Shaping ubiquity
... in the IT world
... for the developing world

ITU Workshop on Ubiquitous Network Societies,
8th April 2005

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Oracle Grid Customers Achieve 150% ROI Over 5 Years

123% savings in first year, finds independent study

Forbes, IDC, and Oracle grid customers in live April 20
webcast

NASA HAZMAT Program Relies on Oracle Sensor-Based Services

RFID boosts safety and security

The business value of sensor-based computing
Ubiquitous Networks

and

Ubiquitous Computing

Communication capabilities and Information Processing built into objects and environment
Linking Physical world to IT world

RFID Tag | Reader | Middleware

Hardware & Physics

Chip | Antenna | Edge Server

Information Technology

Applications & Database
Ubiquitous Computing Implications for IT

Execution of complex, interconnected software applications, spread across “computing devices”

- Standards, Security, Interoperability…
- “Intelligent software agents” specifically tuned to high-level proactive behavior (Service Oriented Architecture: discrete services in devices, self-identifying, interoperable)
- “Dynamically configurable processes” and transactions (peer-to-peer model, ad-hoc applications)
- “Smart applications” blurring the lines between standard application categories: business and consumer apps
- “Human centered product” design: pulling away from end-user intervention, putting into the product design and configuration process (context aware products)
Ubiquitous Computing
R&D Challenges

- Uneven conditioning
  - Masking unevenness and differences in the “smartness” of environments…
    eg. Disconnected

- Impromptu Interoperability: “accidentally” smart
  - the ability to interconnect and communicate with little or no advance planning

- Localized Scalability
  - Increased intensity of interactions between user & local surroundings…
    scalability by reducing interactions between distant entities (inverse square laws of nature)

- Inference in the presence of ambiguity
  - ubiquitous computing devices must be able to recognize changes in their environment, infer the action

- No Systems Administrator!
- Reliability of embedded software!
- Social Implications of Aware Technologies
  -> Privacy, Legal …
The Ecosystem: Business Model?

Customer ownership!

Revenue share!

Control and risk!

Platform!

Services!

Openness!

System Integrators

Apps Providers

Software Vendors

Content Aggregators

Customers

Device Vendors

Mobile Operators

Service Providers
Improving healthcare processes & delivery – some examples
Healthcare environments

A look at the different environments:

- Patient’s bed-side (acute care)
- Doctors’ Surgery (primary care)
- Persons home (community care)
Improving patient information at Point of Care

- Doctor Wireless Laptop
- Nurse Wireless PDA
- RFID Enabled Medications
- RFID Enabled Patient

Applications

Wireless transmissions

Database

0101
1010
1010
Improving the provision of emergency care

- GPS, GPRS, RFID
- Off-line Database
- Wireless PDA
- Application
- Database
- E-Records

Wireless PDA

Vasu Briquez, 8 April 05
Oracle Proprietary & Confidential
Improving the provision of emergency care

Tracking & tracing vital equipment in hospital buildings
Ubiquitous and seamless

Seamlessly combining multiple “pervasive” technologies

- Wireless
- intermittent connectivity
- RFID, sensors,
- Location technologies
- presence
- embedded
- M2M/Telemetry
- …

with IT Applications!
Improving Home Care

- Mobile Database
- J2ME
- Antenna
- City
- Workstation at Backoffice
- Central Repository
Meals@Home Video
Hospital Inventory Management
Stock control, Traceability, Reduced Stock-outs & Costs

- Realize a Safer, Smarter and Trusted Health Care -
Potential of “ubiquitous” in Healthcare

Improving Core Healthcare processes and delivery:

- Monitoring
  - Patient vital signs, bed usage, theatre usage
- Service Delivery
  - Medication management at point of care, operating theatre equipment / sterile services
- Locator Services, emergency services
  - Patient tracking, x-ray / scan tagging, vital medical equipment
- Home Care Services
  - Elderly patients, patients with difficulties due to accidents, illness
- Ancillary Services
  - Meal delivery, laundry services
- Audit, Security and Safety