gallon bkt	245	344	14066	533	0	101
6/9/10	Day	7:30am	1/2 5 gallon bkt	294	340	17487	368	0	0
6/10/10	Day	9:20am	1/2 5 gallon bkt	189	263	12460	644	0	0
6/11/10	Day	5:45am	1/2 5 gallon bkt	303	288	13699	776		
6/10/10	Night	11:45pm	1/2 5 gallon bkt	156	154	12585	510	0	95
6/10/10	Night	8:15pm	1/2 5 gallon bkt	79	90	10277	775		14

After Ignition



So what are the real benefits....



Better Use of Resources

- Automatic data capture
- Built-in analysis capability
- Access to plant data
- Eliminated middle management position
- More Analysis... less Data Entry
- Better quality of data

Improved Process Control

- Reduced Waste
- Reduced downtime
- Higher plant utilization

Informed Decision Making

- True cost of start-stop conditions exposed
- Real-time capture of 'Out of Process' conditions
- Changed the way maintenance is carried out
- Reduced run time between 'critical' maintenance
- Prioritized maintenance activities
- Changed the way production is managed
- Provided justification for capital projects

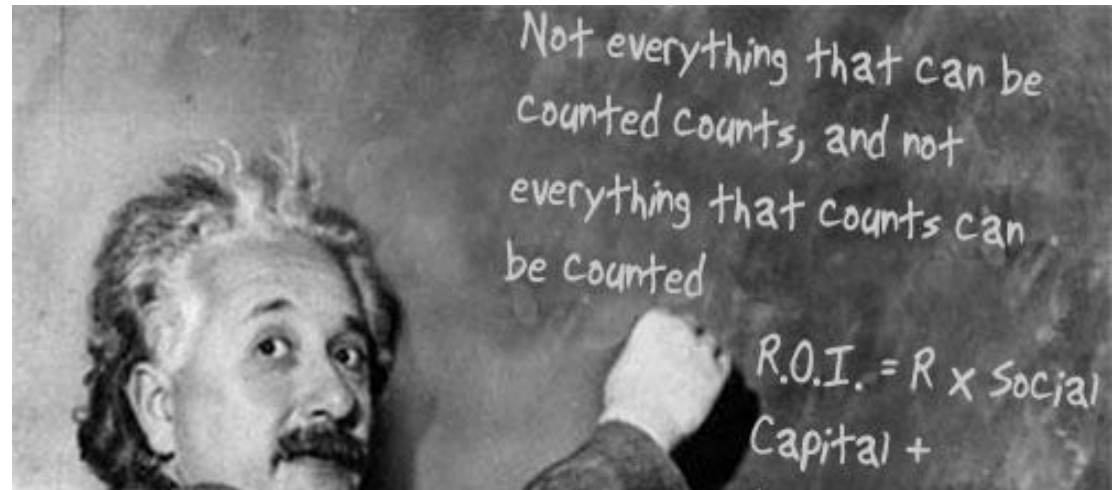
So what's the return...

Return is significant...

- Reduced metal loss
- Better plant utilization
- More effective workforce

Investment is insignificant...

- Development times are fast
- Framework costs are low
- Business model is awesome



'The Plant Management System brings everything together. Previously we were using 15 different spread sheets to track production, downtime, inventory, forecasting and sampling. The ability to have one system that tracks, graphs and gives us easy access to data on a day to day basis has freed up about two and a half hours of my day. ...we are now able to quickly react to the data and make changes to the operations as and when required. We can anticipate problems before they happen.

In the 4 months since the install, our conversion costs have dropped 3 cents a lb, despite intake shred feed volumes dropping by about 15%. This translates into an annualized savings of over \$200,000.'

JP Manager, Oakland

Thank you for your Attention



Schnitzer



**Building Manufacturing Solutions
on the Ignition Platform**

Obtaining Corporate Buy-in....

Ignition Community Conference 2013

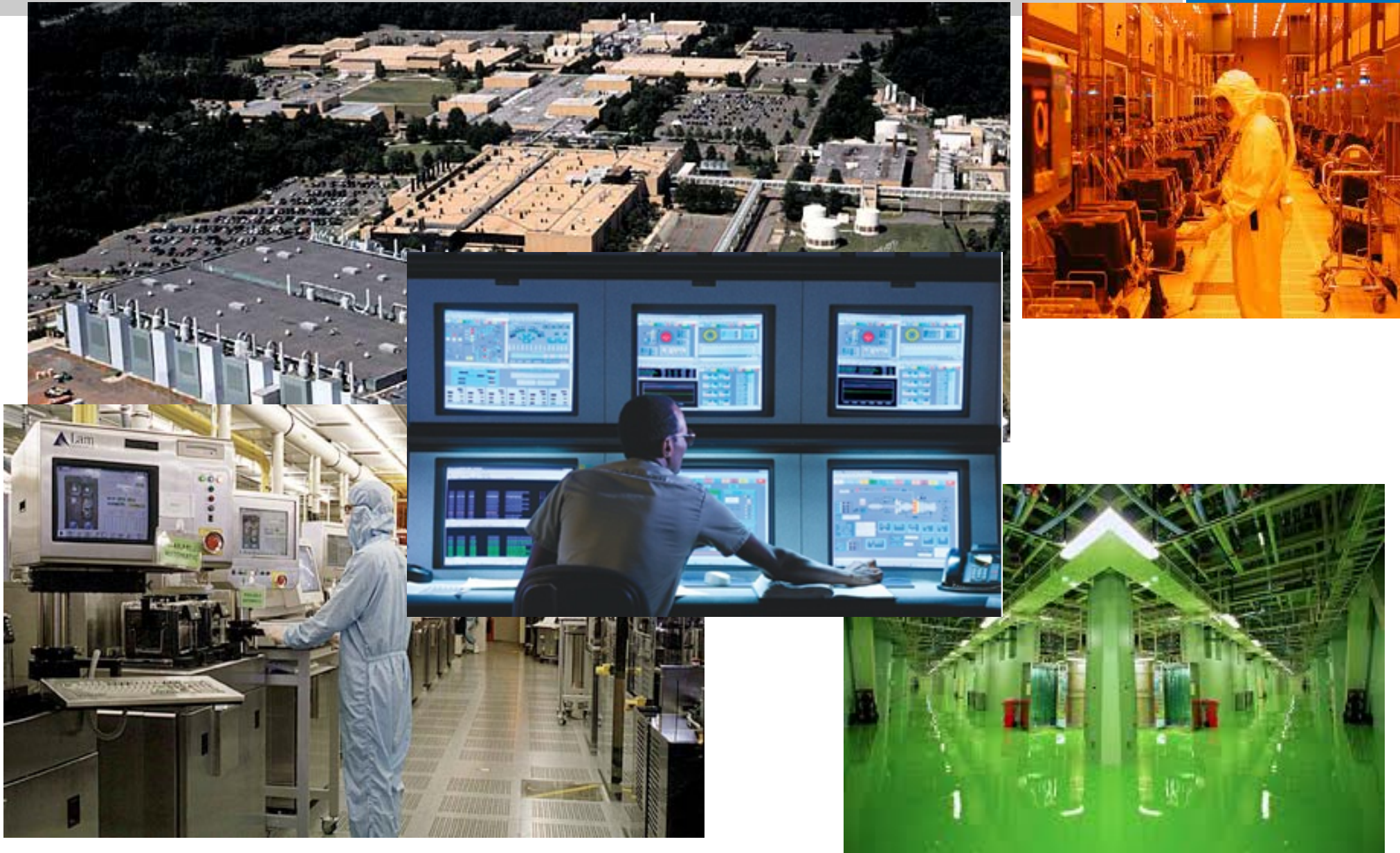
**Jason Coope, PMP
Director of Research & Development**

Obtaining Corporate Buy-In

- **Background**
- **Step wise approach**
- **Challenges**



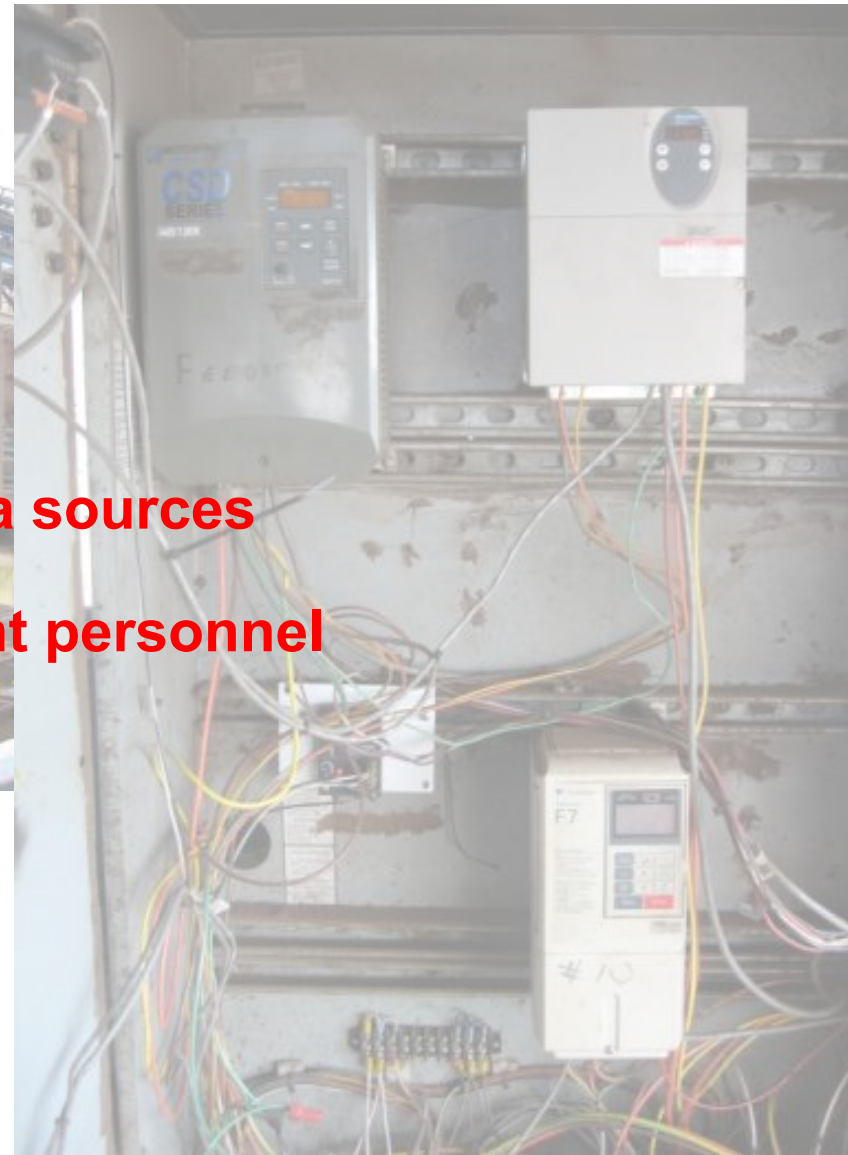
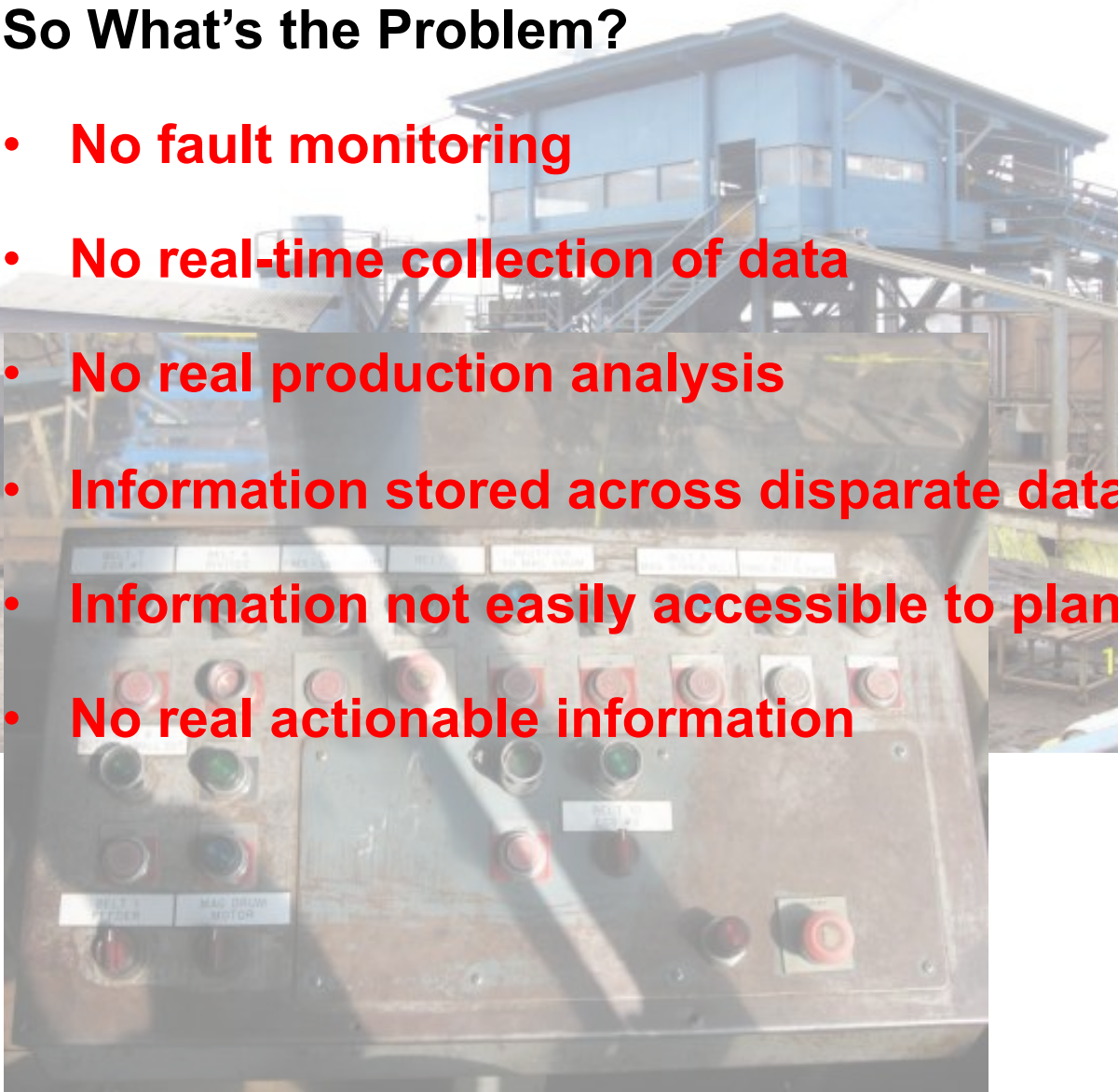
In a different industry



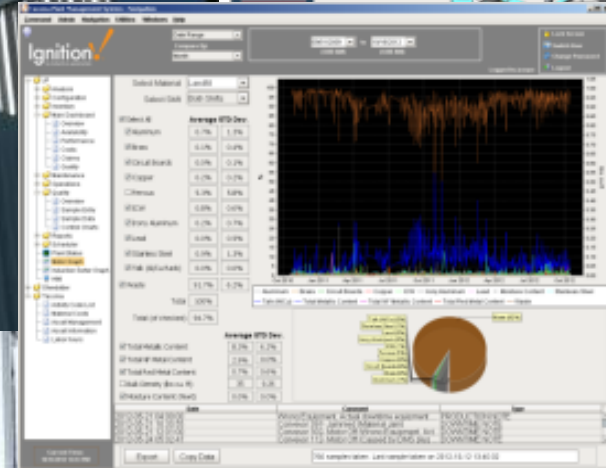
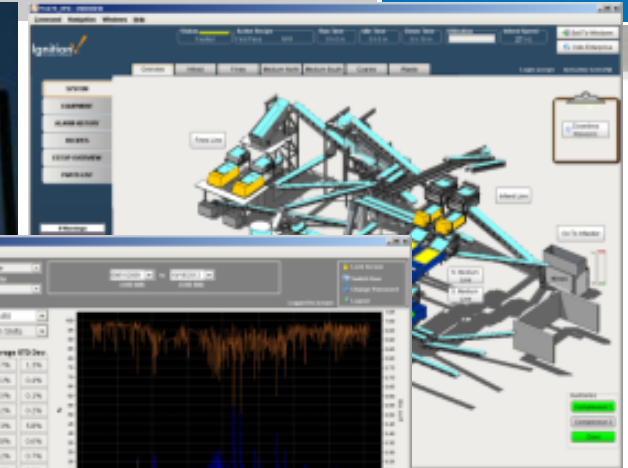
In this industry

So What's the Problem?

- No fault monitoring
- No real-time collection of data
- No real production analysis
- Information stored across disparate data sources
- Information not easily accessible to plant personnel
- No real actionable information

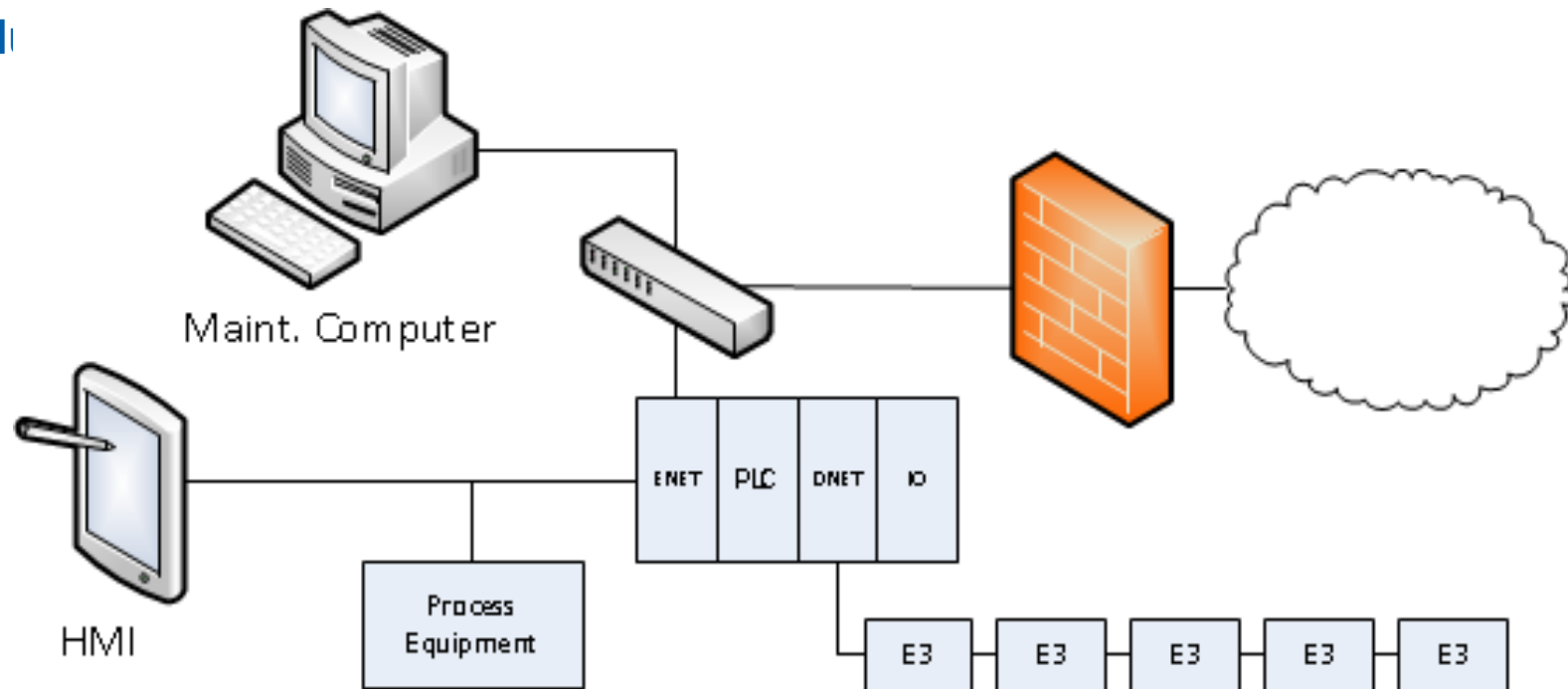


We've come a long way...



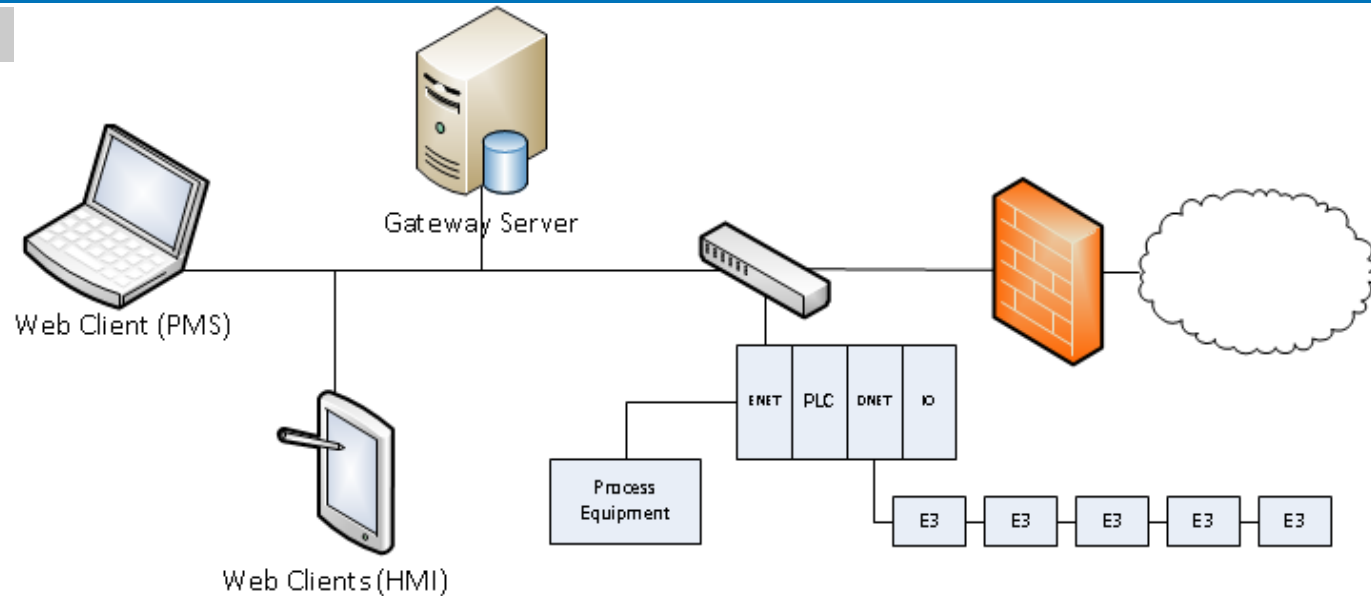
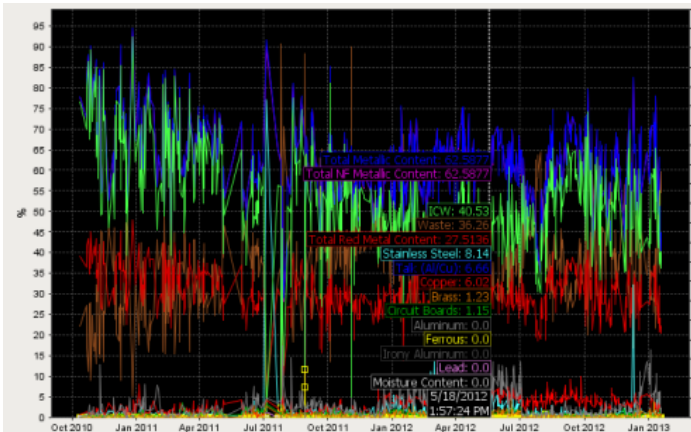
Automated Plant Control

- Sequenced startup / shutdown control
- Fault monitoring
- Redundancy

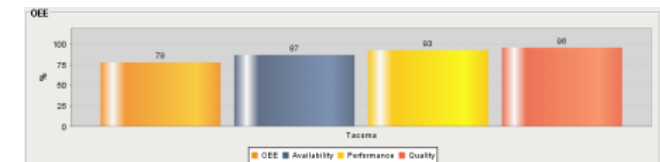
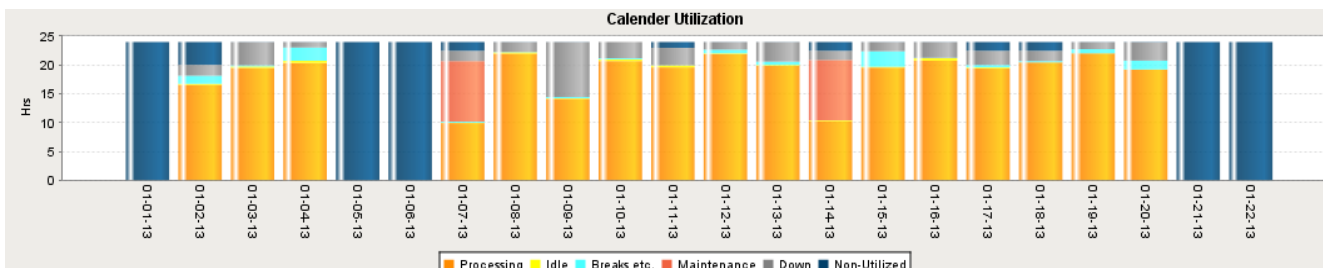
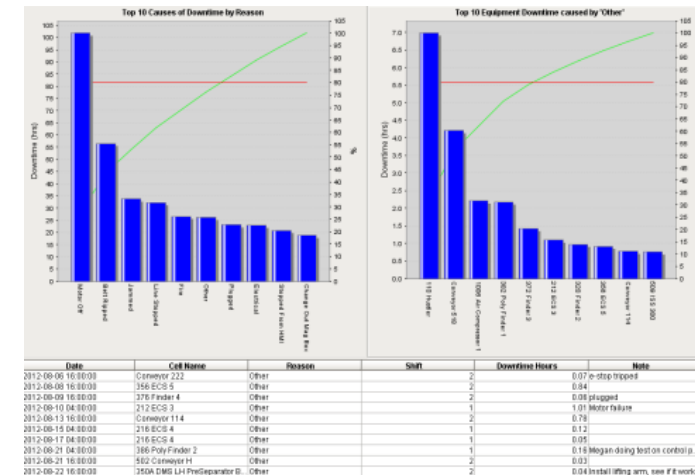


- No historical data collection
- No analysis capability
- Couldn't connect to OPC devices
- Limited users
- Security Issues

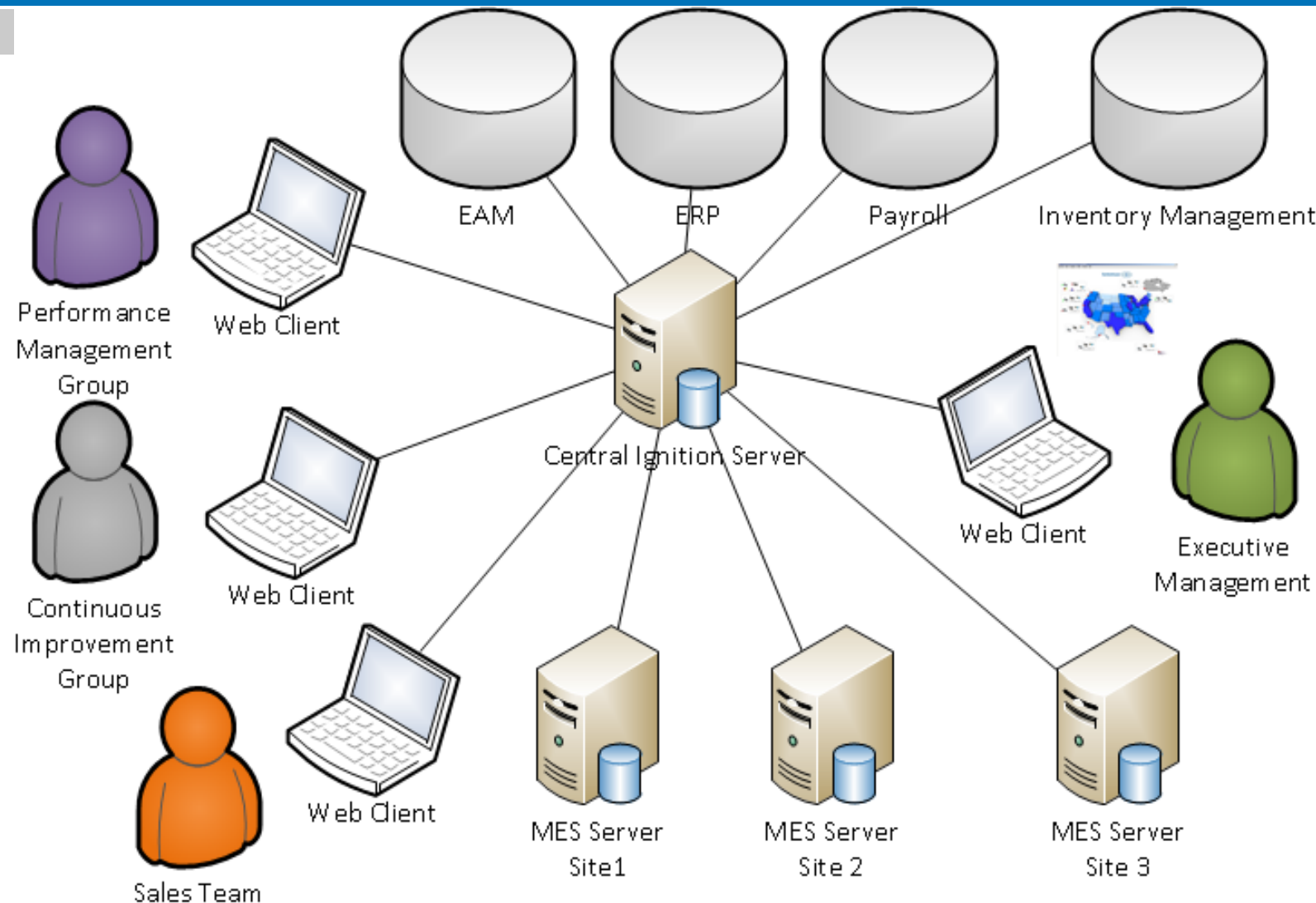
Manufacturing Execution System



- MES / SCADA / HMI Solution
- Production Scheduling / OEE
- Real-time Downtime / PARETO Analysis
- Process Historian
- Unlimited Access through Web Based Clients
- Security authentication thru LDAP / SQL Hybrid
- MES not connected to other information systems

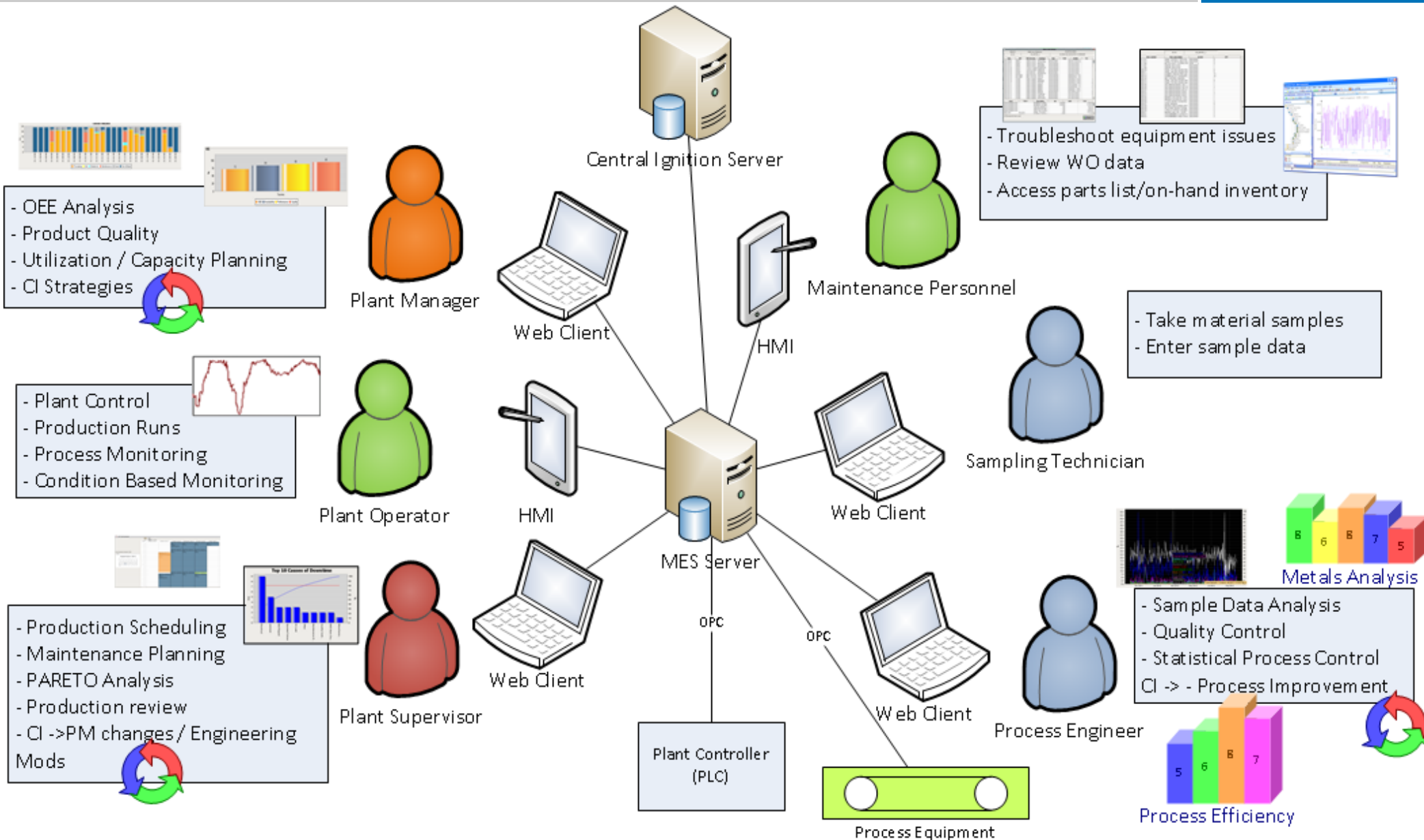


Enterprise Manufacturing Intelligence



- **Integrated view of all manufacturing data → Actionable Information**
- **Bi-directional: Business information flows down to manufacturing, manufacturing data flows up to business**
- **Web accessible to every level of the enterprise**

Information Driven Production



Obtaining Corporate Buy-in



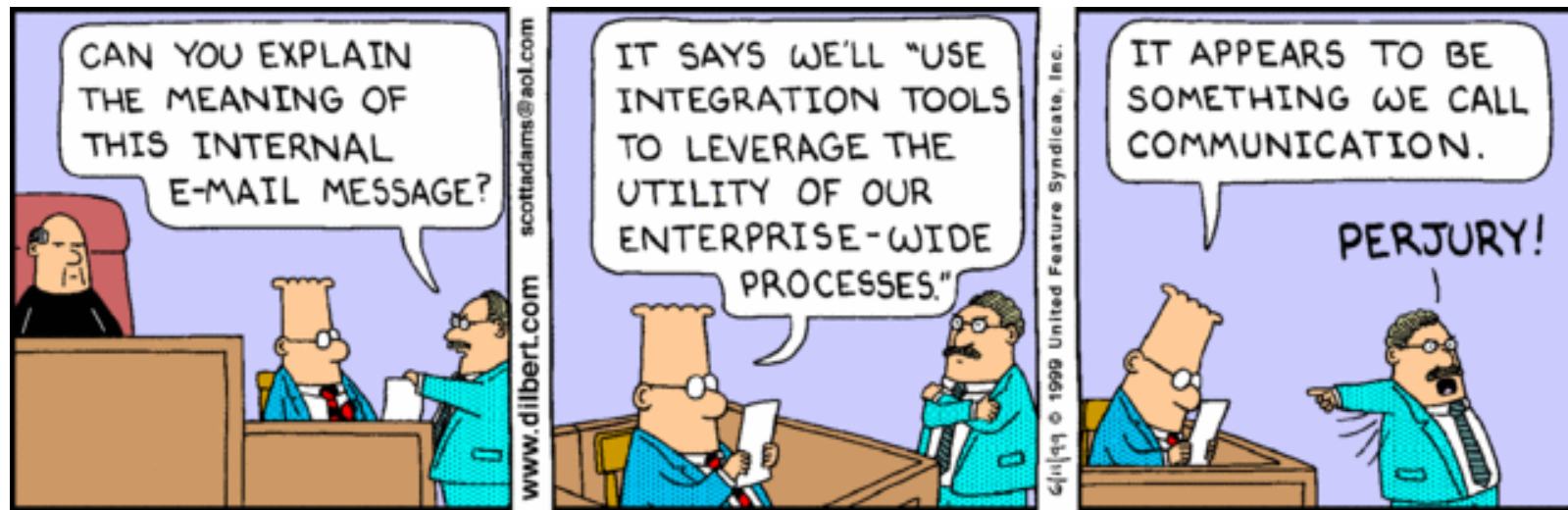
The Challenges

- 'New Kid on the Block' scenario
- Competing Technologies
- Prior experiences of previously failed technology projects

'Do More with less'

- A 5th generation language?
- Agile based development environment (evolutionary prototyping)
- AD authentication built-in / Database support built-in / OPC support built-in / Module Market
- Inductive developer support model = small in-house developer footprint

An Enterprise Solution for all



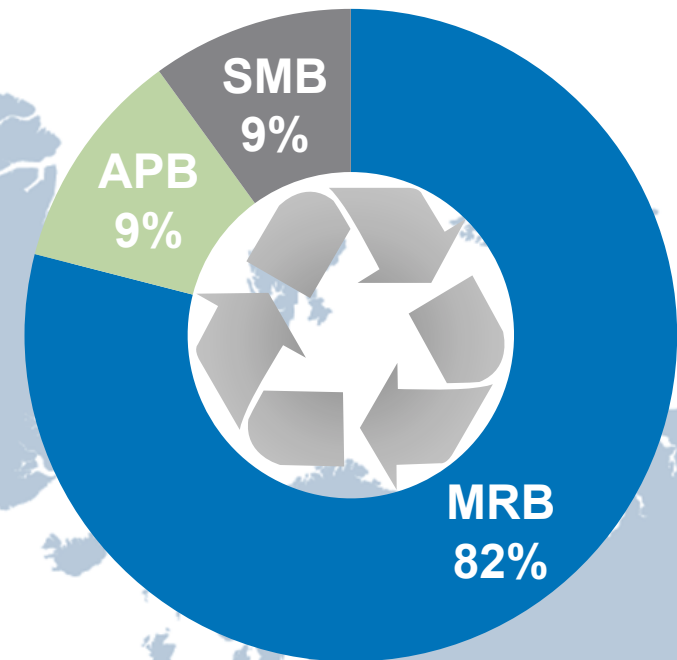
- **One solution for our Controls, Development Group and IT**
- Ignition provides a common development platform for our Plant Control Systems (HMI's), SCADA, Manufacturing Execution Systems (MES) and Enterprise Manufacturing Intelligence Systems
- Ignition is 'IT friendly'
- Ignition is the glue that makes our enterprise solutions work better

Thank you for your Attention



- **Metals Recycling Business**
 - Collection and processing of scrap
- **Auto Parts Business**
 - End-of-life vehicle recycling
- **Steel Manufacturing Business**
 - EAF producing rebar, wire rod steel products

2012 Revenue



SSI's deep water port facilities provide the ability to access the strongest markets at any point in time.

Our Track Record of Growth

2012

FY2005

Revenues: \$853M

Facilities: 41

Employees: 1,800

Today

Revenues: \$3.3B

Facilities: 121

Employees: 3,600

SSI Locations

○— **APB** (59)

○— **MRB** (58)

— **SMB** (2)

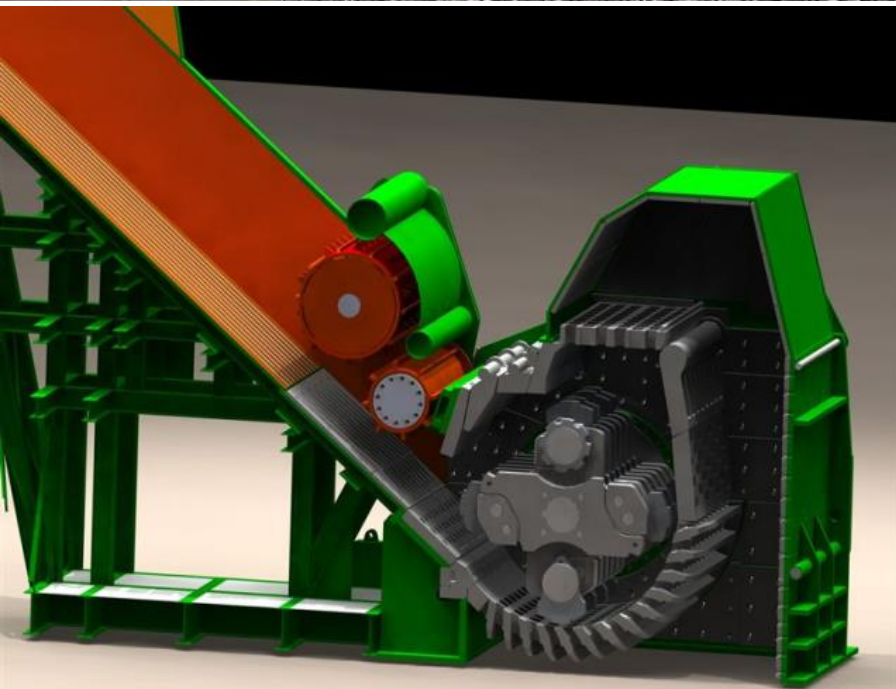
○— **Corp** (2)

ALASKA

HAWAII

PUERTO RICO

The Shredder



Rotational speed 450 RPM

Weight of rotor 133,000 lbs with bearings

Weight of hammers 1,000 lbs

of hammers 16

Processing time for one vehicle 7 seconds

Average TPH 205

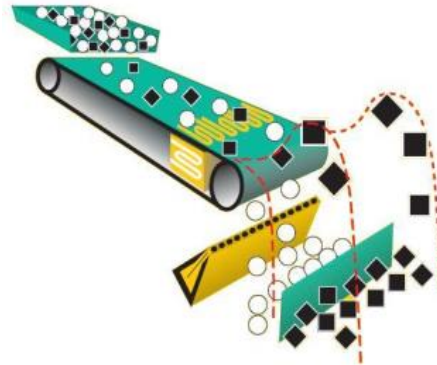
Energy usage 27 KWH/ton



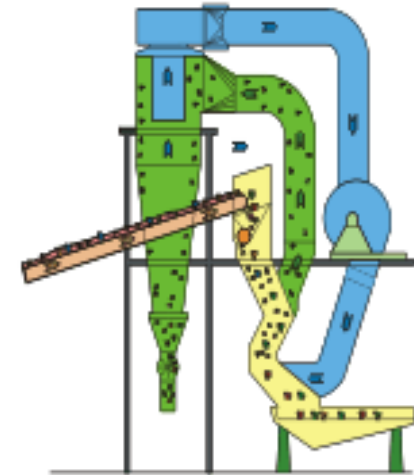
Non-Ferrous Metal Recovery



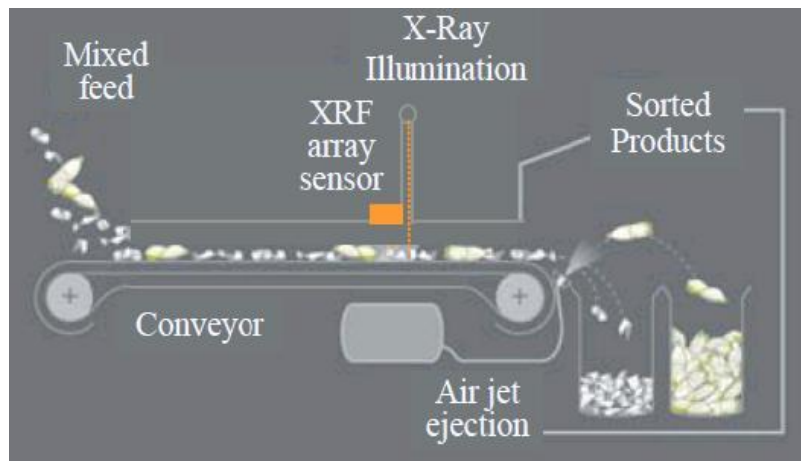
Eddy Current Separators



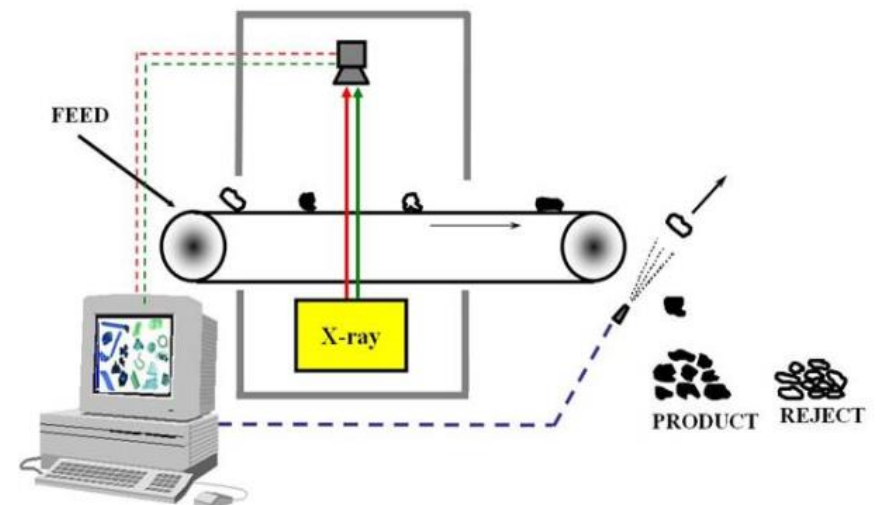
Sensor Sorters



Classifiers



X-Ray Fluorescence



X-Ray Transmission

When Worlds Collide...

Traditional Technology Group Divisions

Electrical Controls Group

- Electricians / Controls engineers / Plant Engineers
- PLC's, ladder logic, HMI development environment
- Proprietary Process Historian

Software Development Group

- Software engineers , computer science graduates
- OOP, re-usable components, COM / DCOM, Marshalling, abstract classes, inter-operability
- SQL

IT Group

- BSA's, Network Engineers, IT Admins, DBA's
- Network architecture, DBMS, CRM, ERP
- SQL

Technology Transcends Divisions....

One solution for our Controls, Development Group and IT

- Object-oriented development environment
- Rich component library with data binding
- Extensible through Java
- Python scripting
- SQL queries
- No proprietary language to learn
- Built-in OPC-DA and UA
- Built-in ODBC-JDBC data connectors
- Built-in security authentication through LDAP / SQL Hybrid
- Built-in Auditing



Web-Based
Deployment



Unlimited
Licensing



Security
& Stability



Real-Time Control
& Monitoring



Rapid
Development



Easy
Expandability

Shared Technologies

		Controls Group	IT
	Data Storage	SQL Database	Oracle / SQL Database
	Hardware	PLCs, PC's, switches, IO, computers, monitors, database servers, OPC servers	Switches, servers, PC's, database servers, tape storage
	Interfaces	OPC ODBC COM / DCOM RS-232 / RS-422	ODBC
	Dev. environments / languages	Ladder Logic, Structured text, Function blocks, VB, C, C++, .NET, Java, Python (Scripting languages)	SQL, Java, .NET, Python (scripting languages)
	Security	Active Directory Hybrid SQL Authentication	Active Directory Application specific user access controls
	Remote Access	Web-Clients, Remote Desktop, VPN	Web-Clients, Remote Desktop
	SDLC	Waterfall -> Boehm's Spiral -> Agile	Waterfall
	Responsibilities	Application Development & Support	SOX Compliance, ITGC Data Backup and Disaster Recovery System Availability
	Tools		TeamTrack Subversion