Mashups and Business Process Management in SOA

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Overview

- Mapping SOA to Business Goals
- Business Process Automation
- Mashups
- Services Ecosystem Stages
- A Mashup Story

Building a better business

Typical goals:

- Lower costs
- Improve response times
- Improve reliability
- Support customization
- Decrease overall risks

Trend towards increasing automation

What is a Business Process?

- What is a business process?
  - A process you need to run your business!
  - Any well-defined interaction between systems and people, triggered by events, using logical decision points, and with clearly defined flows

- Examples:
  - When processing an order, connect to the billing system and raise an invoice.
  - When handling a problem ticket, escalate unresolved tickets.

Business Process Management

- Defining,
- Executing, and
- Monitoring
  - Business Processes
  - Typically *long-running, stateful* processes

- SOA enables BPM
  - Connecting services on diverse systems workflows
  - Use and reuse of data and services from other applications

- Almost everything useful to a business is a process

Executable business processes

- There are many approaches to executable business processes:
  - XPDL
  - BPML
  - YAWL
  - jBPM
  - WS-BPEL 1.1

- BPEL 2.0
  - The industry standard

BPEL

- Business Process Execution Language 2.0
  - An executable XML language
  - With some graphical views (but not standardized)
  - Used by the major BPM vendors (IBM, Oracle, Apache ODE, WSO2, Intalio, ActiveVOS, etc)

```
<sequence>
        <!-- Receive the initial request -->
        <receive partnerLink="partner"
                portType=“p:PartnerPT"
                operation=“approval"
                variable=“approvalRequest"
                createInstance="yes" />
```

Why use BPEL instead of Java?

- 1. Managed execution
  - Monitor the progress of processes
  - Stop, start, restart, inspect
- 2. Structured approach to long-running processes
  - Easy to build processes that stop, restart and interact with systems in asynchronous patterns
- 3. Excellent support for transactions and compensation
  - Build clear logic for dealing with problems in long-running flows
- 4. Visualizing the flows helps communicate between the sponsors and the coders
  - Managers, analysts and users can be taken through the logic and validate it

None of this is impossible in Java – you could use a framework to gain these benefits – but BPEL has it all in a simple package

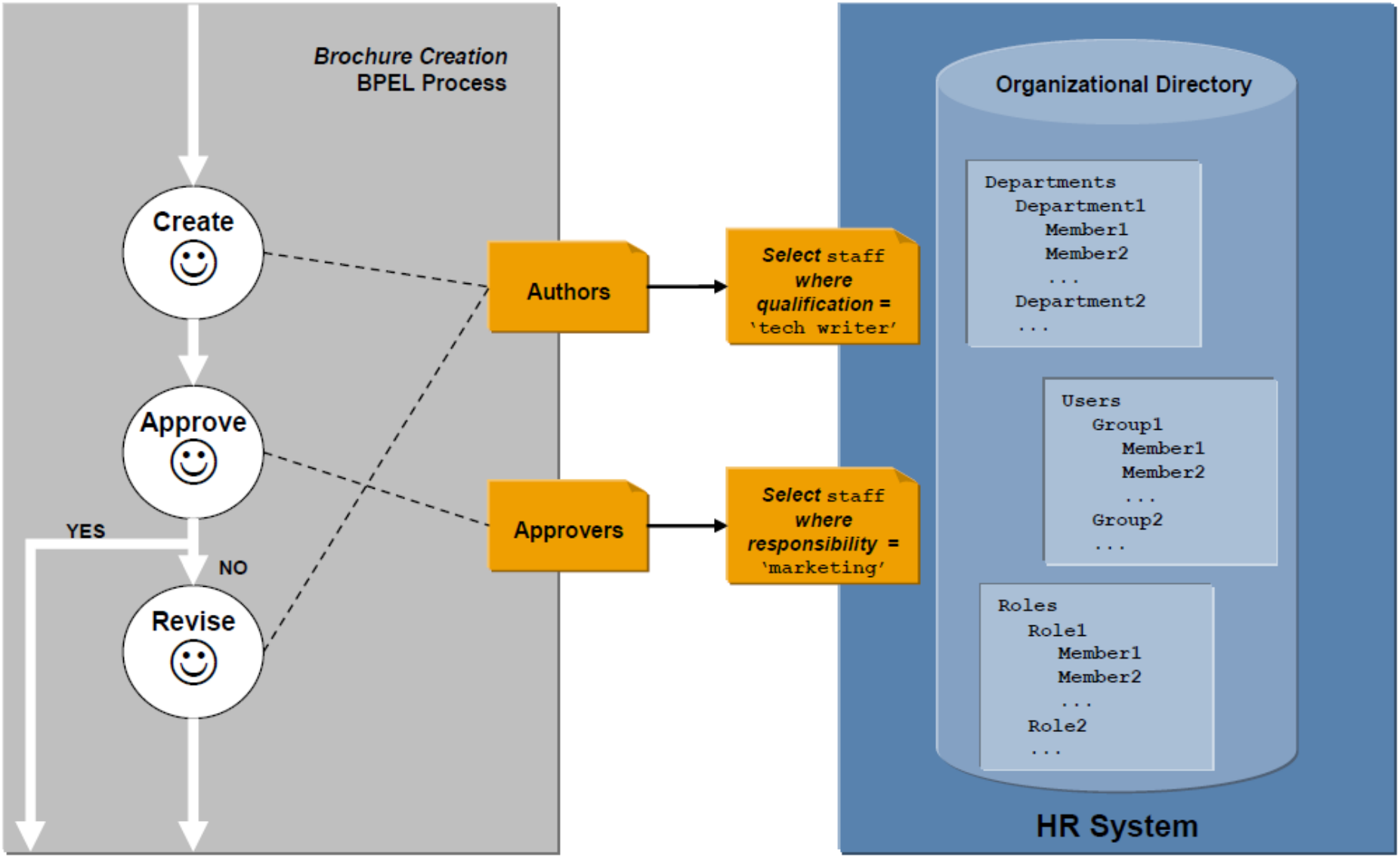
Executing Business Processes

- Develop Business Process definitions
  - Business Process Modeling Notation
  - Synchronizing Business and Technical goals
- Write BPEL
  - Graphical Editor
  - XML coding
- Run a Business Process Server
  - WSO2 Business Process Server
  - Microsoft Biztalk
  - Oracle BPEL Process Manager
  - IBM WebSphere Process Server

Bridging People and technology

- Many processes interact with people
- With pure BPEL you can interact with people
  - But you have to do the work
  - Integrate a portal with a process server
- Two new specs help out massively
  - WS-HumanTask
  - BPEL4People
- Patterns:
  - 4-eyes
  - Escalation
  - Nomination
  - Chained execution

BPEL4People model



Mashups

What is a Mashup?

Mashups in Music

- Term originates in music – remix of existing music into something new and unique
- Uses the existing data (tracks) as they are found
- Enabled and popularized by technological innovation, lowering cost and skills for entry

Mashups in IT

- Remix of existing data (usually internet) into something new and unique
- Uses the existing data (web pages, web services, feeds) as they are found
- Enabled and popularized by technological innovation, lowering cost of entry

What Technological Innovation?

- Emergence of readily accessible information sources (the Internet, enterprise SOA, desktop data)
- Standard formats and protocols
- Mashup platforms and tools
  - Lower the barriers to entry
  - Lower the cost of each project

Mashup Long-tail Scenarios

- Bridging domains
  - Mining data from Web pages
  - Processing events
- Aggregation/correlation
- Reporting
  - Reports & visualizations
  - Notifications
  - Dashboards
- Customization/personalization
- Decision “Agents”
- Periodic tasks
- Monitoring conditions

Components of a Mashup Platform

- Ability to simply access a wide variety of information sources
  - Web services
  - Feeds
  - Scraped web pages
  - Files
  - Email
  - Instant messages and other event sources

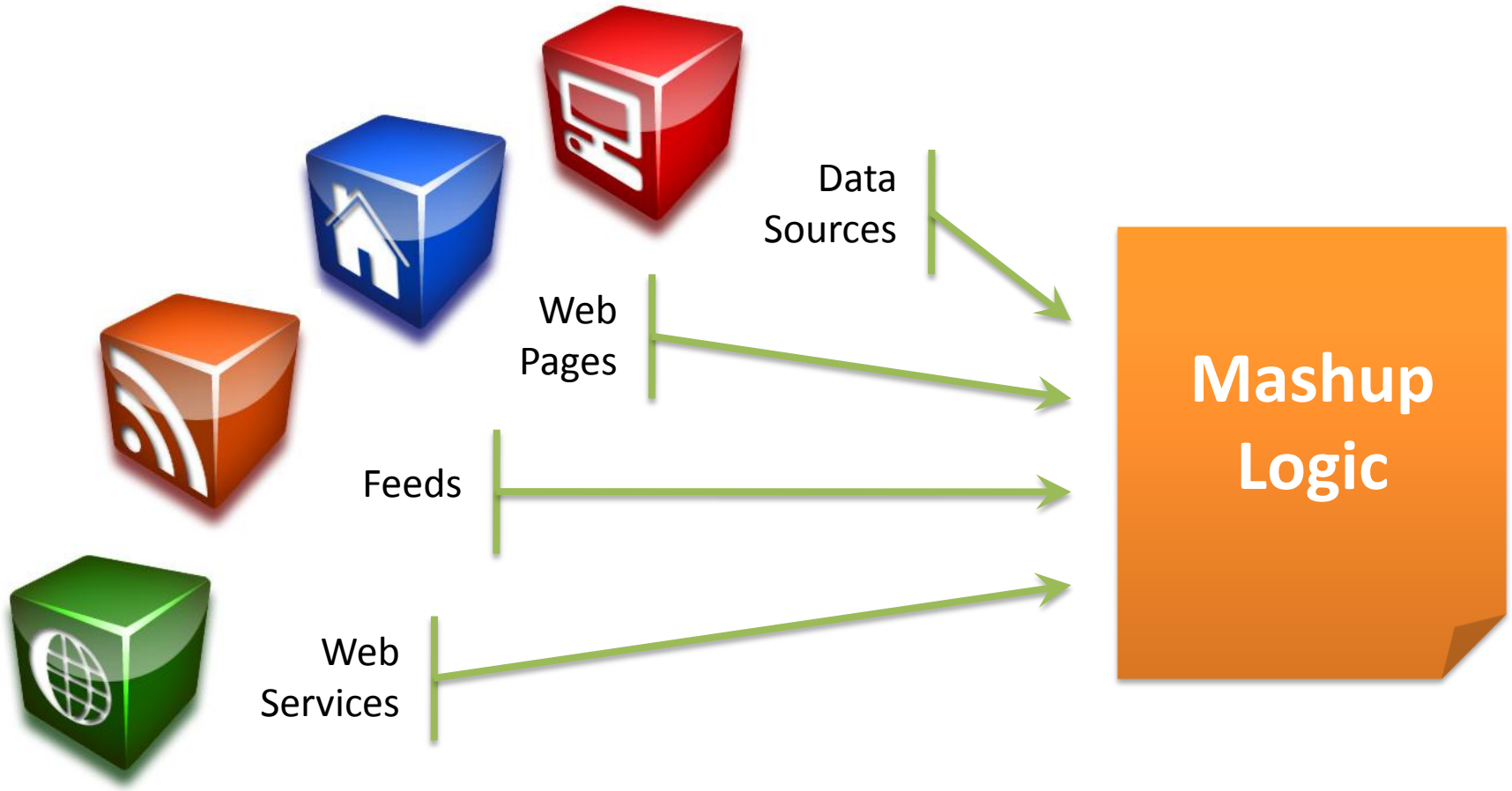
Components of a Mashup Platform

- Logic language
  - Graphical designer
  - Declarative language
  - Scripting language
  - Programming language
- Tradeoffs - list increases in power, decreases in accessibility

Components of a Mashup Platform

- Providing or presenting output
  - Machine readable
    - Web services
    - Feeds
    - Database/File system writes
  - Human readable
    - Web pages
    - Widgets/Gadgets
    - Feeds
    - Email
    - Instant messages/SMS

WSO2 Mashup Server Architecture

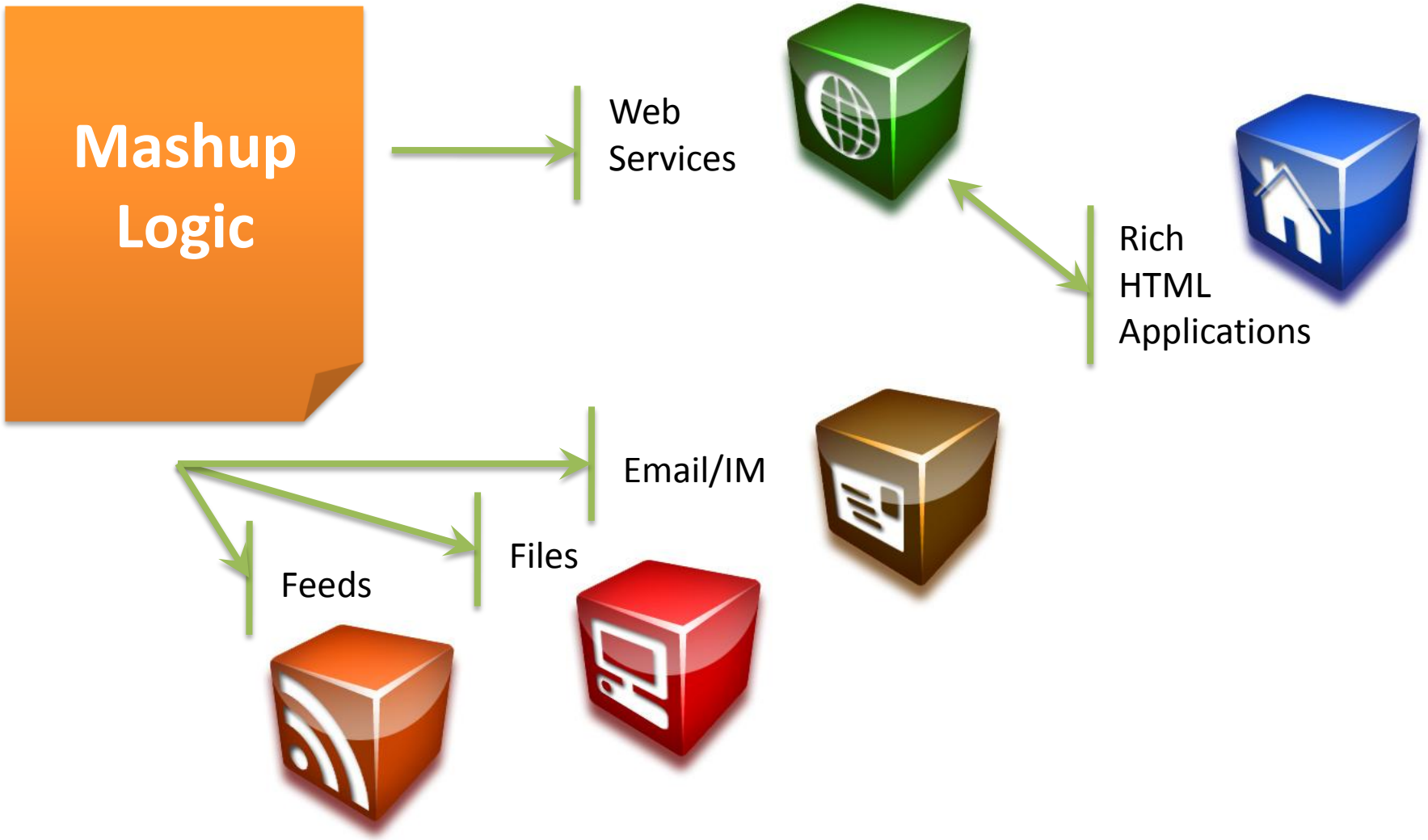


WSO2 Mashup Server Architecture

Mashup Logic

- Javascript (E4X)
  - Simple service deployment
  - Service composition
  - Workflows
  - Service translation
  - Service UI building
  - Rapid prototyping

WSO2 Mashup Server Architecture



Why use Mashup instead of BPEL?

- Lighter weight
- Rapid development
- Broader developer base
- Broader definition of “services”
- Typically serves end users

Similar outcomes – different approaches

SOA Stages of Evolution

- BPM and Mashups drive SOA evolution
  - Stage 1: Exposing services, connecting systems
  - Stage 2: Automating high value business processes (BPEL)
  - Stage 3: Helping knowledge workers leverage the business infrastructure (mashups)
  - Stage 4: Recurse

SOA Stage 1 – High Value

- Exposing services, connecting systems
- EAI, App Servers, ESBs

SOA Stage 2 – Medium Value

- Business Process Execution Language for Web Services (BPEL4WS) is a declarative language for defining a “business” process as a series of interactions between services.
- Output is more services.
- Used for automated flows – what happens in the SOA stays in the SOA.

SOA Stage 3 – Long Tail

- Low investment
- Small user community
- Limited lifetime applications
- Situational applications

Services Ecosystem

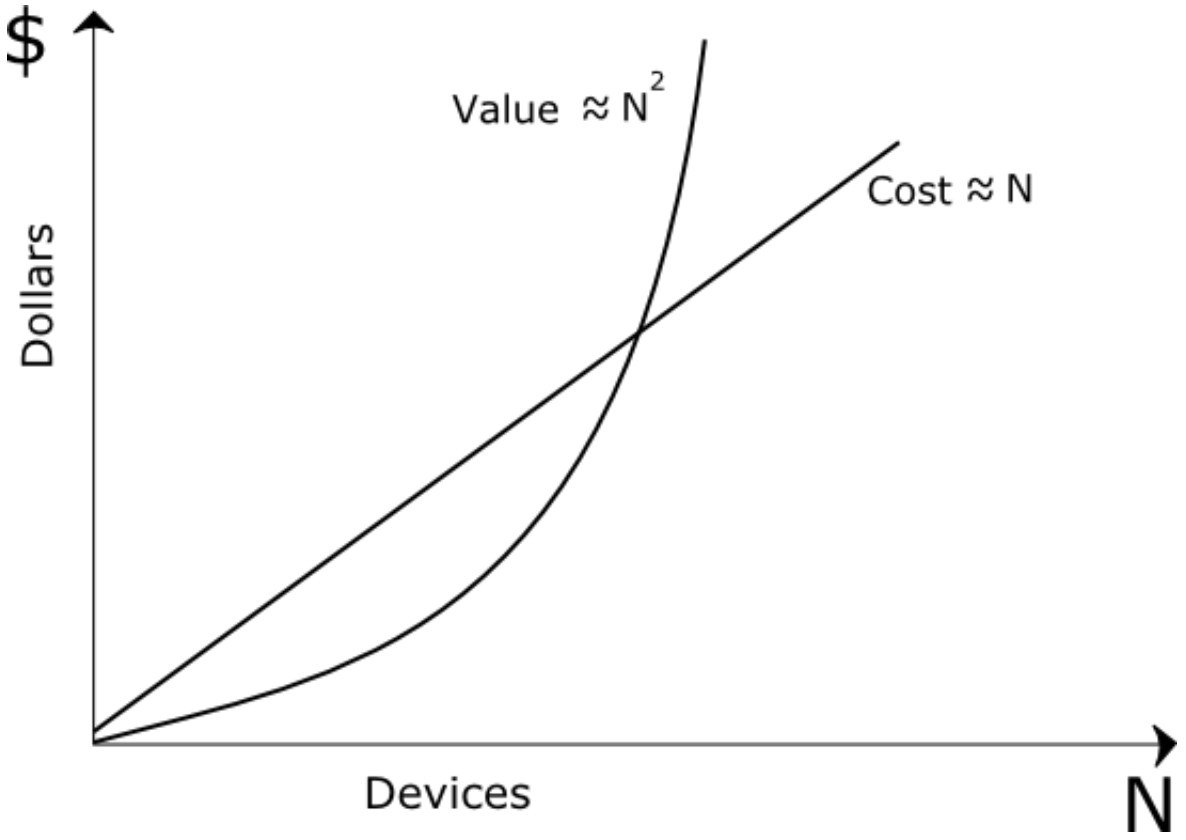
BPEL services and Mashups serve the long tail of services

- More Services => More possible connections
- More connections => More potential applications
- More potential applications => Business agility
- Business agility => Competitive advantage
- Competitive advantage => Leads to profits

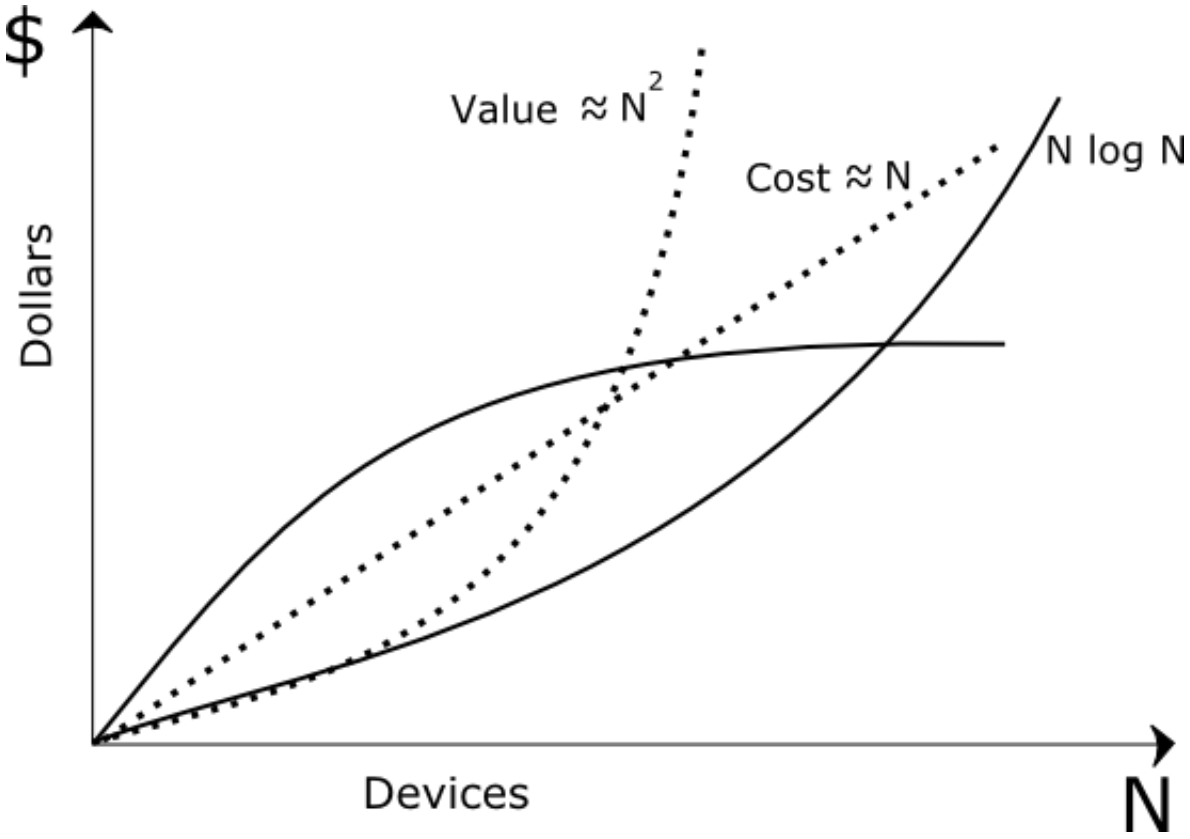
Metcalfe's Law

Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system (n^2).

Metcalfe's Law



Metcalfe's Law Adjusted...



A Mashup Story

- "Business" goal
  - Automated check-in on Southwest Airlines
  - Best seats available exactly 24 hours before departure
  - No service interface (just a web site)

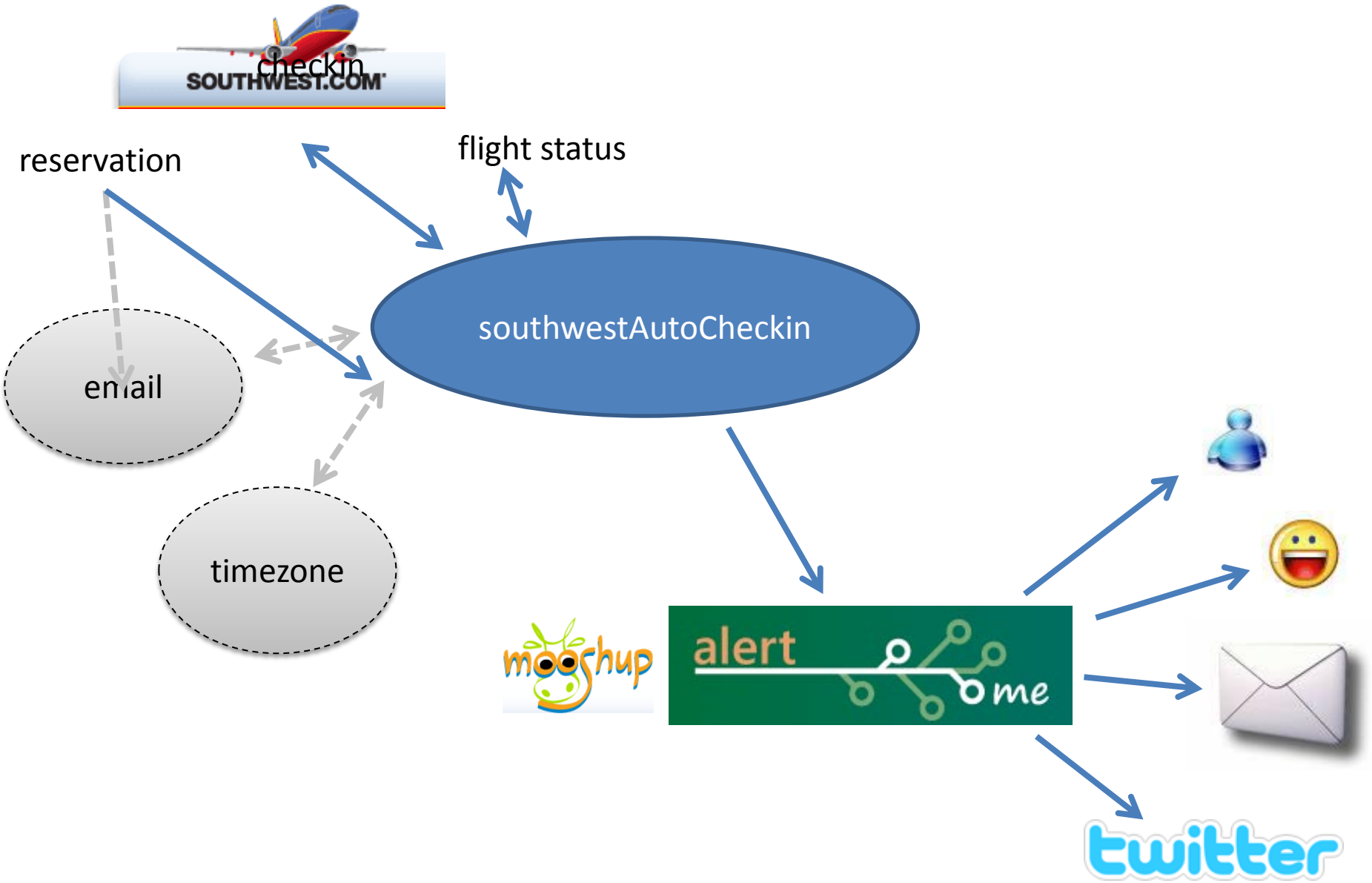
Workflow

- Register a flight
  - Provide flight details
  - Scrape confirmation email
- Provide notification information
  - Preferred channel (email, SMS, IM, Twitter…)
  - Account info (email address, phone number…)
- Schedule events
  - Access check-in page
  - Send notifications to user
  - Check flight status
  - Clean up

Services needed

- Southwest Web Site
  - Check-in
  - Flight status
- Alertme – flexible notifications
  - Twitter REST service
  - IM services (MSN, Yahoo, etc.)
  - Email
- Southwest Auto-checkin “workflow”
- Other services:
  - Airport code to timezone converter
  - Daylight savings time converter

Southwest Auto-Checkin



Mashup Lessons

- Services are not always defined by traditional “service interfaces”
- Business processes drive demand for a rich ecosystem of services
- Mashups & BPM both consume and provide services
- Development time and effort are important factors in choosing the right approach
- Governance can be a challenge (even within an organization)

Questions?