



Enabling Brandable Energy Profile Management
To the Socially Conscious Consumer
While Expanding Amenities

Third Party Customer Face

The Story

- Well off empty nesters with a social conscience.
 - Socially Green
 - Willing to pay for it
 - Do not want to pay attention to it.
- They read about a new service offered by their security monitoring company Lots-O-Alarms (LOA) offering Green Energy Management.

LOA, already connected to homes, now offers Energy Management

- Customers can select from a variety of programs:
 - Lowest Cost,
 - All Renewable,
 - Nearly Green (Renewable unless cost exceeds baseline by 15%)
- LOA contracts directly with a number of energy producers to provide an energy pool for each of its programs.

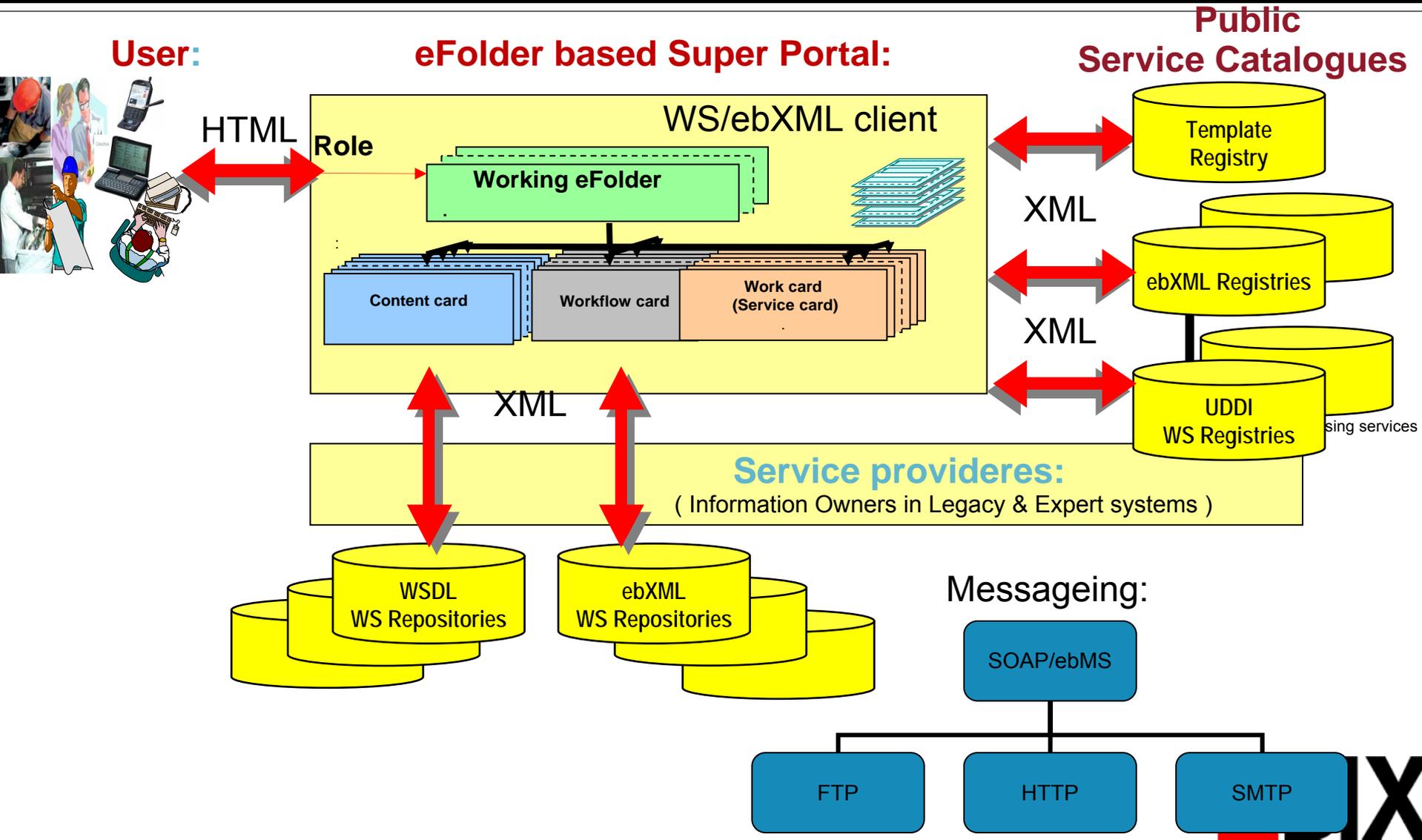
LOA Capabilities:

- directly reads the electric meters to get real time energy use rate throughout each day.
- re-uses existing internet connection to customer premises, installed for security alarm monitoring, to orchestrate services in each house.
- Probes network devices to learn of changes in house systems

Customer Control

- Select Energy Program to meet their needs and values
- Define in house priorities using LOA web site as often as they wish
 - Hot tub
 - Guests in for week-end
- Can be as involved or not as they wish

IT Archetype: European Seafood Safety Tracking System



Larger Context

- Well off empty nesters with a social conscience.
 - Socially Green
 - Willing to pay for it
 - Do not want to pay attention to it.
- They read about a new service offered by their security monitoring company Lots-O-Alarms (LOA) offering Green Energy Management.
- End Users make choices to enhance benefits, not just avoid cost.
 - Life-Style Choice
 - Cost Reduction is not only driving value
 - Requires “High Touch” responsive interface
- Consumer Choice not Utility Commission Mandate
- Open Interfaces to reduce friction between when customer makes changes to supplier relations

Opportunities and Environments

- Customers can select from a variety of programs:
 - Lowest Cost,
 - All Renewable,
 - Nearly Green (Renewable unless cost exceeds baseline by 15%)
- LOA contracts directly with a number of energy producers to provide an energy pool for each of its programs.
- Persistent Internet connectivity may already exist
- Enhanced Customer Choice drives acceptance
- Underlying framework for open markets in Energy

Customer Capabilities

- Select Energy Program to meet their needs and values
- Define in house priorities using LOA web site as often as they wish
 - Hot tub
 - Guests in for week-end
- User Interface is external to architecture, so no standardization is required
- Tactics are dynamic without long term lock-ins to particular approach.

LOA Responsibilities:

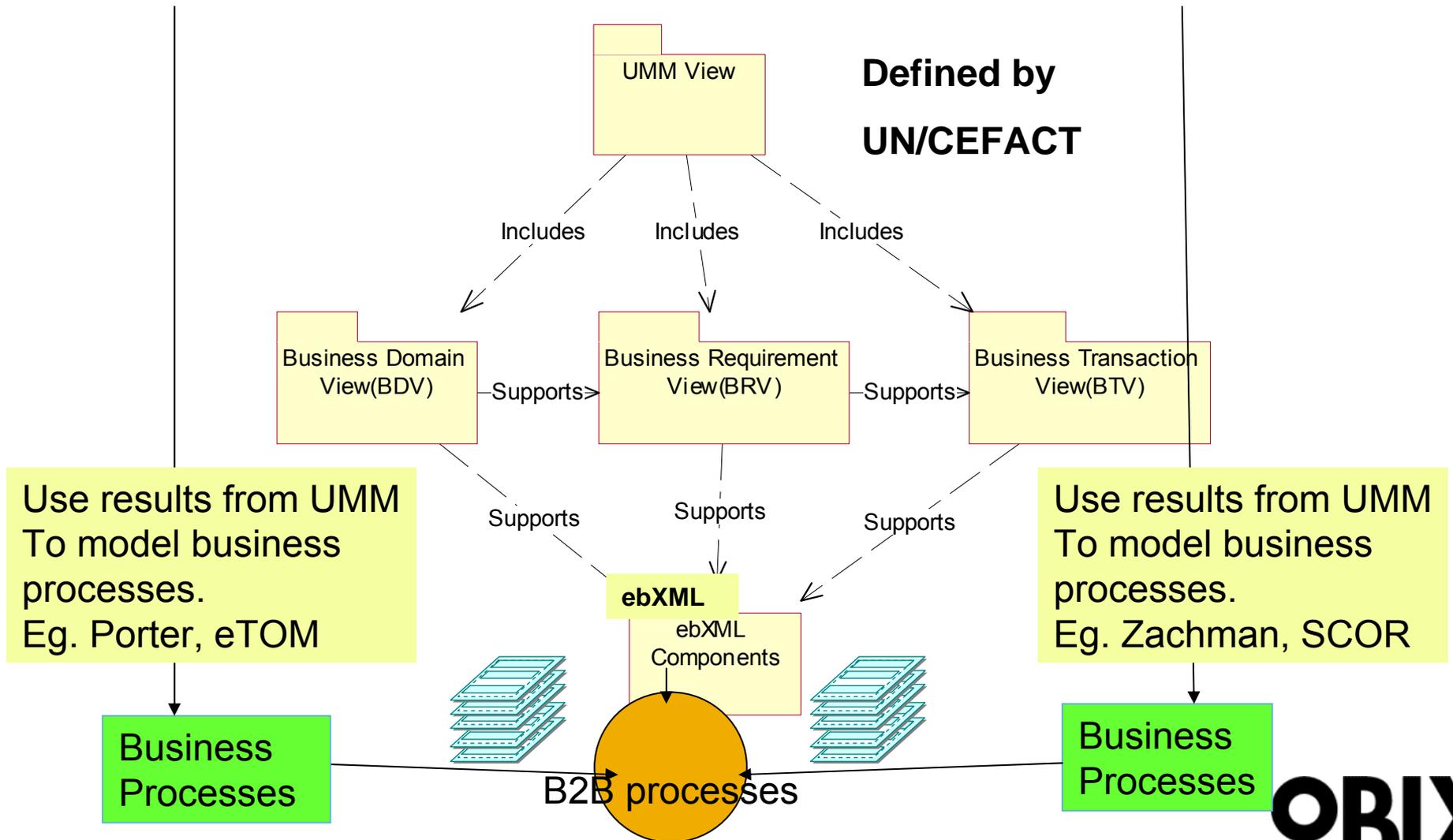
- directly reads the electric meters to get real time energy use rate throughout each day.
- re-uses existing internet connection to customer premises, installed for security alarm monitoring, to orchestrate services in each house.
- Probes network devices to learn of changes in house systems
- End User (and designee) direct access to meters
- Adaptive re-use of connections
- WS-Discovery to supplement whole-house registry.
- oBIX catalog of relevant points

Model Architectural Requirements

- Customers can log onto to a web site which queries their house for manageable service profile for the systems in that house.
- The customer can then set, as frequently or as rarely as they wish, which services they are willing to degrade to maintain load profiles.
- Although each house is different, LOA uses web services based on oBIX to operate house systems while hiding the complexity and diversity of different systems from its operating center.
- Internet connection enables user interface as well as remote procedure, but not with the same end-points
- Timing and non-repudiation become critical
 - Can changes be entered today to become effective next weekend?
 - Liability for damage if aggressive load management selected.
 - Liability for damage if power not supplied
- Must hide complexity / diversity of underlying controls to reduce market friction

Business Modelling with UMM

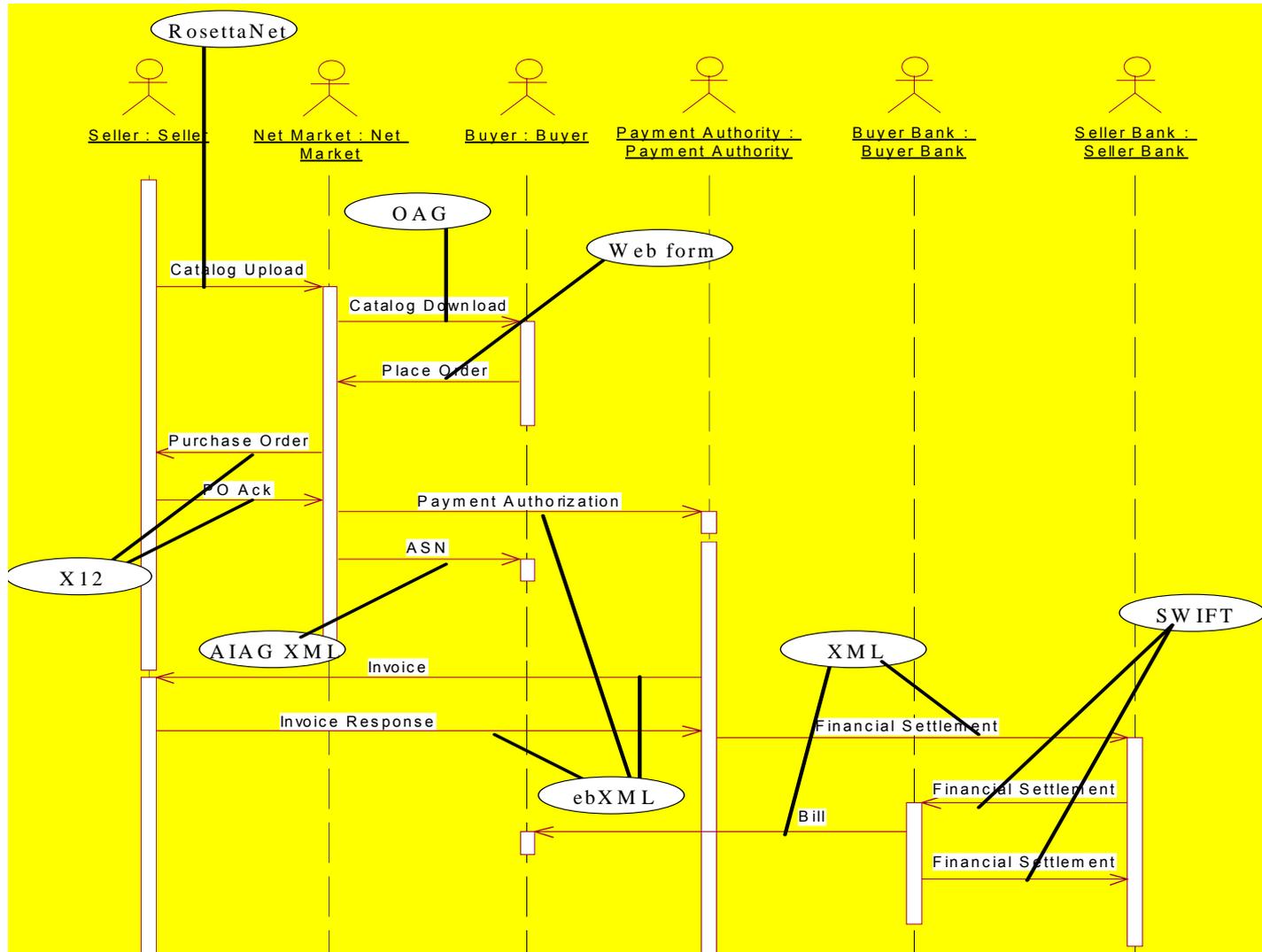
(UMM integrates different business models)



Virtual Enterprises offer cross-domain scenarios

- Service Oriented Enterprises can share any service externally as easily as internally
- Novel orchestrations of external services become virtual enterprises
- At the User Interface, Virtual Enterprises are indistinguishable from other enterprises.

ebXML supports the exchange of different payloads



LOA hopes to expand its offerings to support near-grid scenarios

- including local generation and storage of energy for some of its customers.
- Optimize performance and maintenance of customer systems.
- LOA is looking for higher premiums from both sides when it can
 - guarantee load shedding target in advance to producers
 - guarantee greater reliability to its customers.

LOA plans to partner with efficiency and maintenance organizations

- Virtual Corporations
- Semantic Interoperability
- Service Centric Software Engineering
- Local “men with trucks”

Shifting Power to Domain Experts

- Virtual Corporations leveraging 3rd parties for enhanced system [performance]
- Process Control Optimizers driven by Government Regulation is not 1st choice for Customer Service
- Metcalf's Law
 - Network Power increases as the square of the number of nodes
 - Applies to Service Nodes as aptly as to Network Nodes

Key Challenges as Protocols Mature

- Statefull to Stateless
- RPC to Message
- Request to Binding Contract
- Vocabulary to Semantics

New Niches as Market Matures

- 3rd Part auditing
 - of Service Levels
 - of Power Generated
 - Including semantic description
 - of Power Consumed
- House System Analytics
- Privacy Framework

Can regulatory framework we design today support such niches without collapse?

Regulatory Meta-Issues

- Open Access to Metering Data
- Enforcement of Contracts
 - Security Assertions and Non-Repudiation
 - Even if it means throttle on home/group
 - Managing Liability
- Privacy Management
 - Transactional Data vs. Federated Security