Applying Business Architecture to the Cloud

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Agenda

- What do we mean by the cloud?
- Sample architecture and cloud support
- What are the questions?
- Motivation, Capabilities, Stakeholders, Value Streams, Organization
- Portfolio Management, Risk Management
- Conclusion
Taking an Architectural Approach

- Architecture is intended to influence decisions
  - Strategic, portfolio, initiative, design, implementation, platform…

- Architects do this by
  - Collecting information, analyzing scenarios, questioning assumptions
  - Aggregating information, putting it in context, abstracting
  - Conceptualizing, Visualizing, Formalizing, Communicating

- Architectural models structure concepts and relationships to ask / answer specific questions, targeted at specific stakeholders

- What questions do we need to ask about the cloud? What architectural models will help answer them?
What is the Architecture of the Cloud?

- Everyone has their own opinion
  - …which coincidentally corresponds to their product set

- One differentiation is Public, Private, Hybrid

- Another is IaaS, PaaS, SaaS

- One perspective is that the cloud is a new ‘sourcing’ strategy

- Let’s look at an independent view
The NIST Cloud Computing Reference Architecture

Cloud Service Consumer
- Service Layer
  - SaaS
  - PaaS
  - IaaS
- Resource Abstraction and Control Layer
- Physical Resource Layer
  - Hardware
  - Facility

Cloud Service Provider
- Cloud Service Management
  - Business Support
  - Provisioning/Configuration
  - Portability/Interoperability

Cloud Auditor
- Security Audit
- Privacy Impact Audit
- Performance Audit

Cloud Broker
- Service Intermediation
- Service Aggregation
- Service Arbitrage

Cloud Carrier

Information Technology Laboratory Cloud Computing Program

Source: NIST
NIST Cloud Consumers

Example Services Available to a Cloud Consumer

Cloud Provider

SaaS Consumer

PaaS Consumer

IaaS Consumer

Information Technology Laboratory Cloud Computing Program

Source: NIST
Public, Private, Hybrid

Cloud Computing Types

What Does the Cloud Mean to You?

Virtualization
Hybrid
IaaS
SaaS ....

Finally! I don't need IT anymore. I can get everything myself in the cloud

to IT...

to Business...
View of IT Architecture

Applications, services, processes
Application Architecture

Data representations
Information Architecture

Enterprise Systems

Desktop and business systems not controlled by IT
Shadow IT Systems

Platforms and technologies
Technology Architecture

Source: ‘Business Architecture: The Art and Practice of Business Transformation’
IT System Spectrum

Where will Cloud Systems Fit?

High Risk

Shadow Systems

Low cost to procure
Unaccounted for

Redundancy
Inconsistency
Complexity

Management
Operations
Help Desk
Availability
Reliability
Scalability
Integration
Backup
DR / BCP
Security
Entitlements
Compliance
Audit
Tech. Refresh

Higher Initial Cost

Enterprise Systems

High cost to procure
Managed
Business Architecture Questions

- What business are you in?
- What external environment do you need to accommodate? (competition, regulation)
- What market position do you want to have in the future?
- What is your business operational model?
- What products and services do you need to achieve that position?
- What information and business capabilities do you need to provide and support those products and services?
- What value streams and processes enable those capabilities?
- What organizational structure will yield those capabilities?
- How will the organization be governed to achieve them?
- Which ones can we deploy or source from the cloud?
Sample Enterprise Application

Marketing

Product Catalogue

Inventory

Business Rules

Billing

Shipping

CRM
Enterprise 3.0 Application Architecture

- Performance Framework
- Data Warehouse
- Business Intelligence
- Social Media / Networks
- Dashboards
- Reports
- SaaS
- Enterprise Information Architecture
- Enterprise Business Architecture
- Enterprise Application Architecture
- Enterprise Technology Architecture
- Security Architecture
- Enterprise End-to-End Solution
- Enterprise Infrastructure
- BPM
- SOA Infrastructure
- Enterprise Tier
  - Resource Tier
  - Application Tier
  - Presentation Tier
- Enterprise Resources (ERP, data, etc.)
- Collaboration
- Users and devices
- IaaS
- RIA
- Big Data
What Should the Cloud Strategy Be?

To answer this, we first need to answer several other questions.

- How does it relate to the business strategy?
- What capabilities are involved?
- How will it affect stakeholder interactions?
- What organizational units will be involved / affected?
- What will the costs / benefits tradeoff be?
- How will we prioritize a roadmap and plan?

As an architect, how do we go about answering these questions?
Business Motivation Model
BMM Subset
Business Motivation Model Example

<<Strategy>>
Have a broad selection of products

<<Goal>>
On-line source of choice for all types of media

<<Objective>>
Offer 1,000,000 titles through 3rd parties

<<Objective>>
Enlist 1000 partners

<<Business Network>>
Partner Exchange

<<Business Service>>
DirectShip ThruPublisher

<<Tactic>>
Create an Exchange for independent use-book sellers

<<Tactic>>
Partner directly with publishers

support
implement
achieve
quantify
Business Motivation Model

- The BMM answers key business questions:
  - Why are we doing this?
  - How will we know if it’s working?

- What is the impact on our decisions with the cloud?

- Which tactics can best be implemented where?

- How will they need to integrate together?

- Will the cloud make it more or less difficult to measure success?
BA Foundational Domains

Capabilities require business information using consistent vocabulary

Capabilities are required to implement business strategies

Value Streams

Capabilities are leveraged within value streams

Organizations have capabilities

Capabilities map to these related concepts
WebGo Capability Map (Level 1)

- Strategic Planning
- Partner Relations
- Marketing
- Predictive Analysis
- Risk Management
- Innovation
- Inventory Management
- Customer Management
- Product Management
- Logistics
- Exchange Network
- IT
- HR
- Finance
- Legal

Strategic
Core
Support
WebGo Capability Model (Level 2 and 3)

Customer Management

Customer Acquisition
- Attraction
- Data Collection
- Validation

Customer Service
- Problem Resolution
- History Tracking
- Outreach

Customer Information
- Creation
- Maintain
- Remove

Customer Profiling
- Aggregation
- Analysis
- Demographics
Capability Strata

- **Strategic or Direction Setting (Top)**
  - Provide differentiation or set direction
  - Reflect executive priorities
  - Could you run these in the cloud?
  - Would you if you could?
    - What are the decision criteria?

- **Supporting (Bottom)**
  - Abilities that an organization must have to function as a business
  - Traditional targets for outsourcing
  - Cloud is a good alternative
  - Why would you *not* move these to the cloud?
    - What are the decision criteria?
Core Capabilities

- Value Add, Core (Middle)
  - The heart of what an enterprise does to ensure viability and thrive in the market
  - Can be thought of as a *customer facing* view of the business

- Which ones are critical to success?

- How comfortable are we with them in the cloud? Could we do them better ourselves?

- How do they have to work together?
  - End-to-end value streams
  - Information integration

- What are the implications?

- How do we make a decision?
Who are the Stakeholders?

- Customers interact with WebGo to find and purchase books, media, and other consumer products.
- Independent sellers interact WebGo to offer their inventory for sale through the exchange.
- Publishers interact with WebGo advertise their books and receive orders for direct delivery.
- Shippers interact with WebGo to ship selected inventory from the warehouses to customers.

Other....
Stakeholder Analysis

- The interaction with each stakeholder can be expressed in a value stream.

- There will often be more than one value stream for each stakeholder.

- Analysis of the stages of the value stream provide insight into the opportunities for new interactions via the cloud (e.g. mobile devices, social networks) and to evaluate the potential value (internal and external).

- Having identified beneficial areas for new interaction, we then identify the new capabilities that we need to support them.

- Each affected stage of the value stream may require one or more new capabilities. Of course, many of those capabilities would be common for multiple value streams and multiple stakeholders.

- For each new capability, we could identify different sourcing options. Some capabilities may be available from the cloud, some as COTS products, and others as new or enhanced implementations of existing capabilities.
Value Stream

Independence

Register for Exchange
Advertise Items
Provide order info
Process Order
Notify
Invoice

Seller Verification
Product Catalog
Selection
Order Acceptance
Notification Acceptance
Accounts Receivable
Partner Registration
Item Addition
Seller Rating
Line Item Allocation
Customer Notification
Partner Processing
XC. Member Registration
Item Availability
Shipping Calculation
PO Submission
Timeout
Payment
Value Stream

- Value Streams tell us:
  - ‘How’ things are done for a specific stakeholder and scenario
  - How different processes fit together to support a stakeholder
  - What information must be shared between processes

- ‘Stages’ of a value stream require specific capabilities

- Stages of a value stream may be implemented by processes

- Value Streams identify capabilities that are critical to the delivery of value (satisfaction) to our most important stakeholders.

- Value Streams tell us the integration requirements of capabilities, processes and information. How does this relate to our decisions about sourcing on the cloud?
Process Model – Internal Activities

- Calculate Shipping
- Determine Best Route
- Determine Best Carrier
- Determine Delivery Schedule
- Determine Price
- Format Shipping Options
Process Model – External Activities
Thanks to Razvan Radulian for the corrected model
Business Processes in the Cloud

- Move entire process to the cloud
- Source some of the tasks from the cloud
- What does that mean?
  - Loss of control
    - Collaboration versus Coordination
  - Data integration and transformation
  - Visibility
  - Activity Monitoring (BAM)
  - Auditing and Reporting
Information Map (Linked)

- Shipment
  - delivered by
  - Is for
  - sent to
- Invoice
  - pays
- Customer
  - submits
  - described by
  - contains
- Partner
  - provides
- Product
  - contains
  - recommends
- Location
  - contains
- Profile
  - informs
- Proposal
Enterprise Information Concerns

- What is the critical enterprise information?
- How is that information characterized and classified?
- What information is critical to efficient end-to-end integration?
- What information are you comfortable keeping on the cloud?
- What information are you comfortable having under the control of another business?
- How much integration / transformation will be required for consistent and efficient end-to-end interactions?
- What information semantics do you need to own?
Business Capabilities to Organizational Unit

Source: Business Architecture Guild Body of Knowledge Handbook
Organization Maps

- How will the cloud affect organization structure?
- What might a new organization structure look like?
- What will the political implications be?
- Do the organizations have the skills to source via the cloud and manage those apps?
- How do you avoid silos and redundancies?
## IT Portfolio Scorecard

<table>
<thead>
<tr>
<th>Application Name</th>
<th>Factor 1 Alignment to IT Strategic Intentions</th>
<th>Factor 2 Alignment to Business Strategic Intentions</th>
<th>Factor 3 Risk</th>
<th>Factor 4 Service Level and Quality</th>
<th>Factor 5 Annual Application Cost</th>
<th>Factor 6 The Extent to which the Application is Used</th>
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### Application Impact Indexes
- **Maximum IT Impact Index (100)**
- **Maximum Business Impact Index (100)**
- **Security Risk Max (100)**
- **Technical Risk Max (100)**
- **Service Level Max (100)**
- **Quality Max (100)**
- **Annual Cost Index (100)**

### Additional Information
- **Annual Cost (000)**
- **Computing - Data Center**
- **Computing - Local**
- **Maintenance**
- **License / Contracts**
- **Dependency**
- **Breadth**

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Issues with the Cloud

- Availability / Reliability
- Security
- Incident Management
- Accountability
- Semantics
- Integration
- Regulatory Compliance
- Visibility
Lock-in and Interoperability

- What happens if you want to move to a different Cloud provider?
  - Mergers and Acquisitions
  - Out of business
  - Poor performance (cost, SLA, technical)

- Can you move to a new platform?
  - What level of features / functions have you used?
  - Is everything assessable through an API?
  - Are industry standards followed? Do they exist?

- What about your data?
  - Can I get my data out at all?
  - How much is it going to cost to get my data out?
  - How much of my time is it going to take to get my data out?

- Cloud relationships will come to an end. Have an exit strategy!
Cost Benefit Analysis

- Let’s review what we’ve done.
  - We identified the overall set of stakeholders that could be affected by a cloud strategy.
  - Then, we examined opportunities to add value with the cloud, across all stakeholders and scenarios.
  - Finally, we identified the capabilities that would be required to provide the complete scenario, and where those capabilities could be leveraged to maximize their value.

- Now, we are able to do a cost benefit analysis.
  - For each new interaction, there is potential benefit, and cost. We must understand both to perform a realistic evaluation.
  - At the same time, the cost is shared across multiple different value streams, and if we don’t understand this, we will be evaluating the tradeoff incorrectly.
  - Business architectural enables better decisions about what should and should not be part of the cloud strategy, and how to measure the results to see if the strategy is delivering the expected value.

- We can also prioritize the new capabilities based on dependencies, how often they are used, and what scenarios they support.
## Business Decision Matrix

This table summarizes the business architecture issues associated with cloud services.

<table>
<thead>
<tr>
<th>Business Model</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| Capability          | **Support – YES; Strategic – NO**  
| Information         | Security, availability, reliability, BCP? Semantics?                                                                                             |
| Motivation          | What tactics can be implemented in the cloud?                                                                                                     |
| Value Streams       | What information needs to be shard? What processes need to work together?                                                                         |
| Processes           | Can the whole process be deployed in the cloud? Can individual tasks? What is the Impact on: Control, integration, visibility, BAM, auditing, reporting. |
| Organization        | Organizational structure, politics? Skills to manage?                                                                                              |
Summary

- The cloud is not coming…it’s already here
- Business will use the cloud whether you like it or not
- Help to evaluate the cloud on business terms
- Get in front of the cloud! Be ready with guidelines, standards, and architectural services
- Position the cloud to provide value and agility and reduce costs. Not to provide complexity, risk and increased integration
- Integrate cloud services into your Business Architecture
Questions?