TIM158
Business Information Strategy

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To maintain consistency.
Lectures throughout TIM158 adapted or borrowed from Kevin Ross.
Additional material added as needed.
Lecture 13

Chapter 7

Managing IT Service Delivery
1. Understand how internetworking enables new IT service models and recognize typical features and advantages of these new models

2. Understand the opportunities and challenges of incremental outsourcing

3. Understand the value of large-scale outsourcing and how these complex alliances can best be managed
Old Business Model

Each company develops own infrastructure for communication with customers and partners
  – Duplication
  – Lack of interoperability
  – Required separate software simply to convert between incompatible systems
  – Proprietary systems locked in relationships over a long term, removing bargaining power
Business Model with Internet

- Open standards of communication
- Leverage work done by others
- Shared infrastructure with partners
- Bridging software simple, cheap
- Less locking of partnerships
- Services can come from separate providers instead of IT departments
- Incremental services instead of large commitments
- Virtual integration of partners
- Service Level Agreements
New Service Models

• Client-server computing
  – Locally stored documents, software
• High capacity networks allow software, servers, storage to be distant from users
• Not every company needs every specialization of IT capability
• Develop new capabilities quickly, reducing time to market
• Shift to 24-7 operations
• Smoother cash-flow (see fig)
Fig 7.1 Purchase vs subscribe cashflow

CUTOVER

Benefits Begin to Trend Up
(if project is successful)

Costs Stabilize at Maintenance Level

PURCHASE

Purchase and Installation

• Buy software
• Hire consultants
• Install and test

SUBSCRIBE

Immediate Benefits (infrastructure already in place)

Start-up Fee

Subscription Fees

Time

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New Service Models ctd.

- **Cost reduction**
  - Centralization of updates
  - Eliminated need for specialized support
  - Less vulnerable points of security breach
  - Economies of scale

- **Global accessibility**
  - Physical location
  - Device
Web Services Model

• Online, automated negotiation for service
• Currency conversion example
RESTful API (6 constraints)

- Client–server
- Stateless
- Cacheable
- Layered system
- Code on demand (optional)
- Uniform interface

Representational state transfer
Grid/On Demand/Utility Computing

• Reconfiguration online of resources
• Web-enabled contracts
• Sharing of resources
• Requires
  – Short term, simple contracts
  – Restructuring of existing applications
  – Advanced infrastructure
• Middleware to manage
  – Provisioning
  – Resource virtualization
  – Change Management
  – Performance Monitoring
• See fig 7.2
Fig 7.2(a) On Demand Computing Environment
Fig 7.2(b) On-Demand Computing

<table>
<thead>
<tr>
<th><strong>IBM—Computing Portfolio</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server Farms</strong></td>
<td>BladeCenter on Intel (Win/Linux/Netware); xSeries on Intel (Linux/Win/Netware); Midrange iSeries (OS400/Linux); pSeries on IBM power4+ processors (AIX/Linux); zSeries MainFrames (z/OS/Linux); 32/64 bit Servers on AMD Opteron (Linux)</td>
</tr>
<tr>
<td><strong>Storage Farms</strong></td>
<td>IBM TotalStorageDisks/Tapes/SAN/NAS H/W</td>
</tr>
<tr>
<td><strong>Network Resources</strong></td>
<td>Use of third-party products (e.g., Cisco, Juniper)</td>
</tr>
</tbody>
</table>
| **Server Virtualization/App Provisioning** | Purchased ThinkDynamics (5/03=$undisclosed)
Tivoli Configuration/Provisioning Mgr |
| **Storage Mgmt**           | IBM TotalStorage SAN F/S & SAN Vol Controller
Tivoli Storage Manager |
| **Network Mgmt**           | Tivoli NetView for network provisioning                       |
| **Systems Mgmt**           | Tivoli Suite for Managing Multiple Platforms: Access Mgr,
Systems Discovery, Provisioning, Monitoring, Reporting |
| **Higher Level Web Services Apps** | Websphere ebusiness products, Rational (12/02 = $2bn) dev tools, Lotus collaboration products, DB2 database |
Risk Management

• Which services should we outsource?
  – Generic processes that others can do better
  – Commodities
  – Not core capability or competitive advantages

• Incremental service outsourcing is smaller scale and more reversible than production outsourcing
Fig 7.3 Outsourcing Decisions

1. Does service offer competitive advantage?
   - Yes: Proceed to next question.
   - No: Keep internal.

2. Is external delivery reliable and lower cost?
   - Yes: Outsource.
   - No: Keep internal.
Incremental Outsourcing: Hosting

- House computers for net services
- Service levels
  - Collocation hosting
  - Shared hosting
  - Dedicated hosting
- Different level of services available
  - See table 7.1
<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business operating services</td>
<td>Administering and operating an application</td>
</tr>
<tr>
<td>Application support services</td>
<td>Support for software above the operating system level; application support; application performance monitoring and tuning; design of applications for scalability, reliability, security</td>
</tr>
<tr>
<td>Platform services</td>
<td>Support for hardware, operating system; reboot services; data backup and disaster recovery services; URL monitoring</td>
</tr>
<tr>
<td>Network services</td>
<td>Connectivity within the facility and externally to the public Internet and to private peering networks; monitoring of network traffic at the transport layer; service-level assurances at the packet loss and network availability layers; network security</td>
</tr>
<tr>
<td>Real estate services (lowest level)</td>
<td>Suitable floor space and physical facilities; maintenance of the space and facilities</td>
</tr>
</tbody>
</table>
Relationship Management

• Trust is extremely important
• Often put out a RFP (Request for Proposal)
• Look for
  – Descriptive Information
  – Financial Information
  – Proposed plan for meeting requirements
  – Mitigation of critical risks
  – Service guarantees
  – Pricing
Exercise

• Look at tables 7.2, 7.3 and make a recommendation of selection for one service provider out of the three offered
<table>
<thead>
<tr>
<th>Comparison Dimension</th>
<th>Provider 1</th>
<th>Provider 2</th>
<th>Provider 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company description</td>
<td>Regional hosting and broadband (backbone, DSL service provider)</td>
<td>National hosting services provider</td>
<td>Regional telco, backbone and broadband service provider</td>
</tr>
<tr>
<td>Employees</td>
<td>1,600</td>
<td>3,300</td>
<td>28,000</td>
</tr>
<tr>
<td>Financial profile</td>
<td>Declined to provide (private company)</td>
<td>After-tax loss $180 million on sales of $600 million; strong cash position; new facilities building offered as explanation for lack of profitability</td>
<td>After-tax profit of $1.1 billion on sales of $13 billion (most not from hosting business)</td>
</tr>
<tr>
<td>Number of data centers managed/total square feet</td>
<td>3 data centers/160,000 sq. ft.</td>
<td>28 data centers/1.6 million sq. ft.</td>
<td>5 (2 operational)/220,000 sq. ft. (45,000 operational)</td>
</tr>
<tr>
<td>Space offered (RFP specified space for six racks of equipment)</td>
<td>3’8”×8’ cages (192 sq. ft.), partitions removed to provide contiguous space</td>
<td>3’8”×7’ cages (168 sq. ft.), partitions removed to provide contiguous space</td>
<td>280 sq. ft. enclosed room</td>
</tr>
<tr>
<td>Physical security</td>
<td>Fully meets requirement</td>
<td>Fully meets requirement</td>
<td>Some concerns (see notes from site visit)</td>
</tr>
<tr>
<td>Power</td>
<td>Fully meets requirement</td>
<td>Fully meets requirement</td>
<td>Connected to only one power grid; two promised within 6 weeks</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Fully meets requirement</td>
<td>Fully meets requirement</td>
<td>Not redundant to backbone; promised redundancy in 6 weeks</td>
</tr>
<tr>
<td>Service-level guarantees</td>
<td>Fully meets requirement</td>
<td>Fully meets requirement</td>
<td>Partially meets requirement</td>
</tr>
<tr>
<td>One-time setup cost, space</td>
<td>$6,500</td>
<td>$7,800</td>
<td>$10,800</td>
</tr>
<tr>
<td>Monthly space rental</td>
<td>3 × $6,500</td>
<td>3 × $6,800</td>
<td>$9,800</td>
</tr>
<tr>
<td>One-time setup cost, connectivity</td>
<td>$1,200</td>
<td>$1,500</td>
<td>$1,600</td>
</tr>
<tr>
<td>Variable connectivity cost</td>
<td>$1,200 per month plus $525 per month for each mbps above 10</td>
<td>$1,500 per month plus $589 per month for each mbps above 10</td>
<td>$900 per month plus $412 per month for each mbps above 10</td>
</tr>
</tbody>
</table>

Source: Adapted from Robert D. Austin, "Selecting a Hosting Provider," Harvard Business School Exercise No. 601-171. Although based on real cases, these data are fictitious and do not pertain to any real hosting provider.
TABLE 7.3 Sample Facility Visit Report for Hosting Provider 3

Source: Robert D. Austin, "Selecting a Hosting Provider," Harvard Business School Exercise No. 601-171. Information in this report is fictitious and not intended to pertain to a real hosting provider.

| Initial walk around exterior: | Renovated warehouse building (conventional brick, not hardened) shared with a delivery service. Urban setting amid a complex of warehouses. City workers doing roadwork near the facility, with heavy-duty digging (potentially fiber cable slicing) equipment. Data center on third floor. First floor and basement include a garage used by the delivery service. Panel trucks come and go on the lower levels on the north side. Second floor includes offices and appears to be empty. Never spoke to anyone who could tell us definitively how the second floor would be built out or if even that was the plan. CCTV cameras visible around the perimeter of the facility. Diesel generators enclosed in 12-foot-high chain link, HVAC on roof. West side of building composed of a series of loading doors. On day of visit, three loading doors were open. We succeeded in climbing up onto the loading dock and walking right into a power infrastructure room where many UPSs were housed. Waited there, expecting CCTV or alarm to summon security; no one ever showed up. (Staff later explained this lapse by saying that the door was open to facilitate construction and renovation and that the guard who was posted there had been reprimanded.) |
| Entering facility: | First-level security is building security. Guard appeared not to realize that there was a data center in the building. Ushered us up to the third floor, where we encountered an unoccupied security desk behind a sliding glass partition. One CCTV console visible at desk. It would have been easy to climb through the opening to the security desk and let ourselves into the facility. Biometric palm reader visible but dust-covered at door. Security guard who had walked us up called someone on radio, and someone came to let us in. Person who let us in came from somewhere outside the data facility, then let us in by leaning through the opening and hitting the buzzer, which was in reach. We stood inside the door while he made out visitor badges for us. He did ask to see picture IDs, but security was kind of a farce by this point and everyone was a little embarrassed (including us for them). The room we were standing in while he prepared badges approximated a man trap in that there was another door about 20 feet away that opened into the data center proper. Unfortunately, that door was propped open. |
| Cages: | No cages. Everyone gets an enclosed room with keypad access. No raised floor; power comes in from above, as do comms. Bolt-in racks and shelves provided. Walls of rooms do not extend to roof, so possible to climb over walls or to toss something into enclosed room. |
| Verification of redundancy, security, etc.: | Redundant power and connectivity not yet in place, although promised within six weeks. Network hardware for facility was exposed in an open area anyone walking to his or her own enclosed space would need to pass. No on-site NOC, although they expressed willingness to provide specific network monitoring on site on a contract basis; noted too that network operations were monitored from a regional NOC. Guy giving tour kept apologizing for the construction. |
| Concerns: | This facility is not fully built yet, although some customers are operational. Provider promises to have it in shape in time consistent with our project, but fact is that we cannot compare this facility on an equal basis with the others. Facility being under construction did not explain all the lapses we saw. |
| Overall assessment: | These guys don’t appear to have the hosting business figured out yet. Maybe it’s just that they are in a construction phase. But there was little that we saw that offered warm feelings during our tour. |
Service Level Agreements (SLAs)

- **SLA information**
- Align incentives in relationships
- Careful definitions
- Penalties – large or small – for failure to provide
- Trusting with data
  - Clear who owns it
- See table 7.4
Table 7.4 Sample SLA

| Downtime—defined as sustained packet loss in excess of 50 percent for 15 consecutive minutes due to the failure of the hosting provider to provide services for that period (does not include scheduled maintenance time). |
| Excess latency—defined as transmission latency in excess of 120 milliseconds round-trip time between any two points within the hosting provider’s U.S. network. |
| Excess packet loss—defined as packet loss in excess of 1 percent between any two points in the hosting provider’s network. |
| Each downtime period entitles customer to receive a credit equal to one day’s recurring connectivity charge. |
| Hosting provider guarantees two-hour response time in diagnosing problems within hosting provider and customer network. |
| If problem is not within hosting provider and customer network, hosting provider will determine source within an additional two hours. |
| Customer will be advised of reason for problem within one hour of hosting provider’s discovery of the reason for the problem. |
| If problem is within control of hosting provider, remedy for problem is guaranteed in two hours from diagnosis of the problem. |
| Inability to deliver diagnosis or remedies within the times stated above entitles customer to an additional service credit for each two-hour period of delay. |
| Customer can collect credits for no more than seven days’ charges in a calendar month. |
| Customer must request credits in writing within seven days of the event for which credits are compensation. |
| Credits are granted at the sole discretion of the hosting provider. |
Large Scale Outsourcing

E.g. 10 year contract to manage majority of IT

• Often motivated by
  – Cost savings
  – Dissatisfaction with existing IT capabilities
  – Desire to focus firm strategy elsewhere
  – Major organizational change
  – Access to skill and talent
  – Financial arrangements
Designing Large-scale outsourcing alliances

- Contract flexibility
- Standards and control
- Scope
- Cost savings
- Rate of technology renewal and improvement

Management issues
- CIO
- Performance Management
- Relationship interface
Legacy Management

• Typical challenges
  – Technology
  – Residual Process complexity
  – Local Adaptation
  – Nonstandard data definitions

• Adding interfaces called enterprise application integration (EAI)

• Work-around solutions tend to grow in complexity

• See table 7.5
### Table 7.5 Key Questions in Managing Legacies

<table>
<thead>
<tr>
<th>Legacy systems</th>
<th>How will new infrastructure exchange data with legacy systems?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Will new infrastructure obtain needed real-time interaction with legacy systems?</td>
</tr>
<tr>
<td></td>
<td>What work-arounds are necessary? Are they sustainable?</td>
</tr>
<tr>
<td></td>
<td>What is long-term strategy for renewing legacy systems?</td>
</tr>
<tr>
<td>Legacy organizations and cultures</td>
<td>How will new infrastructure affect ways of working and communicating? Are anticipated changes acceptable?</td>
</tr>
<tr>
<td></td>
<td>Should technology drive organizational and cultural change?</td>
</tr>
<tr>
<td></td>
<td>Should organization and culture be protected from technology effects?</td>
</tr>
<tr>
<td></td>
<td>What are organizational expectations about common processes in different parts of the organization?</td>
</tr>
<tr>
<td></td>
<td>What are criteria for deciding whether systems or process will change when the two are not compatible?</td>
</tr>
</tbody>
</table>
Managing infrastructure Assets

• Difficulty to recognize who is using what machine etc.
• Need to know if assets are used efficiently, if they are being used across business lines, etc.
• Total Cost Ownership (TCO)
  – IT services measured in terms of measured costs and benefits
  – Per use or time dedicated
  – Theoretically efficient, but can be cumbersome and lead to wrong valuation and incentives
MIT Study on Infrastructure

• 180 business initiatives
• 118 businesses in 89 enterprises
• 4.2% of revenue spent on IT
• 50% of capital budget
• 55% of IT budget goes toward fusion of technology, processes and human assets
Findings

• Leading companies used incremental modular steps rather than a few large investments

• Service level agreements become more stable in better companies

• Variety of classes of service that make up infrastructure
Findings: Clusters of IT-infrastructure services

- Channel-management
- Security and Risk-management
- Communication
- Data-management
- Application-infrastructure
- IT-facilities-management
- IT-management
- IT-architecture-and-standards
- IT-education
- IT R&D
Findings: Matching Capabilities to Strategic Direction

• Found significant correlation between strategic agility and IT-infrastructure capability

• Three major categories of initiatives:
  – Internally focused (51%)
  – Demand side: Links to Customers (55%)
  – Supply side: links to suppliers (76%)

• 56% of initiatives covered at least two, and 26% covered all three
Classifying Initiatives

• Position on value net (suppliers/buyers/internal)
  – Technology enables communication and drops transaction costs

• Type of exchange (B2B or B2C)
  – B2B involves small, focused customer set with large transaction volume per customer
  – B2C large no. of individual customers with less transactions per customer
  – Both require significant data

• Type of innovation: products or markets?
Critical Capabilities

• Supply-side
  – Business-unit level decisions required different systems

• Internally-focused
  – Broadly enforced standards, but business-unit specific IT

• Demand-side
  – Rely heavily on enterprise-wide architecture
  – (note conflict with above – data best at enterprise level)

• Critical to Exchange Type
  – B2B at business-unit level
  – B2C centrally managed

• Innovation Type
  – New products have local management
  – New market require centralized
Investing in IT for strategic agility

• Requires time, money and focus
• Under-investing reduces agility, slows time to market
• Over-investing wastes resources
• Like buying an option
• Critical for senior executives to understand which IT-infrastructure is required for what initiatives