ekahau

Accurate Location in Wireless Networks

Enabling the Intelligent
and Safe Process Plant
March 2004

ekahau

Accurate Location in Wireless Networks

Where exactly is the valve marked for replacement? What is the maintenance history of this part? What area are the contractors in? Is Area 345B clear of staff? Where is the portable generator? Did everybody report at mustering? What is the best route to the nearest exit? How do I optimize my scheduled roundup?
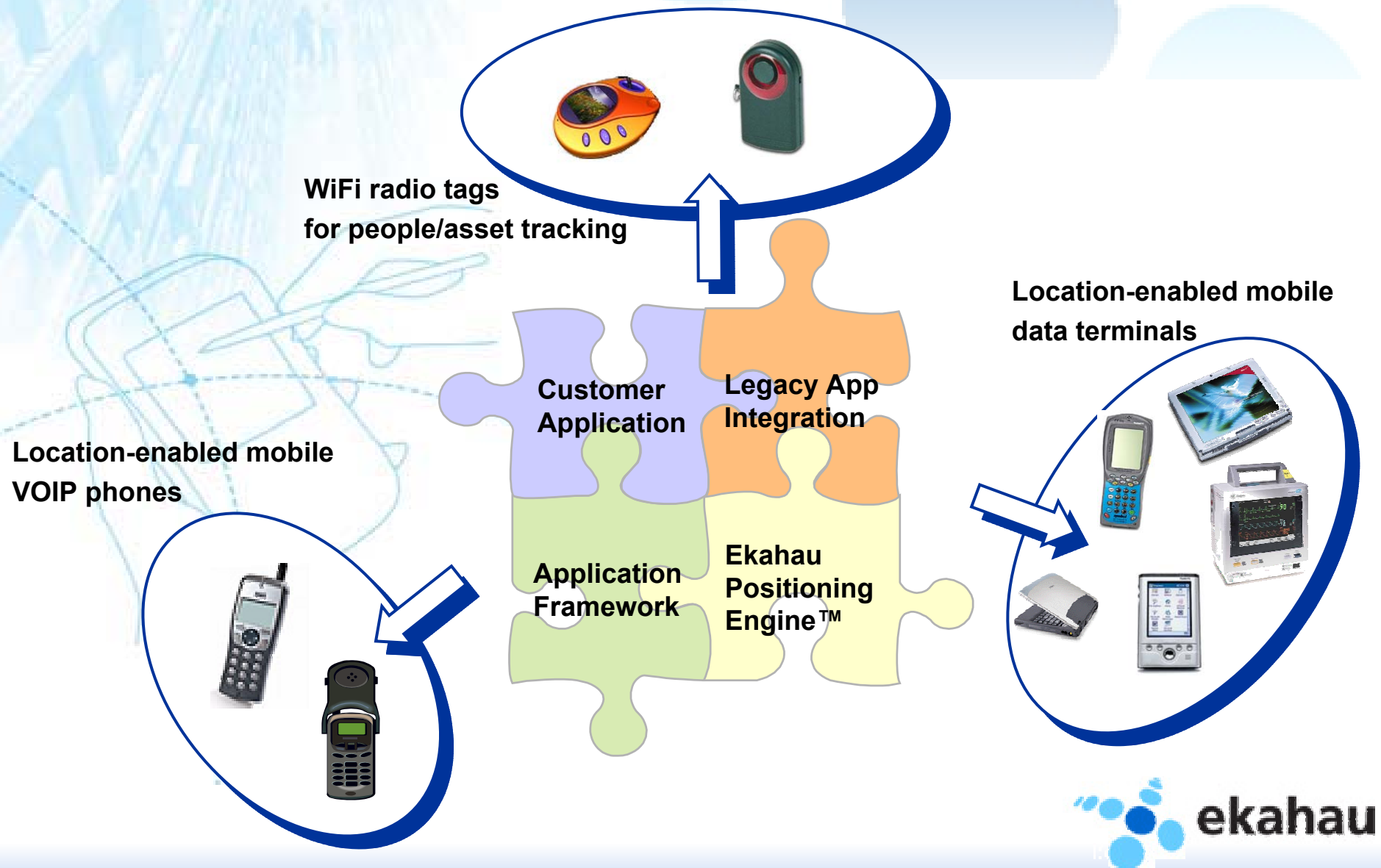
Ekahau in the Process Industry

Ekahau's wireless real time tracking solutions let process plants *optimize workflows*, *reduce equipment inventories*, and *increase staff productivity* while at the same time *decreasing errors and improving staff safety*.

Ekahau's technology facilitates more efficient production because of better plant uptime and more effective preventative maintenance. Improved staff productivity increases production margins.

Ekahau provides *very fast payback times* and *dramatic return on investment*.

Ekahau enables the Intelligent and Safe Process Plant

ekahau

Ekahau Solution for Industrial Plants

WiFi radio tags for people/asset tracking

Location-enabled mobile data terminals

Location-enabled mobile VOIP phones

Customer Application

Legacy App Integration

Application Framework

Ekahau Positioning Engine™

ekahau

Staff Tracking

- The Ekahau system can be used to locate plant staff using:
  - PDAs (Windows and Palm OS -based)
  - WiFi Tags
  - VoIP Handsets and specialty computing devices
  - Tablet PCs and or laptops
  - Barcode/Passive RFID scanners

- The system can provide real-time location data on the whereabouts of plant staff for:
  - Locating nearest employees in urgent repair situation
  - Analyzing workflow and operations efficiency
  - Locating employees in emergency situations
  - Improving staff productivity
  - Improving staff and contractor safety

ekahau

Equipment Tracking

- Any WiFi-enabled device (e.g. PDA, tablet PC or laptop) can be wirelessly tracked in real-time
- Non-networked devices can be tagged with Ekahau WiFi tags, enabling real-time tracking
    - intrinsically safe (IS) tags can be installed on any equipment and/or inventory parts
- The WiFi tag can be used for location but also to deliver telemetry data and alarms based on staff
- WiFi tracking can be integrated with barcode scanning or RFID systems
- Location information helps staff and contractors positively ID plant equipment or features

ekahau

Sample Process Industry Applications

Area	Applications	Benefits	Clients
Safety	• Lone worker Support • Mustering • Access control	• Improved staff safety • Faster emergency response	Tags, PDAs
Staff monitoring & guidance	• Tracking staff • Access control	• Improved staff efficiency	Tags, PDAs
Asset & event management	• Locate key equipment fast • Locate events/incidents fast	• Faster, more accurate turnaround in events/incidents • Decrease in excess inventory • Better preventative maintenance	Tags
Information delivery	• Push information • Location-based messaging	• Improved staff efficiency • Higher quality work • Better staff communication	PDAs
Workflow management	• Turnaround tracking • Expedited dispatching • Procedure recording	• Faster, more accurate action • Accurate audit trail and procedure control	PDAs

ekahau

Quantitative Benefits

- Opex reductions are immediate and significant
  - Studies[1] indicate opex reduction with a wireless maintenance system can be 10 – 15 %
  - Indicated margin improvement of USD 40 ¢ per barrel[2]
    - annual margin improvement in an average US facility over USD 1,3 M
- Effect of downtime prevention potentially huge
  - downtime cost in an average refinery can be USD 100.000 per hour and up
  - downtime percentage varies between 1,5 % (world class) and 4 % (poor)[3]
  - eliminating 0,01 percentage points of downtime (improvement of 2,5 – 7 %) results in an annual revenue gain of nearly USD 900,000
- With a USD 1,5 M system investment, payback time roughly 9 months with a 5-year ROI of over 550 %
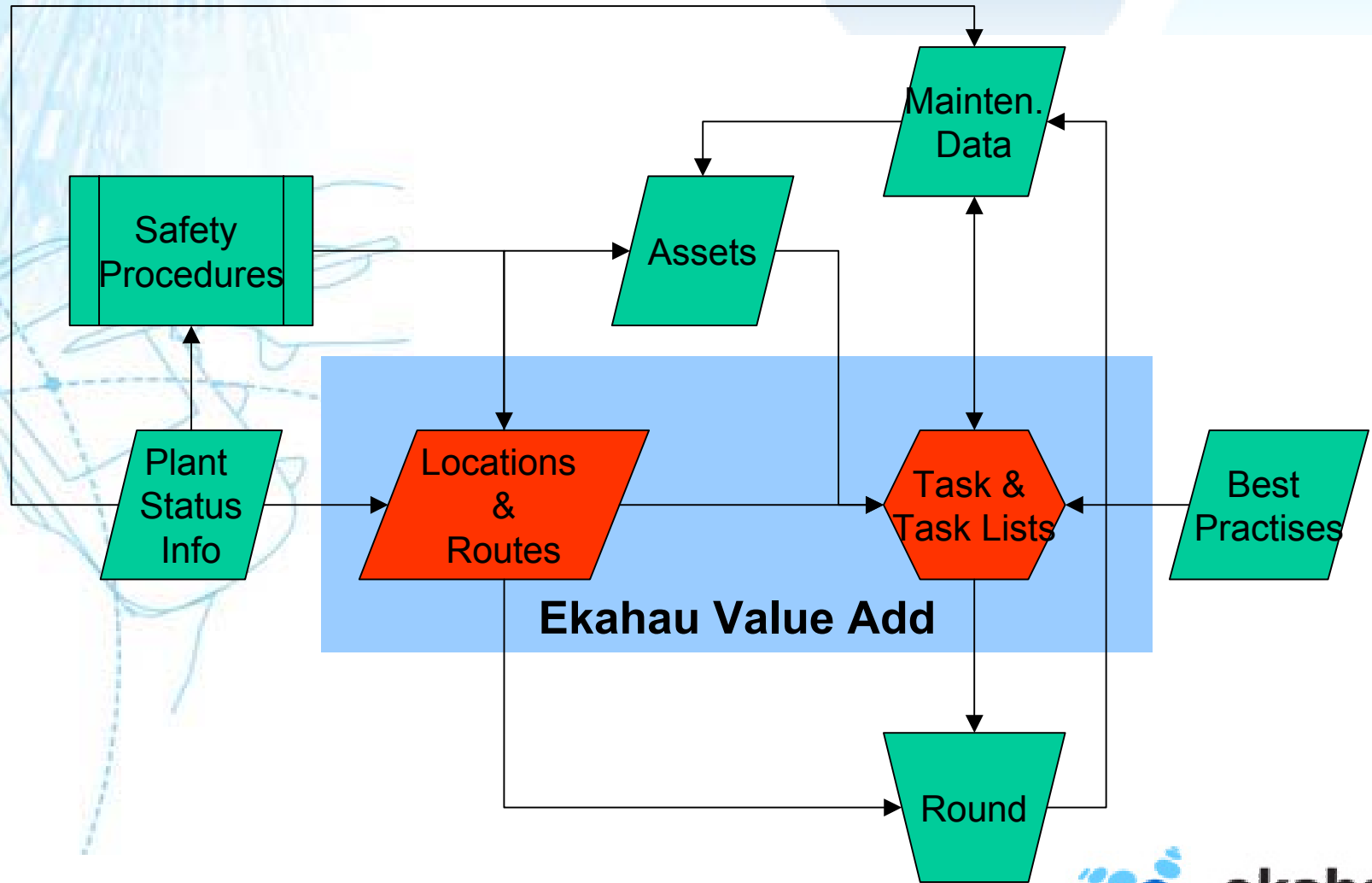
[1] Shell Global Solutions/CGEY
[2] Ibid
[3] Polaris Veritas

ekahau

Qualitative Benefits

- Improved safety
  - potential liability reductions and/or protection from both inside and outside claims
  - multi-million dollar claims common

- Improved staff satisfaction
  - more time for meaningful activities
  - improved safety improves motivation

- Improved maintenance record keeping
  - better accountability
  - improved audit trails and root cause analysis capability
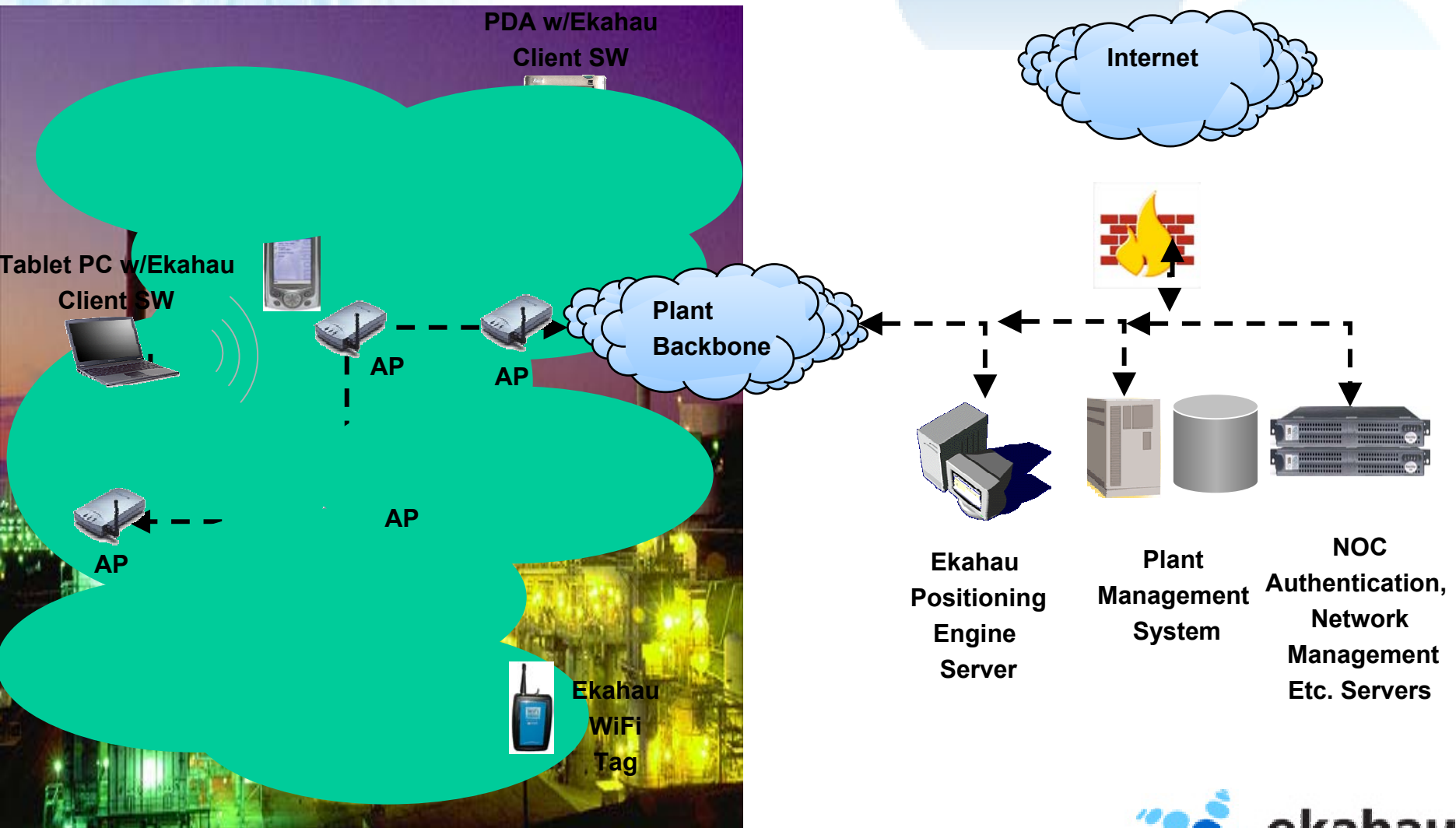
ekahau

Industrial Process Flow Fit

Mainten. Data

Safety Procedures

Assets

Plant Status Info

Locations & Routes

Task & Task Lists

Best Practises

Ekahau Value Add

Round

ekahau

Ekahau vs. Competition

	Ekahau	RFID	Proprietary RF/IR
No extra infrastructure required	✓	✗	✗
Real-time tracking	✓	✗	✓
Multi-technology ready	✓	✗	✗
Hardware cost per sq.ft	**< $0.50**	**$ 1 - 2**	**$ 3 - 5**
Built-in communication capabilty	✓	✗	✗
Tight PDA and workflow integration	✓	✗	✗
WiFi compatible	✓	✗	✗
Easily adaptable	✓	✗	✗
VoIP compatible	✓	✗	✗
Robust enough in hostile environment	✓	✓	✗

ekahau

Process & Infrastructure Fit

- Realizing the benefits does not require major process changes
  - patients and equipment are already tagged
  - staff carries multiple devices already
  - Ekahau streamlines existing processes, does not require drastic re-engineering

- Ekahau works on top of industry-standard WiFi infrastructure
  - no need for separate, proprietary networks
  - no interference
  - no extra security issues

ekahau

Ekahau Deployment at Subnet Level

PDA w/Ekahau Client SW

Internet

Tablet PC w/Ekahau Client SW

AP

AP

AP

AP

Plant Backbone

Ekahau WiFi Tag

Ekahau Positioning Engine Server

Plant Management System

NOC Authentication, Network Management Etc. Servers

ekahau

13

Key Point Summary

1. Ekahau can wirelessly track staff, equipment and contractors
2. Ekahau works with standard 802.11a/b/g networks
3. Ekahau is accurate, real-time, and unobtrusive
4. Ekahau supports and benefits all key processes
5. Ekahau provides measurable qualitative and quantitative benefits
6. Ekahau integrates with ERP and other back-office systems
7. Ekahau provides short payback time and strong ROI
8. Ekahau enables the intelligent process plant

ekahau

ekahau

Accurate Location in Wireless Networks

Thank You