MIS 3534 Spring 2015 – Strategic Management of Information Technology
Week 4 – Business Value of IT

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Today, we will discuss …

● How to justify a substantial amount of IT spending in an organization?

● What kind of business value can IT generate for a business organization?

How Much are e*Logistics and ByRequest?

● Try to guess – How much do you think Otis and Wyndham have spend in e*Logistics and ByRequest?

● How can we *justify* such a large amount of investments?

● As a CIO, how would you answer this question from your bosses – *why do we have to throw that much money*?

http://bluegrasstoday.com/gangstagrass-on-justified-tonight/

Physical Security Management at Airport (1/2)

- Why is security a concern at an airport?

- Which individuals should an airport manage for security?

  - everyone who works at the airport

  - airport employees, retail employees, airline employees, government officials, contractors, and others
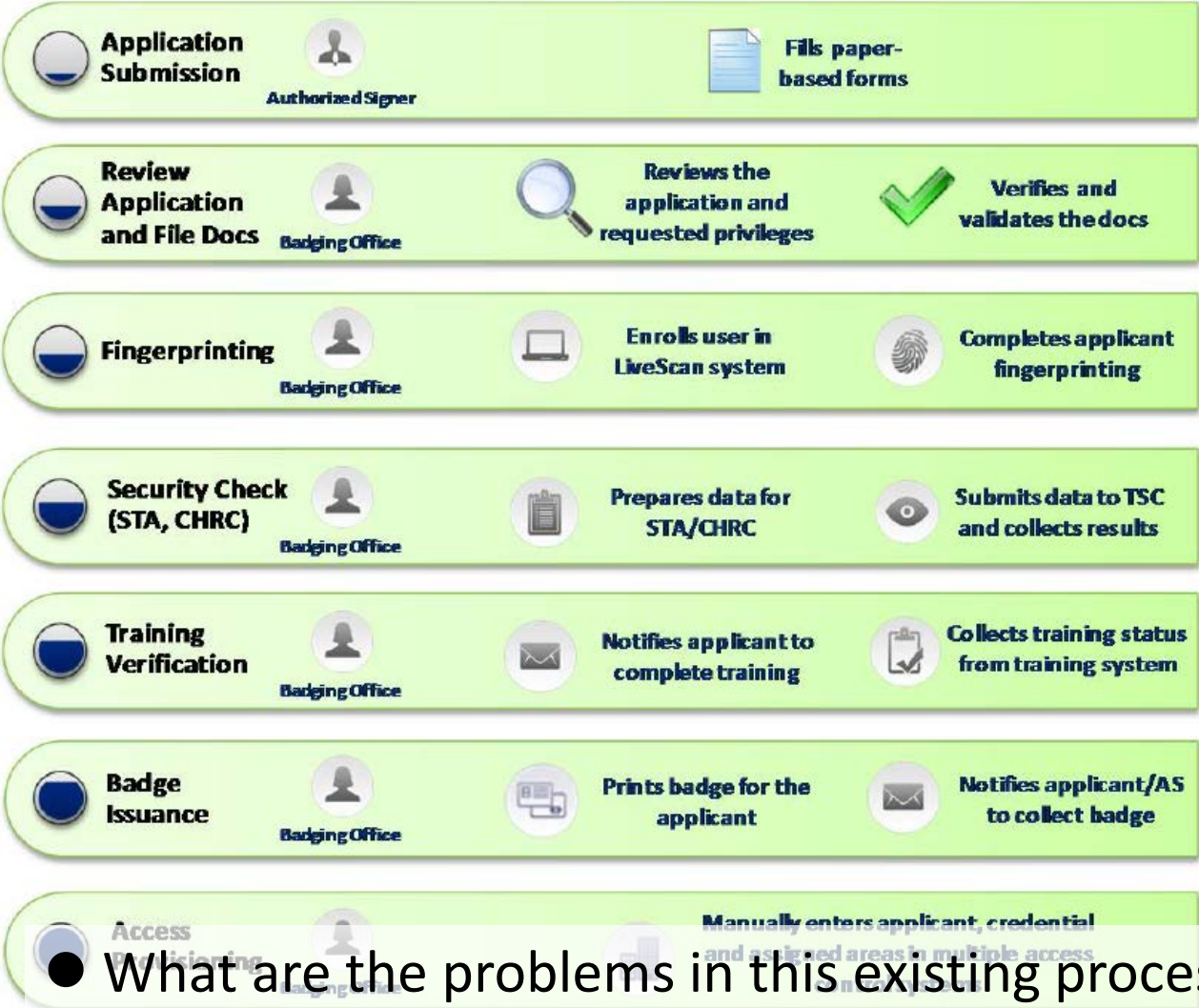
Physical Security Management at Airport (2/2)

- Which information does a security system have to maintain?

  - Personnel information

  - Security clearance information (who can enter where and can do what?)

- Which process does the security system have to handle?

  - Adding, deleting, and updating personnel and clearance information

  - Information exchange with external systems

  - Tracking and auditing

Current SFO Security Management Process
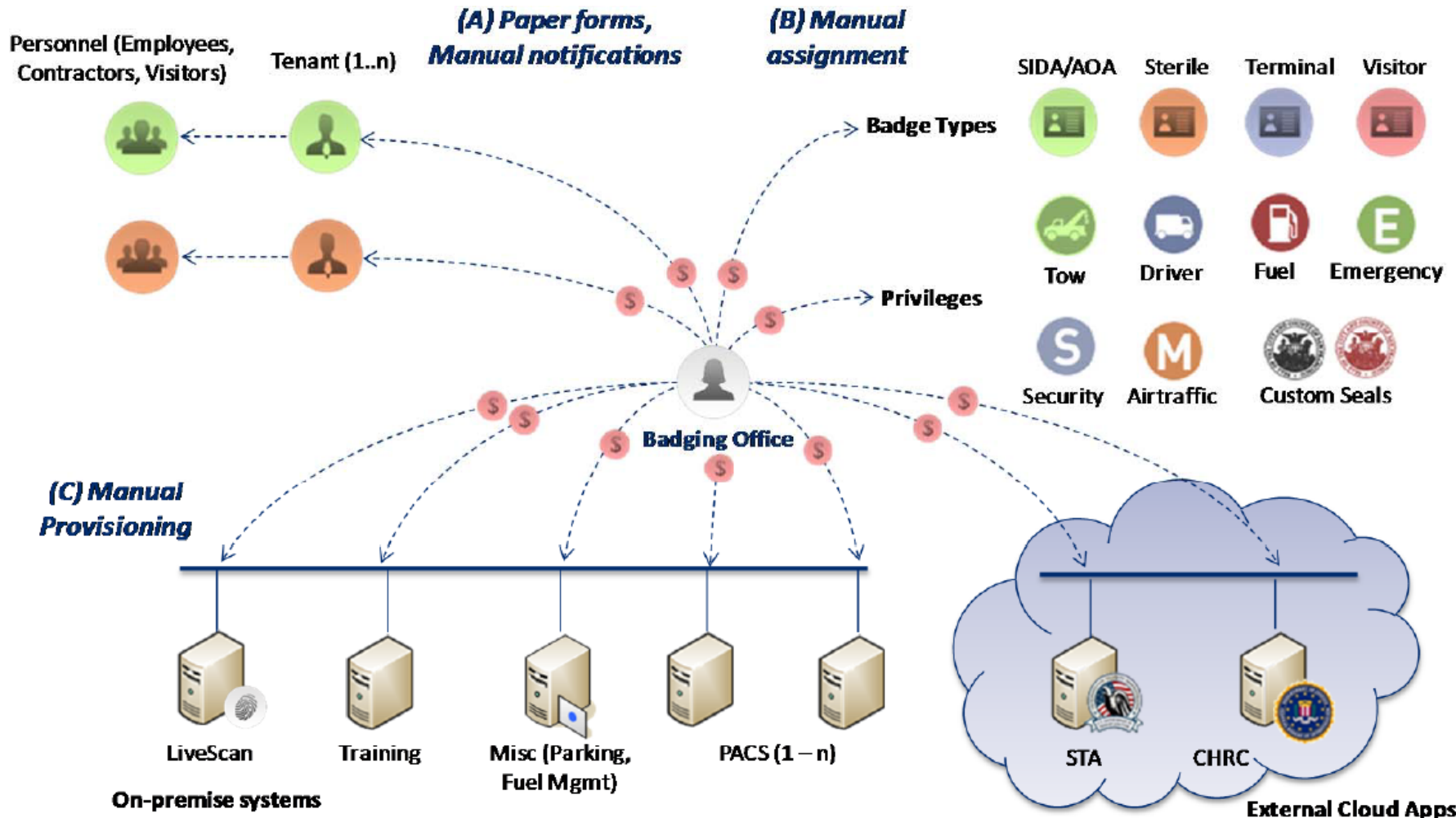
Manual processes currently implemented through paper-based forms and through multiple systems

Application Submission — Authorized Signer — Fills paper-based forms

Review Application and File Docs — Badging Office — Reviews the application and requested privileges — Verifies and validates the docs

Fingerprinting — Badging Office — Enrolls user in LiveScan system — Completes applicant fingerprinting

Security Check (STA, CHRC) — Badging Office — Prepares data for STA/CHRC — Submits data to TSC and collects results

Training Verification — Badging Office — Notifies applicant to complete training — Collects training status from training system

Badge Issuance — Badging Office — Prints badge for the applicant — Notifies applicant/AS to collect badge

Access Provisioning — Badging Office — Manually enters applicant, credential and assigned areas in multiple access

Problems list (right column):
- Data entry errors

- Data re-entry, Manual verification
- Duplicate records
- Limited tracking/audit
- Delays

- Data re-entry
- Data entry errors

- Data re-entry, Manual verification of results
- Manual determination of required clearances

- Manual notifications and delays
- Manual verification of results

- Manual notifications, delays and applicant authentication
- Manual check of pre-requisites completion

- Data entry errors – unauthorized access
- Data re-entry into multiple PACS

● What are the problems in this existing process?

Risk in the Current Security System (1/3)

● What are the risks in the current security system at SFO?

● What are the risks from the current manual, inefficient processes in managing airport employee credentials?

- in adding a new employee?

- in updating employee credentials?

- in deleting an employee who resigned or was dismissed?

- An employee who was fired might still carry badges after he/she was dismissed.

Risk in the Current Security System (2/3)

The disjointed execution of these processes—which were often conducted out of sequence and required additional resources for correction—undermined airports' operational efficiency. (See **Exhibits 1** and **2**.) For example, one large international airport took three weeks to register an employee in the parking, payroll, human resources, and PACS databases. "You'd go stand in this huge line, and you'd get to the front of the line, and they would say, 'This isn't right, come back Tuesday to fill out new forms,'" said Ajay Jain, president and CEO of Quantum Secure, a provider of enterprise-wide security software solutions. "The wait was so long that people were starting to leave and just abandon these job offers, thereby creating heavy strain on airport operations."[3]

The challenges did not end once a new employee was registered in the systems—any changes to access permissions required that a massive spreadsheet be printed and compared to the list used at an access point to identify any additions, deletions, or modifications. This inefficient, highly manual, and error-prone process had been the status quo in the physical access control world for decades, but development of comprehensive software solutions offered the prospect of integrating and streamlining existing procedures.

Risk in the Current Security System (3/3)

- What could be the *WORST-CASE* scenarios?

  - An airplane crash with massive casualties

  - Another 9-11

  - How likely is it?

  - Can we ignore it? Can't we just say "that's not gonna happen"?

  - Can we prevent all possible scenarios?

Net Present Value (NPV)

● The sum of the present values of net cash flows in multiple periods up to time T

$$NPV = \sum_{t=0}^{T} \frac{R_t - P_t}{(1+i)^t}$$

● R_t : Cash inflows or savings at time t

● P_t : Cash outflows (payments) at time t

● i : the discount rate (an inflation rate, cost of capital, or an interest rate that the firm pays)

● Reject the project if $NPV < 0$

Internal Rate of Return

● The discount rate (i) in which the net present value is equal to zero
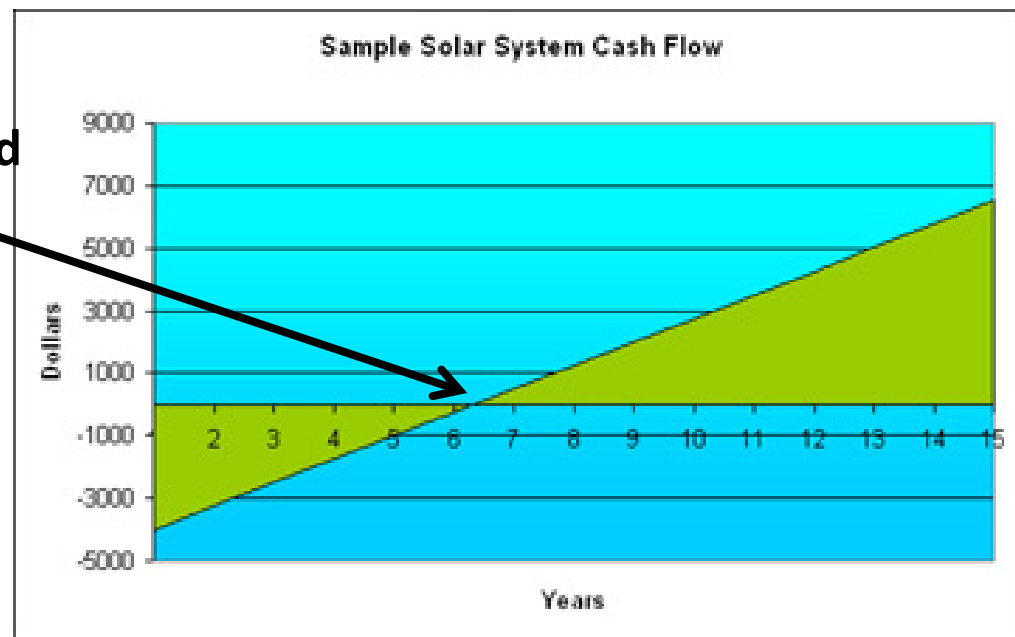
$$NPV = \sum_{t=0}^{T} \frac{R_t - P_t}{(1+i)^t} = 0$$

● Reject the project if IRR is lower than the cost of capital

  ▪ meaning that it is better to make investments in other projects

● Help compare returns from multiple investment projects

Payback Period (1/2)

● The time at which cash inflows or savings recoup the entire of initial investments

● The time at which cumulative cash inflows or savings exceed the initial investments

Payback Period = 6.3 years

Sample Solar System Cash Flow

https://www.extension.iastate.edu/AgDM/wholefarm/html/c5-240.html

Payback Period (2/2)

Table 1. Payback Period Analysis of Future Cash Flow Payments for Three Capital Projects

Year	Project A Cash Flow	Cumulative	Project B Cash Flow	Cumulative	Project C Cash Flow	Cumulative
0	-$1,000		-$1,000		-$1,000	
1	$250	$250	$350	$350	$500	$500
2	$250	$500	$350	$700	$500	$1,000
3	$250	$750	$350	$1,050	$500	$1,500
4	$250	$1,000	$350	$1,400		
5	$250	$1,250	$350	$1,750		
6	$250	$1,500				
7	$250	$1,750				
8	$250	$2,000				
9	$250	$2,250				
10	$250	$2,500				

Payback Period Comparison

Project	Payback Period	Cash Return
A	4 yrs.	$2,500
B	3 (2.86) yrs.	$1,750
C	2 yrs.	$1,500

$$= 2 + \frac{1,000 - 700}{1,050 - 700} = 2.86$$

https://www.extension.iastate.edu/AgDM/wholefarm/html/c5-240.html

Your Recommendation

● What is your recommendation? Go ahead with this or not?

● How *certain* are you?

■ Are you certain that everything will pan out as predicted?

● Which assumption or prediction is most sensitive (critical)?
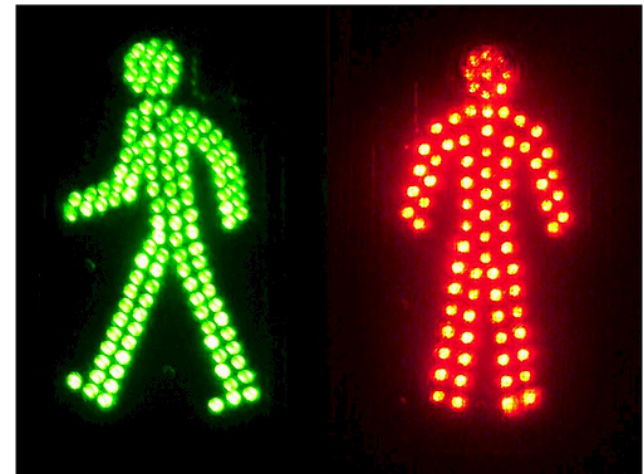
Sensitivity Analysis

● A ROI analysis hinges on a number of assumptions and predictions.

  ■ e.g. The number of new users will increase by 10% annually, or the required man-hours for record-keeping will be reduced by 88%.

● There is no guarantee that all the assumptions will be correct.

● Sensitivity analysis: How would predicted returns (NPV, IRR) change when one or more assumed parameters change?

  ■ to find out to which assumption the predicted returns are most sensitive.

Problems with ROI Analysis

● What would be the problems with the ROI analysis we just did?

- ■ What does this fail to account for?

- ■ Intangible (hard-to-quantifiable) benefits and costs

Intangible or unexpected costs

- What would be intangible (hard-to-quantify) costs?

  - Employee training and adjustment, work disruption

  - Costs in maintaining old and new systems concurrently

- What would be unexpected costs that we need to be mindful?

  - Project delays and cost overrun, system failures

  - Resistance of employees to accept the new system

  - Unidentified security risk in the new system

http://maverickinvestors.com/2013/07/30/earnings-surprises-impotent-earnings-shocks-potent/
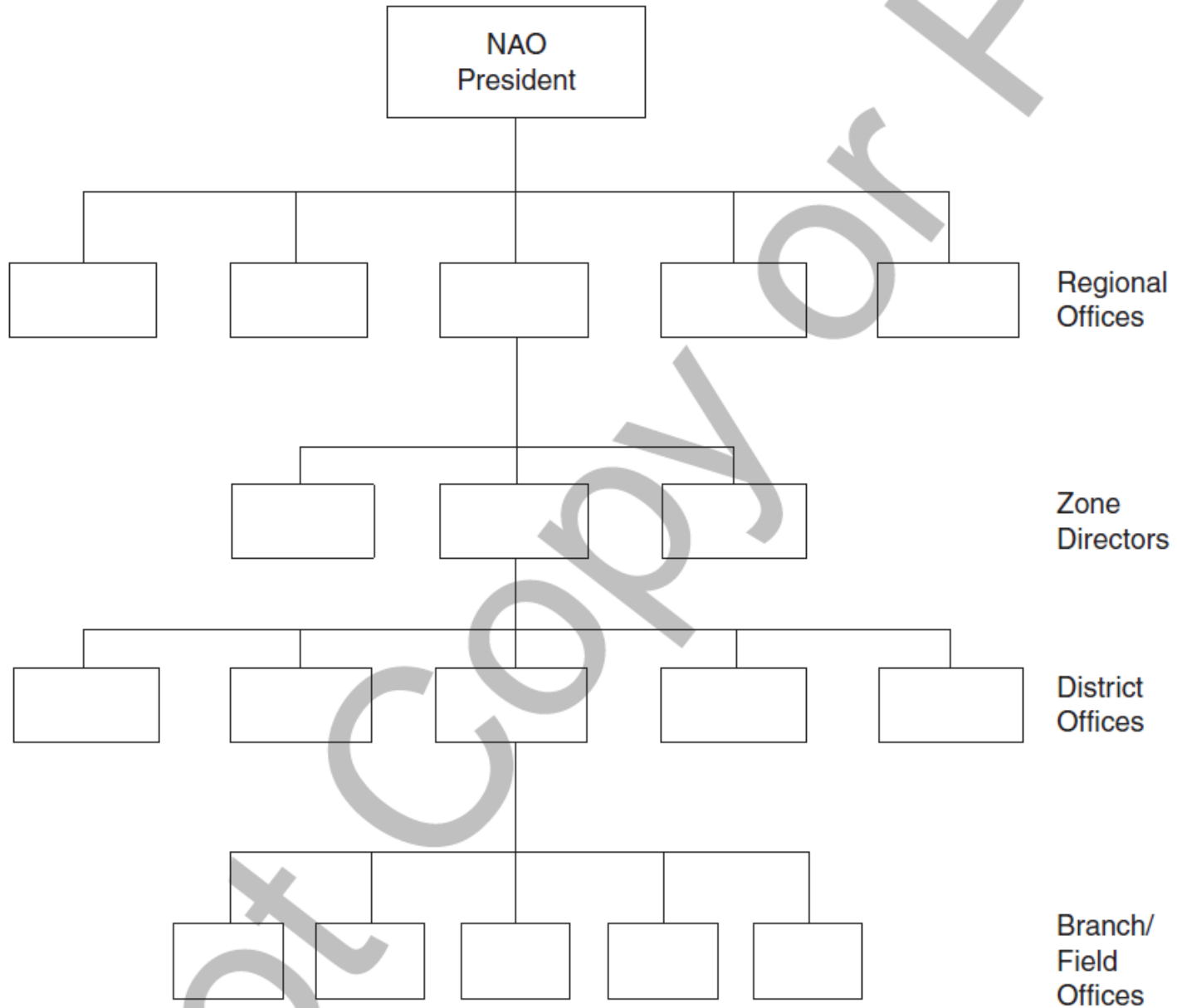
Intangible (Soft) benefits

● What would be intangible (hard-to-quantify) benefits?

● How would you quantify benefits from *increased compliance*? Based on what?

● How would you quantify benefits from *reduced security risks*?

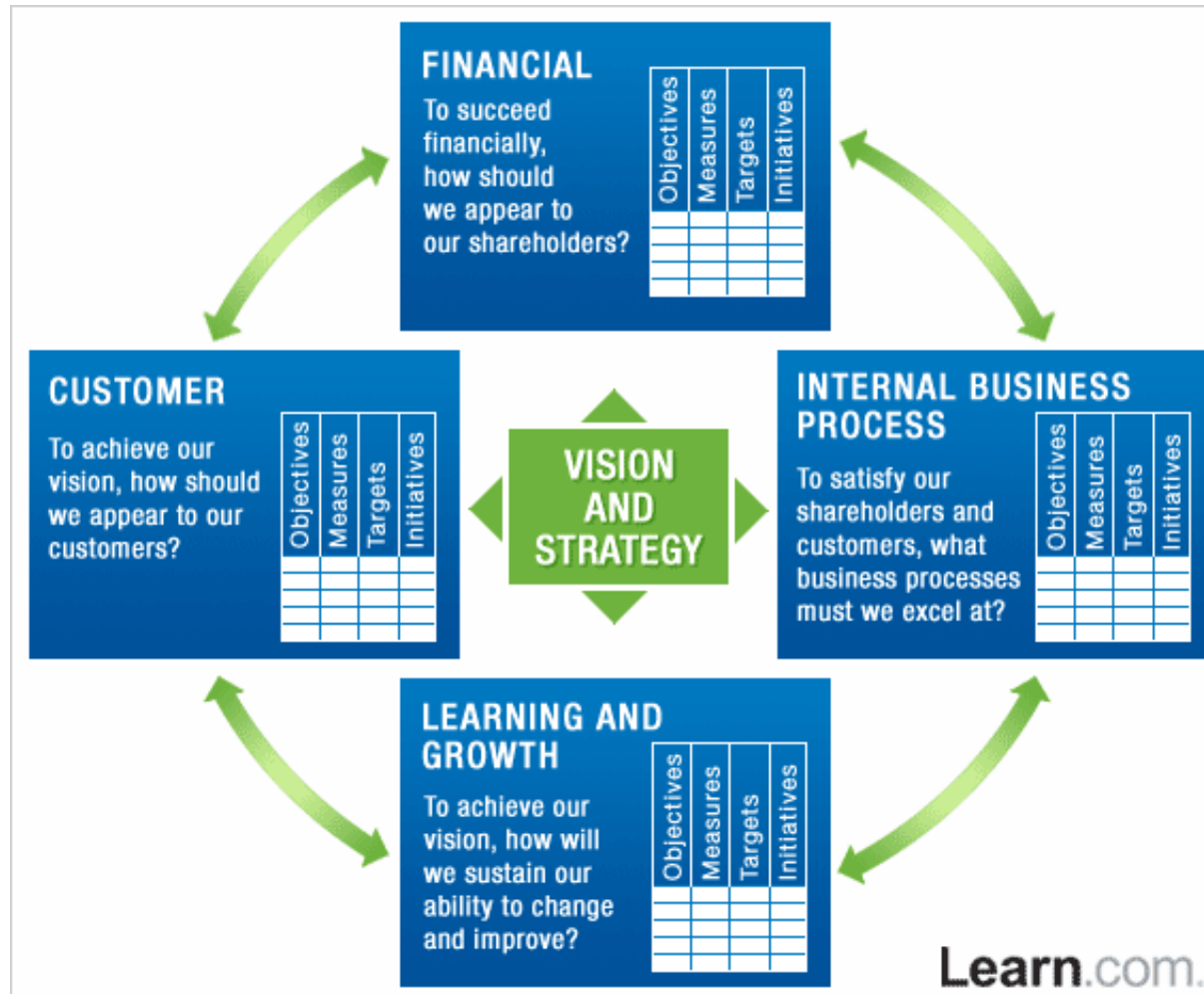● How would you make your numbers believable to your bosses?

http://sourcesofinsight.com/quantification/

Intangible (Soft) benefits from OTISLINE

● What would be the intangible (hard-to-quantify) benefits from OTISLINE?

● How to categorize them?

http://sourcesofinsight.com/quantification/

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                          NAO
                        President
                           │
   ┌───────┬───────┬───────┼───────┬───────┐
 [     ] [     ] [     ]   [     ] [     ]   Regional
                                            Offices

                  ┌───────┬───────┐
                [     ] [     ] [     ]      Zone
                                            Directors

        ┌───────┬───────┬───────┬───────┐
      [     ] [     ] [     ] [     ] [     ]  District
                                              Offices

              ┌───────┬───────┐
            [   ] [   ] [   ] [   ]           Branch/
                                             Field
                                             Offices
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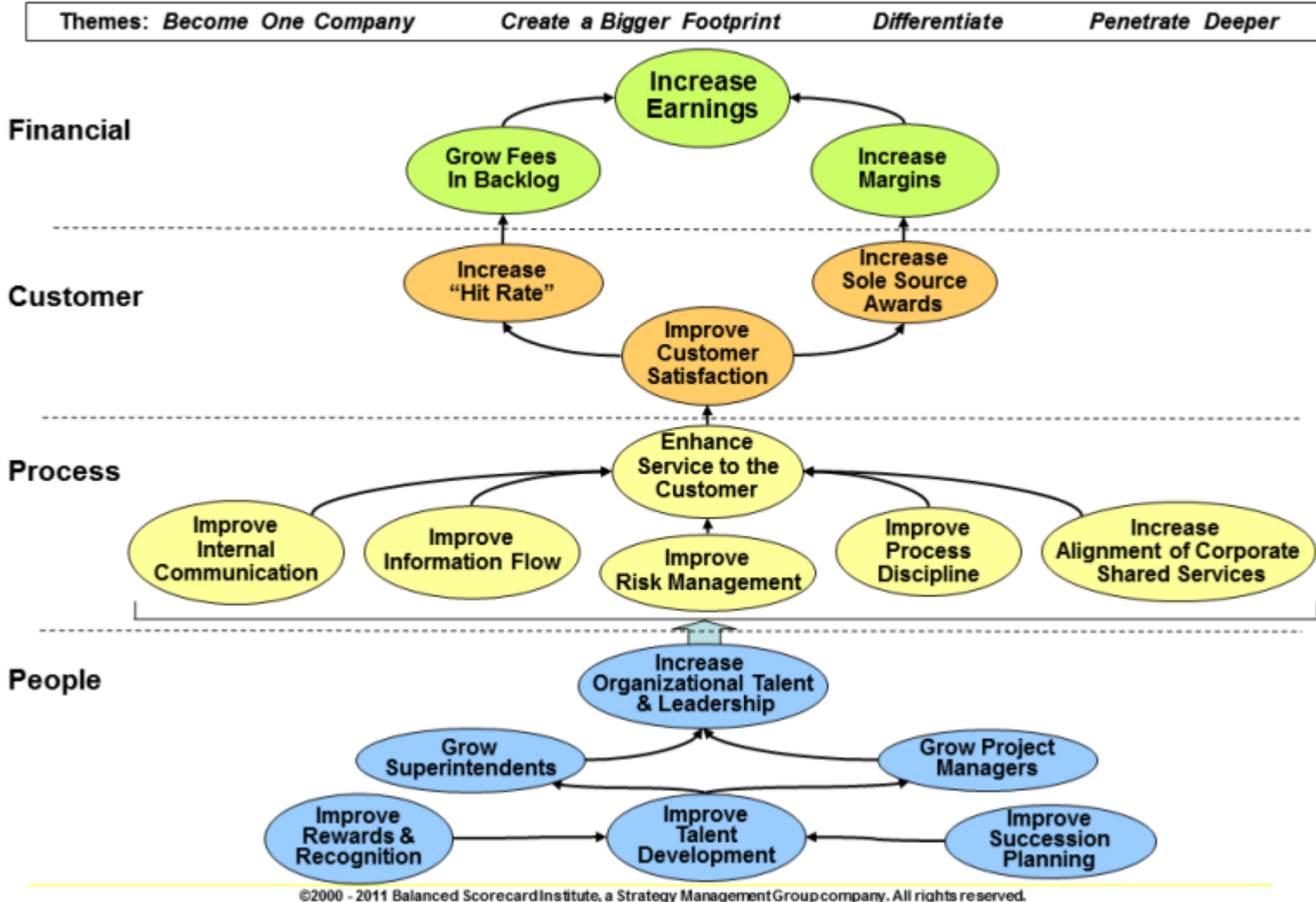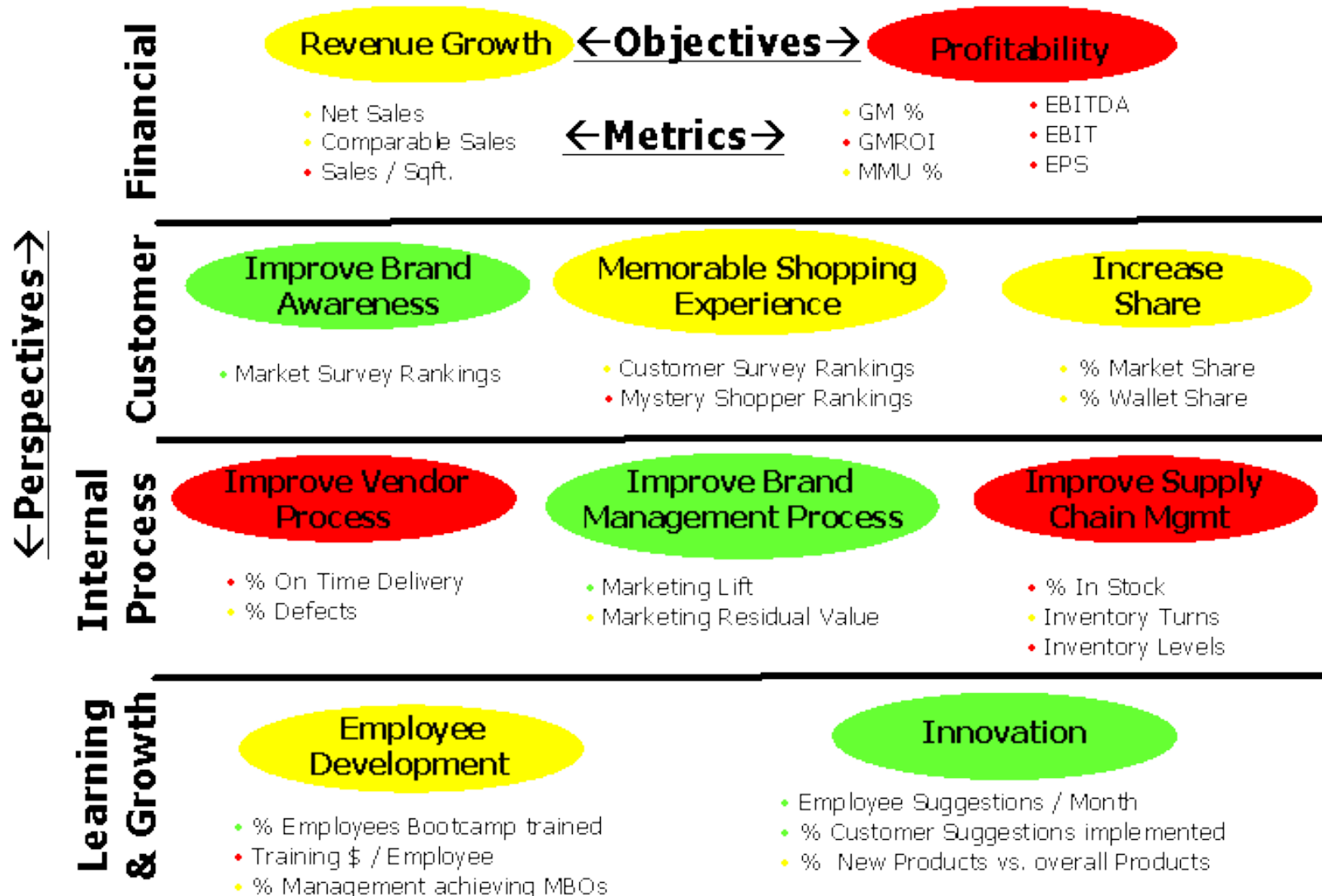
- Regional offices are geographically dispersed throughout North America.
- Zone directors have three to five district managers reporting to them.
- District managers have two to six branch/field offices reporting to them.

Balanced Score Card (BSC)

http://vectorstudy.com/management-theories/balanced-scorecard

Construction Company Strategy Map

Themes: *Become One Company   Create a Bigger Footprint   Differentiate   Penetrate Deeper*

http://www.balancedscorecard.org/portals/0/pdf/Make_Performance_Improvement_Strategic_BSI_Rohm.pdf

Example Balanced Scorecard: Regional Airline

Mission: Dedication to the highest quality of Customer Service delivered with a sense of warmth, friendliness, individual pride, and Company Spirit.

Vision: Continue building on our unique position -- the only short haul, low-fare, high-frequency, point-to-point carrier in America.

Theme: Operating Efficiency	Objectives	Measures	Targets	Initiatives
Financial Profitability Lower costs Increase Revenue	• Profitability • Fewer planes • Increased revenue	• Market Value • Seat Revenue • Plane Lease Cost	• 25% per year • 20% per year • 5% per year	• Optimize routes • Standardize planes
Customer On-time flights More Customers Lowest Prices	• Flight is on -time • Lowest prices • More Customers	• FAA On Time Arrival Rating • Customer Ranking • No. Customers	• First in industry • 98% Satisfaction • % change	• Quality management • Customer loyalty program
Internal Improve Turnaround Time	• Fast ground turnaround	• On Ground Time • On-Time Departure	• <25 Minutes • 93%	• Cycle time optimization program
Learning Align Ground Crews	• Ground crew alignment	• % Ground crew stockholders • % Ground crew trained	• yr. 1 70% yr. 4 90% yr. 6 100%	• Stock ownership plan • Ground crew training

Key Questions in BSC

● Finance : Through the eyes of the owners of the business, how will they judge financial success?

● Customer : Through the eyes of our customers, how will they judge the value of our products and services? How will we differentiate ourselves in the market?

● Internal Business Process : How can we improve internal processes to improve product, program and service quality, timeliness, economics, and functionality?

● Learning and Growth (or Employee) : How can our employees continuously get smarter, innovative, and improve?

http://www.balancedscorecard.org/LinkClick.aspx?fileticket=oPNqFu3i3gE%3d&tabid=56

Business Value of OTISLINE

Improved Profits

FINANCIAL

| Increased Service Contracts | | | Increased Elevator Sales |

CUSTOMER

Reduced Customer Complaints

Reduced Contract Cancellation

Improved Satisfaction and Relationship with Building Owner

Enhanced Brand Images to Individual Riders

INTERNAL PROCESS

Reduced Response Time | Improved Product Reliability | More Correct Problem Diagnosis | Consistency in Service Quality | Reduced Service Costs
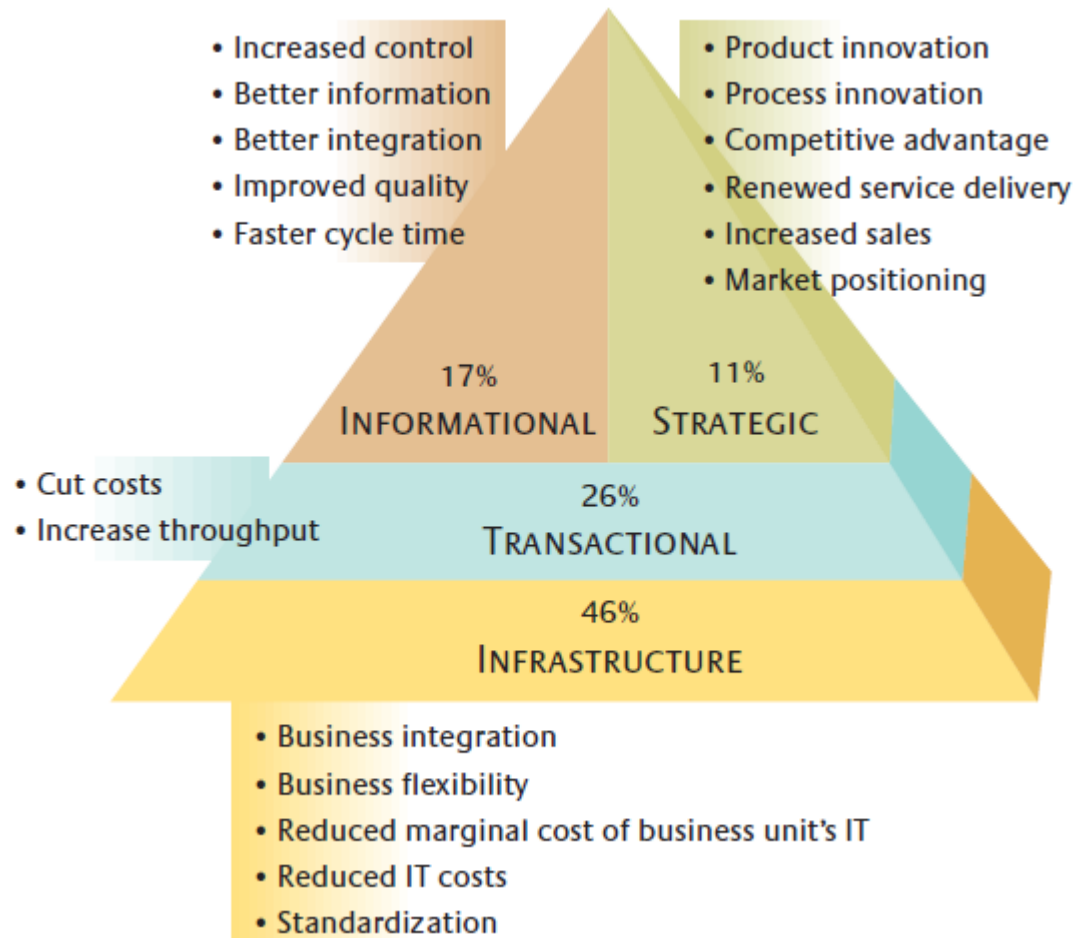

LEARNING & GROWTH

Transparency & Communication | Faster Decision Making & Communication | Flexible Employee Deployment | Improved Employee Training

Business Value from Different IT Categories

- Increased control
- Better information
- Better integration
- Improved quality
- Faster cycle time

- Product innovation
- Process innovation
- Competitive advantage
- Renewed service delivery
- Increased sales
- Market positioning

17%
INFORMATIONAL

11%
STRATEGIC

- Cut costs
- Increase throughput

26%
TRANSACTIONAL

46%
INFRASTRUCTURE

- Business integration
- Business flexibility
- Reduced marginal cost of business unit's IT
- Reduced IT costs
- Standardization

Source: Weill, P. and Aral, S. (2006) "Generating Premium Returns on Your IT Investments," MIT Sloan Management Review (47:2)

IT Asset Category

● **Transitional IT** : IT that is primarily used to cut costs or increase throughput for the same cost

● **Informational IT** : to provide information for purposes such as accounting, reporting, compliance, communication, or analysis

● **Strategic IT** : to gain competitive advantages by supporting entry into new markets or by helping develop new product, services, or business processes

● **Infrastructure IT** : the shared IT services used by multiple applications such as servers, network, and databases

Source: Weill, P. and Aral, S. (2006) "Generating Premium Returns on Your IT Investments," MIT Sloan Management Review (47:2)

Different IT Assets Deliver Different Value

The up and down arrows gauge the average changes in profitability, innovation and market value the year after an IT investment is made. For example, companies that invest more heavily than their competitors in transactional IT have lower costs.
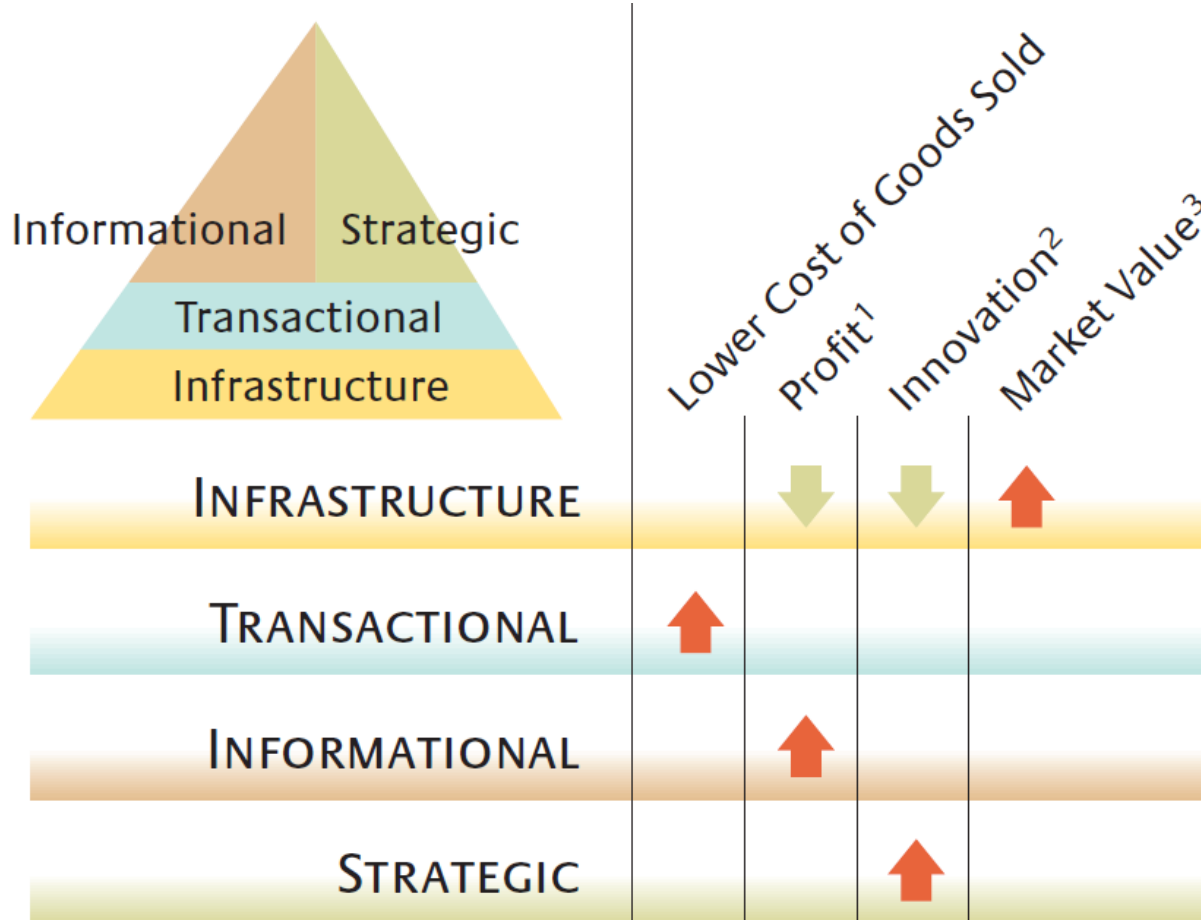
$$^1\ Net\ Margin = \frac{Income\ Before\ Extraordinary\ Items}{Total\ Sales}$$

$$^2\ \frac{Sales\ From\ Modified\ Products}{Total\ Sales} \quad and \quad \frac{Sales\ From\ New\ Products}{Total\ Sales}$$

^{3} The Market to Book value of company stock in the same year the investment is made.

Source: Weill, P. and Aral, S. (2006) "Generating Premium Returns on Your IT Investments," MIT Sloan Management Review (47:2)

Companywide IT Savvy Affects Performance

Our research assessed each company's relative IT savvy by cataloging its practices, processes and capabilities. As indicated below, across all four IT asset classes, companies with high IT savvy achieved higher performance from each IT dollar invested.
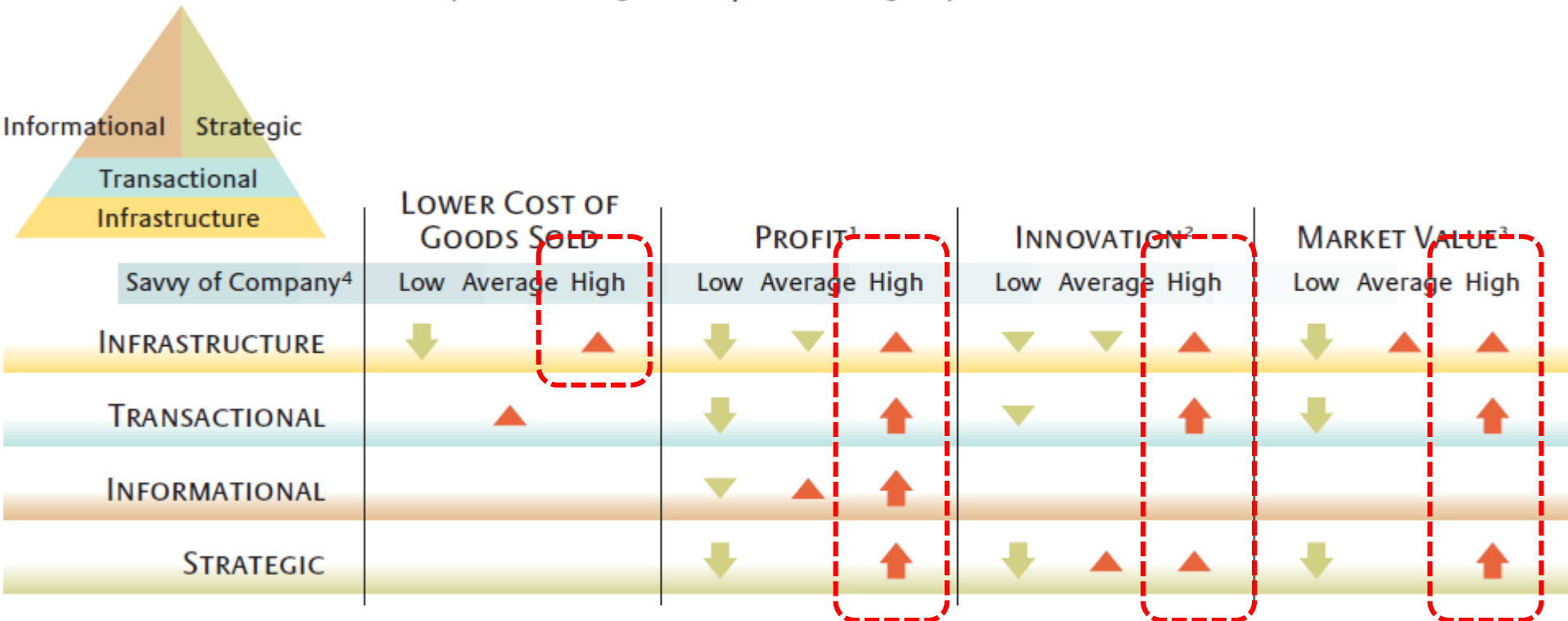
- ● What do you think *IT savvy* is?

Source: Weill, P. and Aral, S. (2006) "Generating Premium Returns on Your IT Investments," MIT Sloan Management Review (47:2)

The Five Characteristics of IT Savvy

Companies with high IT savvy have developed five mutually reinforcing characteristics.* The first three are practices related to IT use and the last two are competencies needed for high IT savvy.

Practices

| **IT FOR INTERNAL AND EXTERNAL COMMUNICATION** | Intensity of electronic communication media such as e-mail, intranets and wireless devices for internal and external communications and work practices |

| **INTERNET USE** | Internet-based architectures (i.e., open) for key functions like sales force management, employee performance measurement, training and post-sales customer support |

| **DIGITAL TRANSACTIONS** | Percent digitization of transactions executed with both suppliers and customers |

Competencies

| **COMPANYWIDE IT SKILLS** | Technical and business skills of IT people, IT skills of business people and ability to hire skilled IT people |

| **MANAGEMENT INVOLVEMENT** | The degree of senior management commitment to IT projects and the degree of business unit involvement in IT decisions |

Source: Weill, P. and Aral, S. (2006) "Generating Premium Returns on Your IT Investments," MIT Sloan Management Review (47:2)

Justification of Business Value of IT

● Business value and benefits from IT investments are multi-faceted and dynamic.

● A CIO should be able to justify IT's business value

▪ not only in terms of easy-to-measure indicators such as efficiency, cost reduction, or product quality

▪ but also with hard-to-measure (intangible), long-term factors such as customer satisfaction, brand, or market value.

● A CIO should not overlook strategic values (organizational agility, business flexibility) and innovation.

Next Class

● Cost of IT

● Read the <u>IT Adventure Chapter 4 and 5</u> and write <u>one brief</u> of up to 200 words by 10:00am on Feb 9.

● Sign up for presentation

  ▪ IT Adventure - Chapter 4

  ▪ IT Adventure - Chapter 5