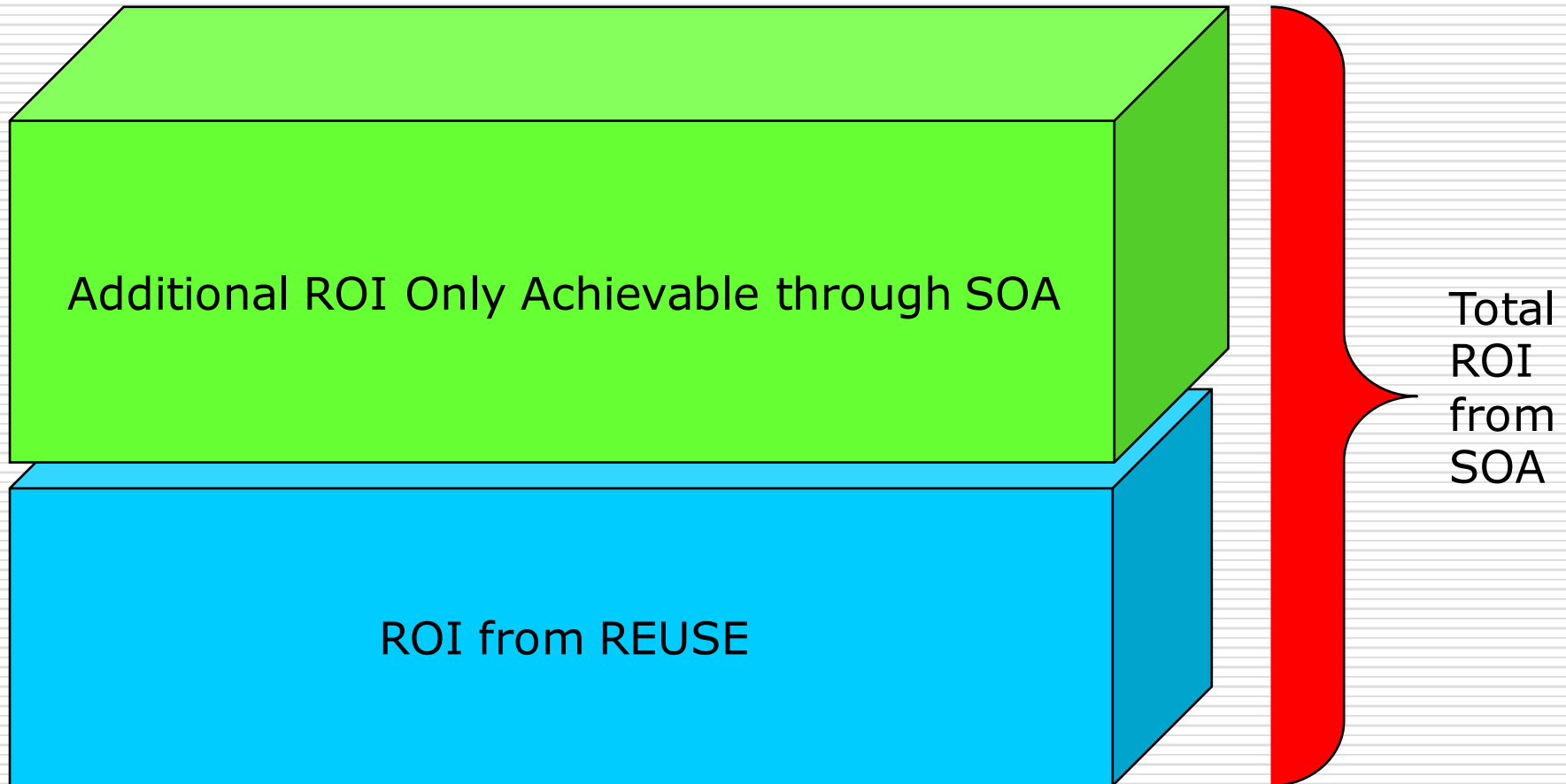

SECTION 6

ECONOMICS OF SOA

Overview of SOA ROI

- ROI for SOA is challenging for most organizations
 - Recall that $ROI = \text{Net Benefits} / \text{Investment}$
- Few organizations can provide ROI proofs, e.g. payback
- There is no single ROI model for SOA
- ROI realized at different phases of SOA implementation
- SOA is a long-term strategic investment
- A key area of research is to learn more about the economics of SOA including its **benefits, cost and cost justification model**
- A significant amount of research has been done on economics of **reuse**—benefits, cost and cost justification
 - See Lim [11], Boehm [2, 4] and Reifer [13, 15]
- **Reuse** is the underpinning of SOA

Total ROI: Reuse + Incremental SOA



Business Case Principles [See Reifer, Reference #13]

- ❑ Decisions are made relative to alternatives
- ❑ If possible, money should be used as a common denominator
- ❑ **Sunk costs** are irrelevant
- ❑ Investment decisions should recognize the **time value of money**
- ❑ Separable decisions should be considered separately
- ❑ Decisions should consider both quantitative and qualitative factors
- ❑ The risks associated with the decision should be **quantified** if possible
- ❑ The timing associated with making decisions is critical
- ❑ Decision processes should be **periodically assessed**
- ❑ Decision processes should be **continually improved**

Example Using ROI and Present Value

- ❑ Let us assume management is seriously considering funding your SOA proposal
- ❑ Your justification for the estimated expenditure is based on *shorter time to market*
- ❑ You believe you will save **\$350,000.00 USD** a year if you invest **\$250,000.00 USD** a year over **4** years
- ❑ Assume cost of money is **8%** per year
- ❑ Definitions
 - $\text{ROI} = \text{Net Benefits} / \text{Investment}$
 - $\text{Present Value (PV)} = (\text{Future Worth}) / (1 + \text{Rate}/100)^N$
 - ❑ $N = \text{Number of periods}$
 - $\text{Future Worth (FW)} = (\text{Present Value}) * (1 + \text{Rate}/100)^N$

Example Using ROI and Present Value

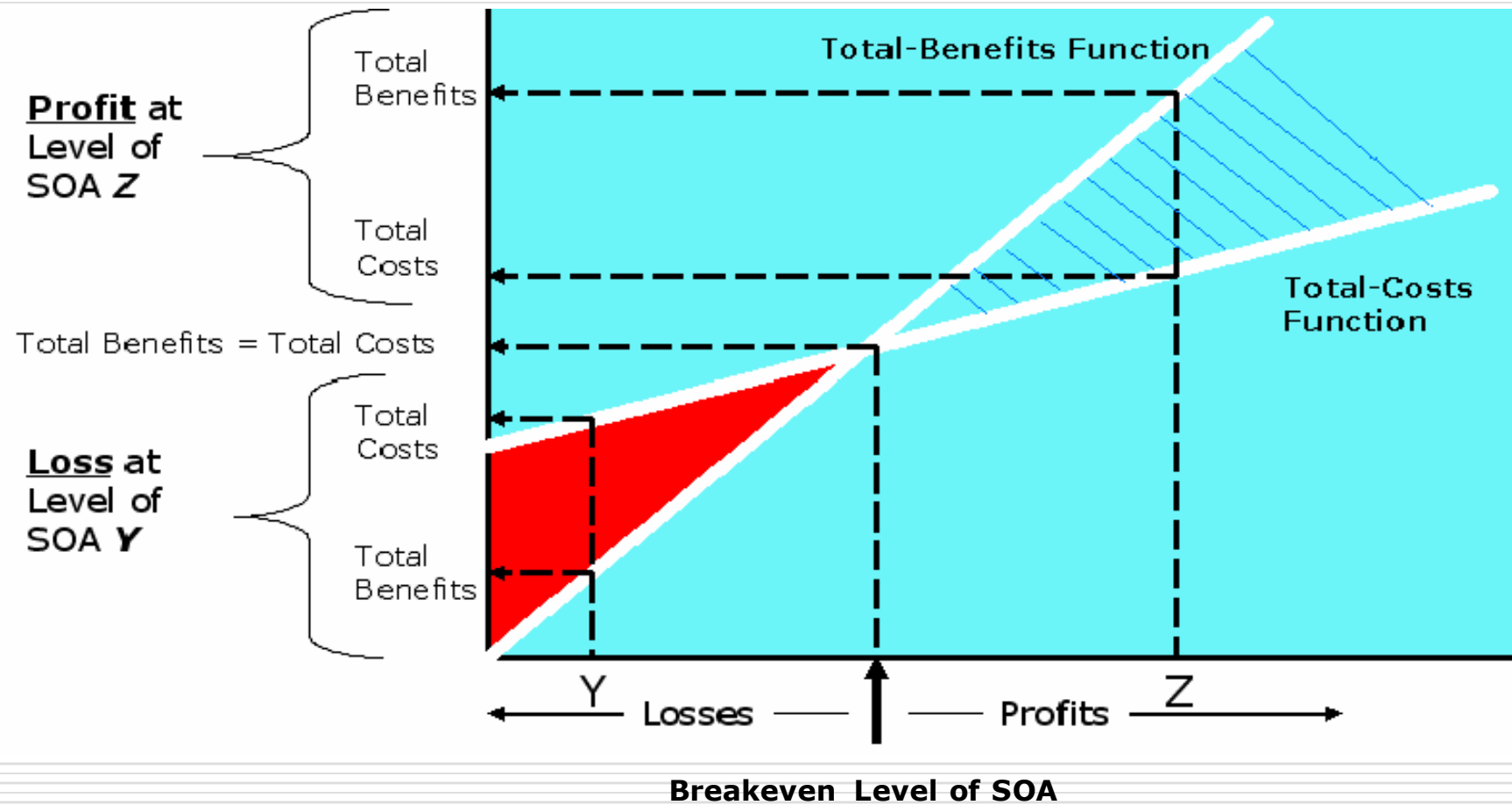
Year	SOA Implementation Investment	Benefits	Net Benefits	$1/(1+i)^N$	Present Value of Net Benefits
1	\$250,000,000	\$350,000,000	\$100,000,000	0.9259	\$92,592,593
2	\$250,000,000	\$350,000,000	\$100,000,000	0.8573	\$85,733,882
3	\$250,000,000	\$350,000,000	\$100,000,000	0.7938	\$79,383,224
4	\$250,000,000	\$350,000,000	\$100,000,000	0.7350	\$73,502,985
	\$1,000,000,000		\$400,000,000		\$331,212,684
Assumptions					
1. Cost of money = 8%					
2. 4-year Investment					
ROI Over 4 Years:		40%			
Annual ROI:		10%			

Discussion on ROI and Present Value

- Should the CEO/CFO/CIO invest with an annual ROI of 10%?
 - Why?
 - Why Not?
 - What return is acceptable? Does it depend on the corporate policy?

- What are your interpretations of the Present Value (PV)?
- What costs would you quantify as an SOA investment?
- What benefits would you quantify?
- What about some of the qualitative benefits?

Breakeven Analysis



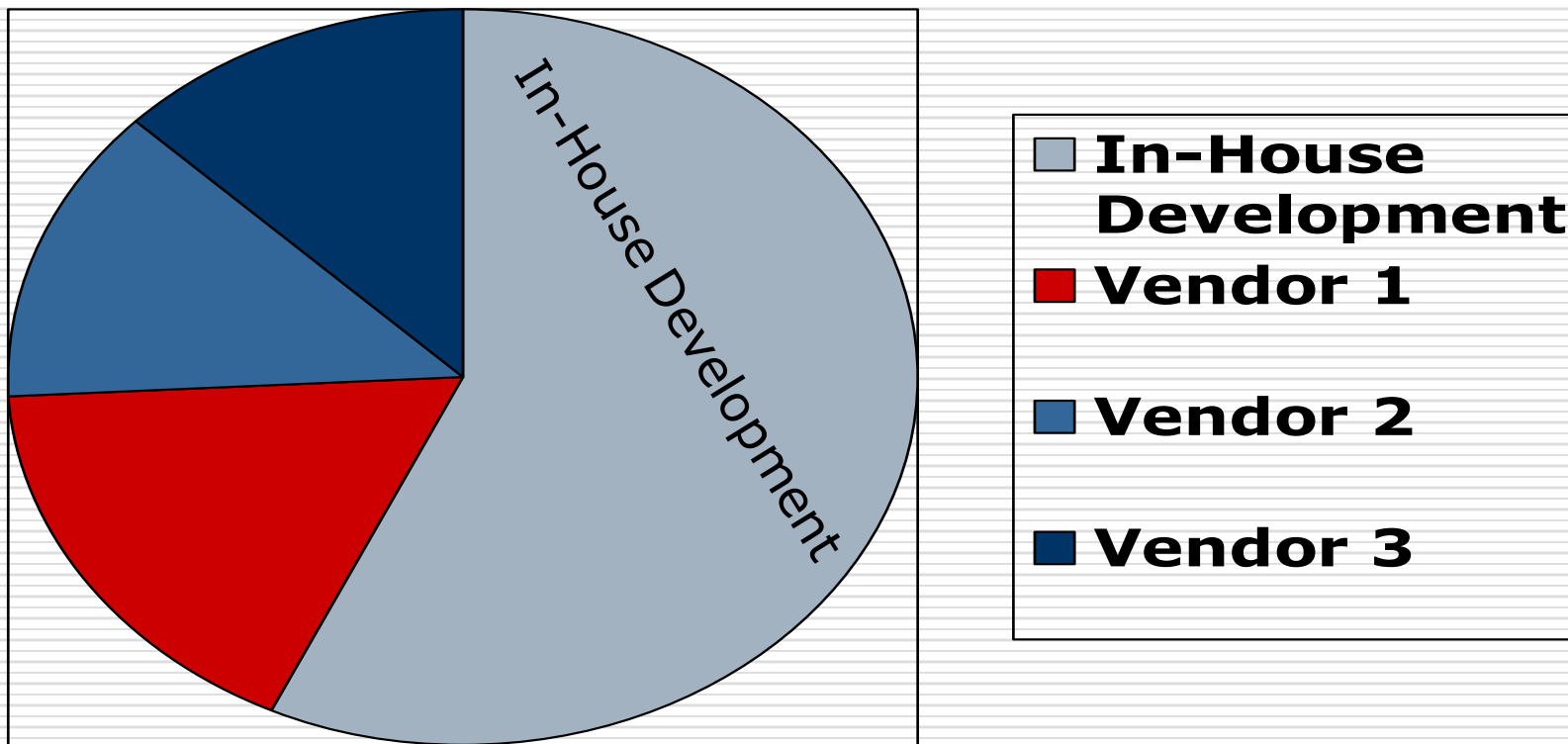
Source: Adapted from C. T. Horngren & G. Foster, *Cost Accounting: A Managerial Emphasis*, Prentice Hall, 1987, p. 51

Break-even Analysis Cont'd

- Idea behind break even analysis is **volume**
- For an SOA environment, what **volume metric** makes sense?
 - # Individual Web Services implemented and consumed by at least **N** consumers?
 - What is a good number for **N**: 3, 4, 99?
- Is **volume** enough?
- What about **domain** coverage?
 - This is subjective
 - Is there a healthy ecosystem of WS that would create a trend towards a decline in number of lines of code?
- How do we construct the **Total-Benefits & Total-Costs** functions?

Build VS Buy Analysis

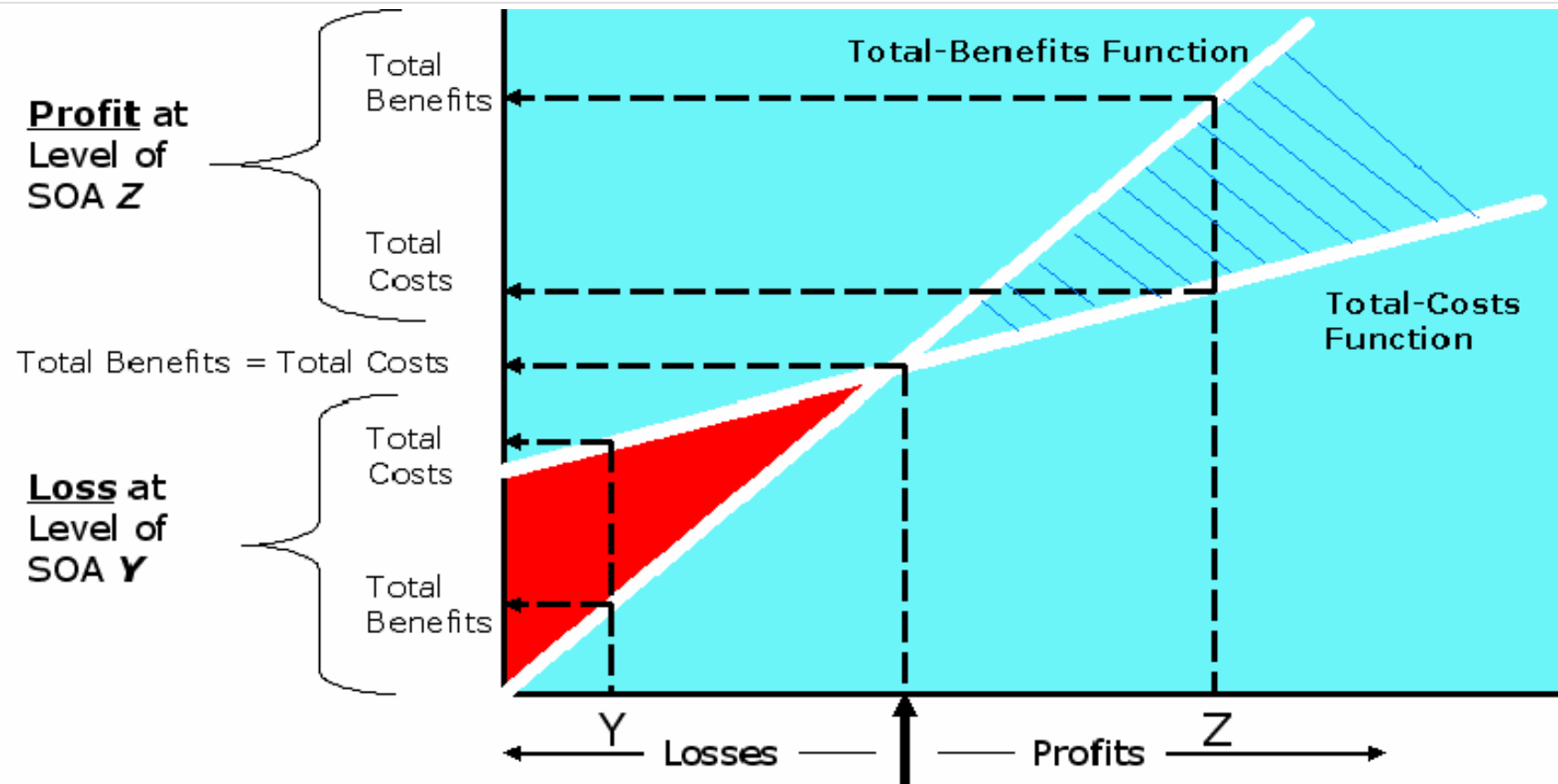
- ❑ Full domain could involve vendors who provide Web Services



Build VS Buy Analysis Cont'd

- Should think about extending set of available services through buying services (COTS)
- **Xignite** is a great example of a company that develops Web Services for Financial Services domain
 - Market Data
 - Company Data
 - Tools
 - [xignite Financial Web Services](#)
- **strikeiron** is another great example of a company that develops Web Services for various domains
 - Communications, CRM, Data Enhancement
 - Financial, Government, Lead Verification
 - Marketing, Other, Utilities, eCommerce
 - [strikeiron Web Services](#)

Breakeven Analysis Revisited

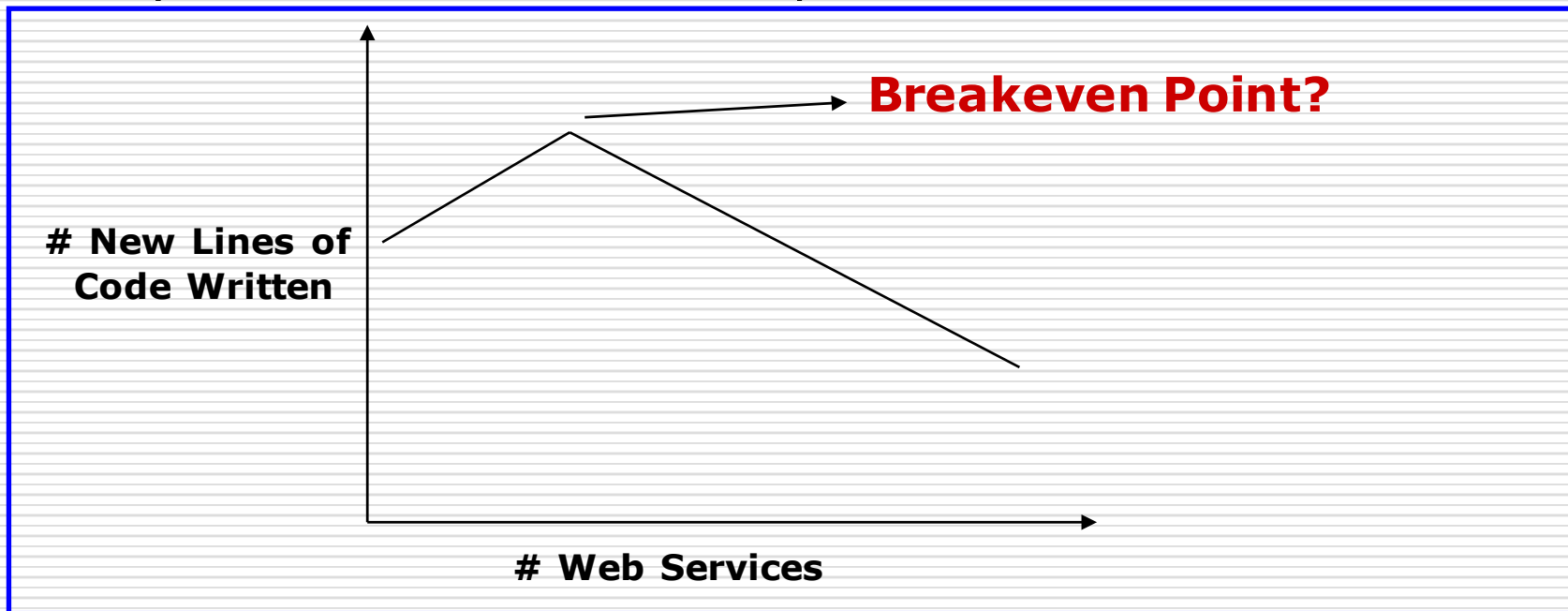


Web Services that provides volume required for Breakeven Level

Source: Adapted from C. T. Horngren & G. Foster, *Cost Accounting: A Managerial Emphasis*, Prentice Hall, 1987, p. 51

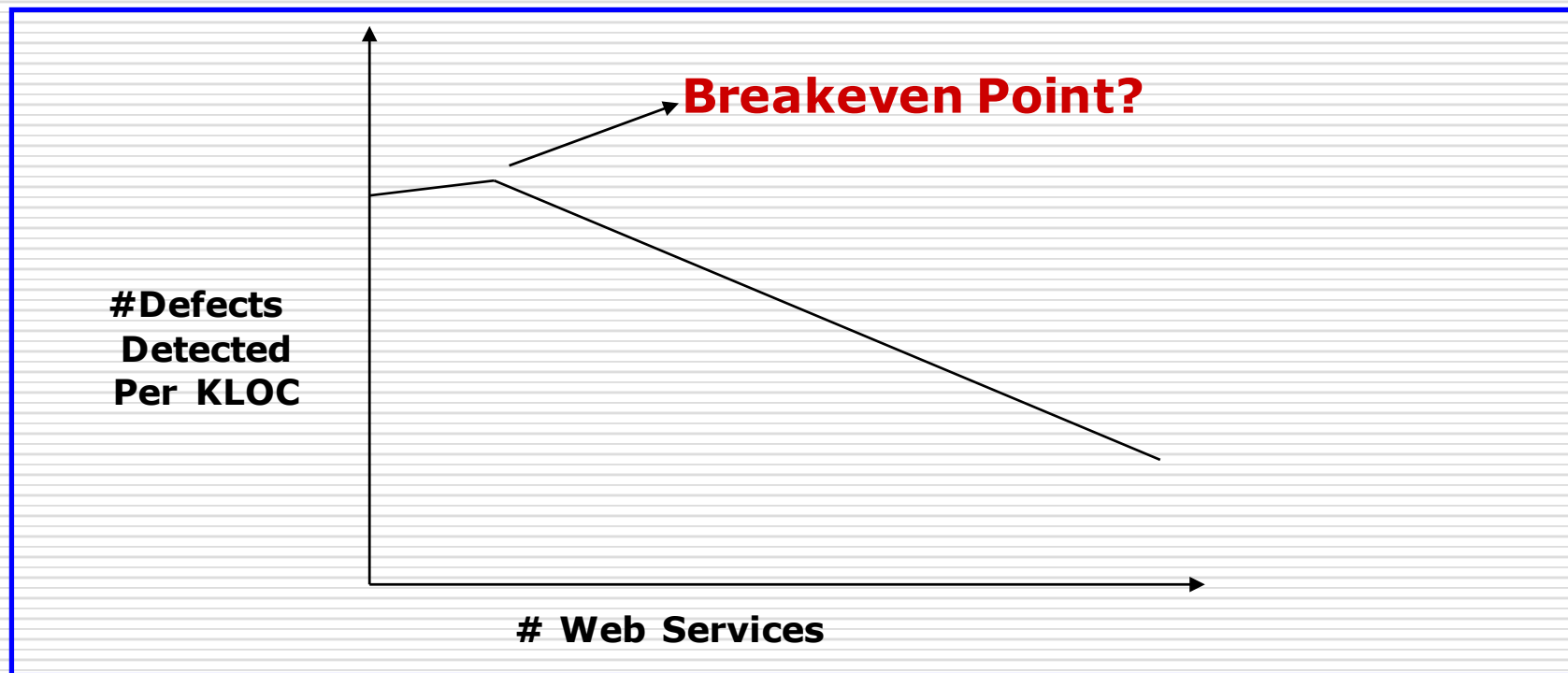
Trend Analysis: New Lines of Code

- ❑ Is there a healthy ecosystem of Web Services that would create a trend that indicates a consistent decline in **new** number of lines of code?
- ❑ Maybe after the breakeven point?



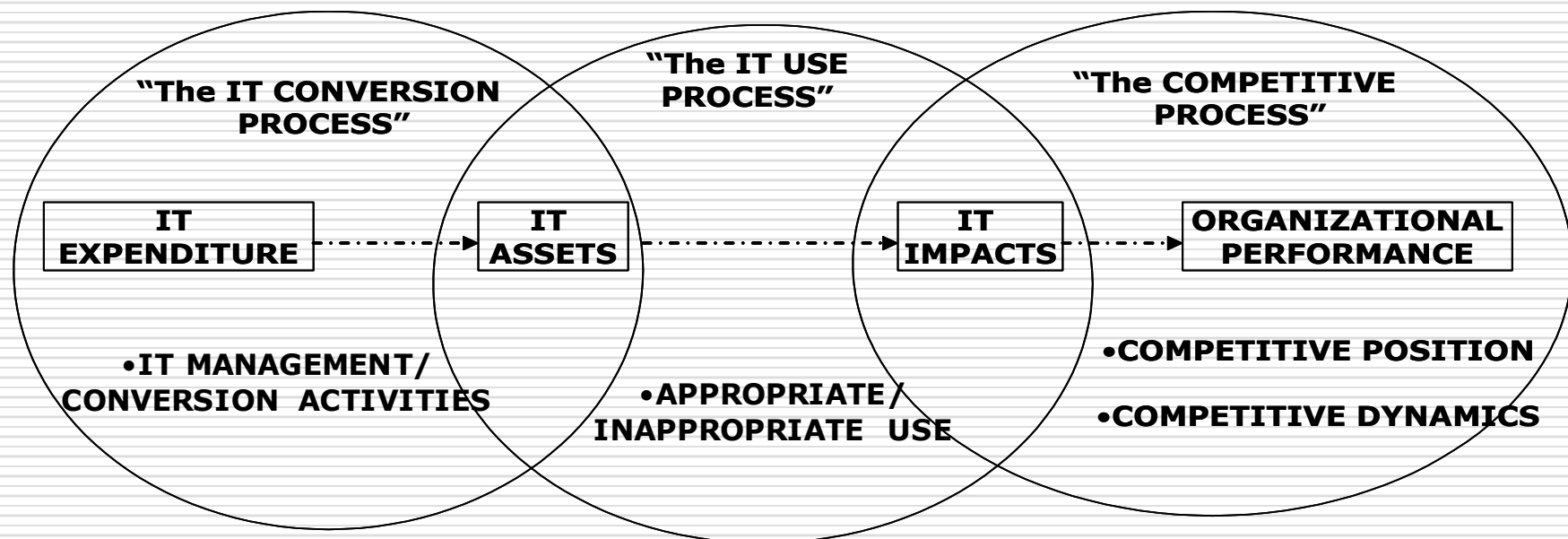
Trend Analysis: Quality

- ❑ What about **quality**?
- ❑ Is there a healthy ecosystem of WS that would create a trend that indicates consistent improvement in **quality**?



A Paradigm for SOA ROI

- Eric Marks and Michael Bell provide some insights into the complexity of ROI for SOA [52]
- They leverage the work of Soh and Markus to derive a value model for SOA



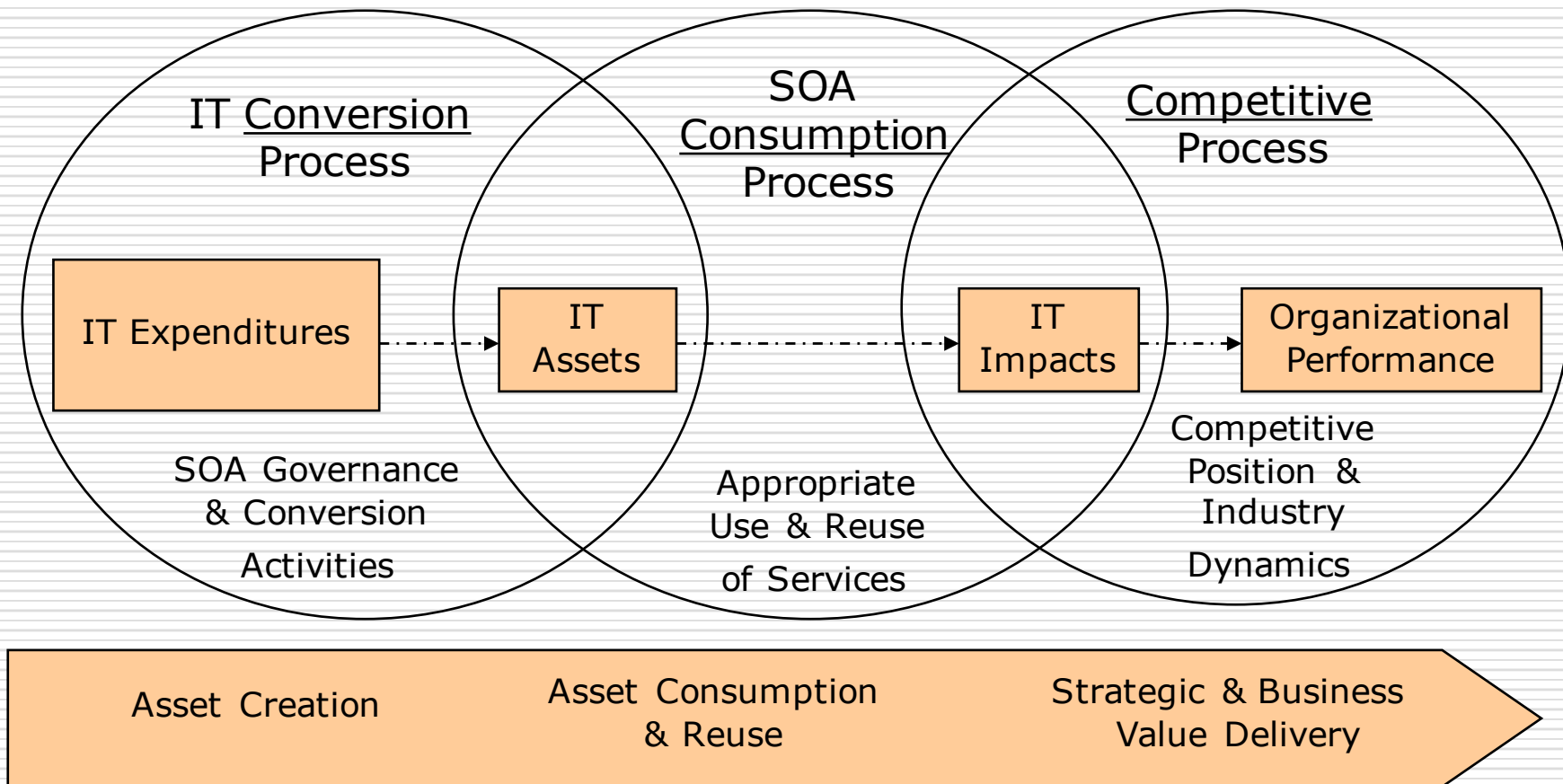
How IT Creates Business Value: A Process Theory

Source: *How IT Creates Business Value: A Process Theory Synthesis*, Soh and Markus, pp. 29-41

A Paradigm for SOA ROI Cont'd

- Marks' and Bell's Main Idea
 - Process of *conversion* creates SOA assets, or services
 - Assets or services are *consumed* by developers, analysts, customers & suppliers
 - This impacts the organization's *competitive* advantage
 - There are 3 broad value-creating processes:
 - *Conversion* value
 - *Consumption* value
 - *Competitive* value
 - Marks and Bell posit that there are **multiple** ROIs associated with each of the processes mentioned earlier

Summary of Value Creating Processes



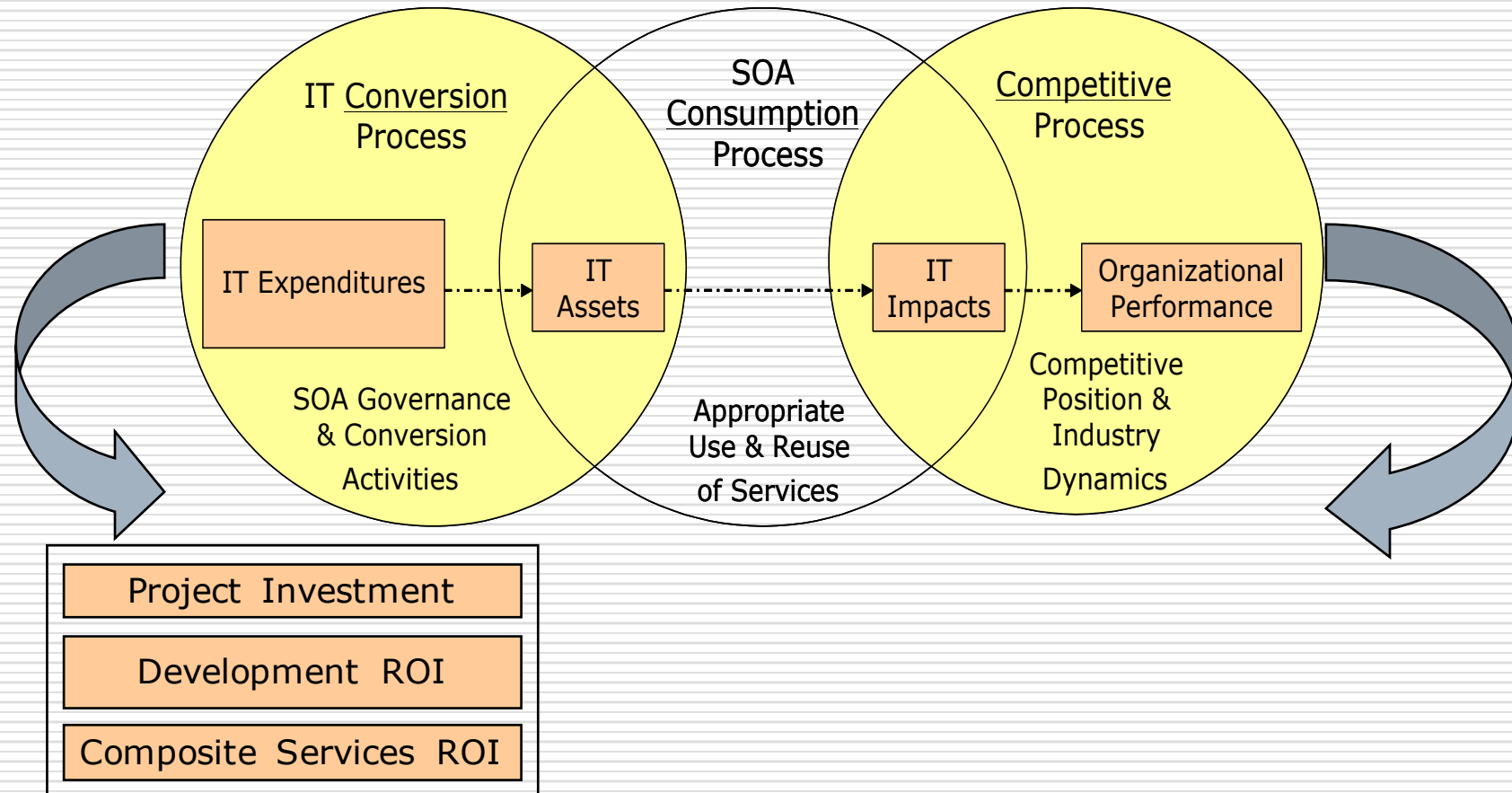
Process Approach to Creating SOA Value

Source: *Service Oriented Architecture: A Planning and Implementation Guide for Business and Technology*, pp. 328

Conversion Process ROI

- Project ROI
 - Reduced cost, reduced development time for a specific project
- Development ROI
 - Reduced development time
 - Better software quality
- Composite Services ROI
 - Faster development time using building block services
- Reuse ROI
 - Attained in subsequent iterations when enough services are able to be reduced
 - Initially this ROI may be small

Conversion Process ROI Summary



SOA ROI Threshold Model: Conversion Value

Source: *Service Oriented Architecture: A Planning and Implementation Guide for Business and Technology*, pp. 338

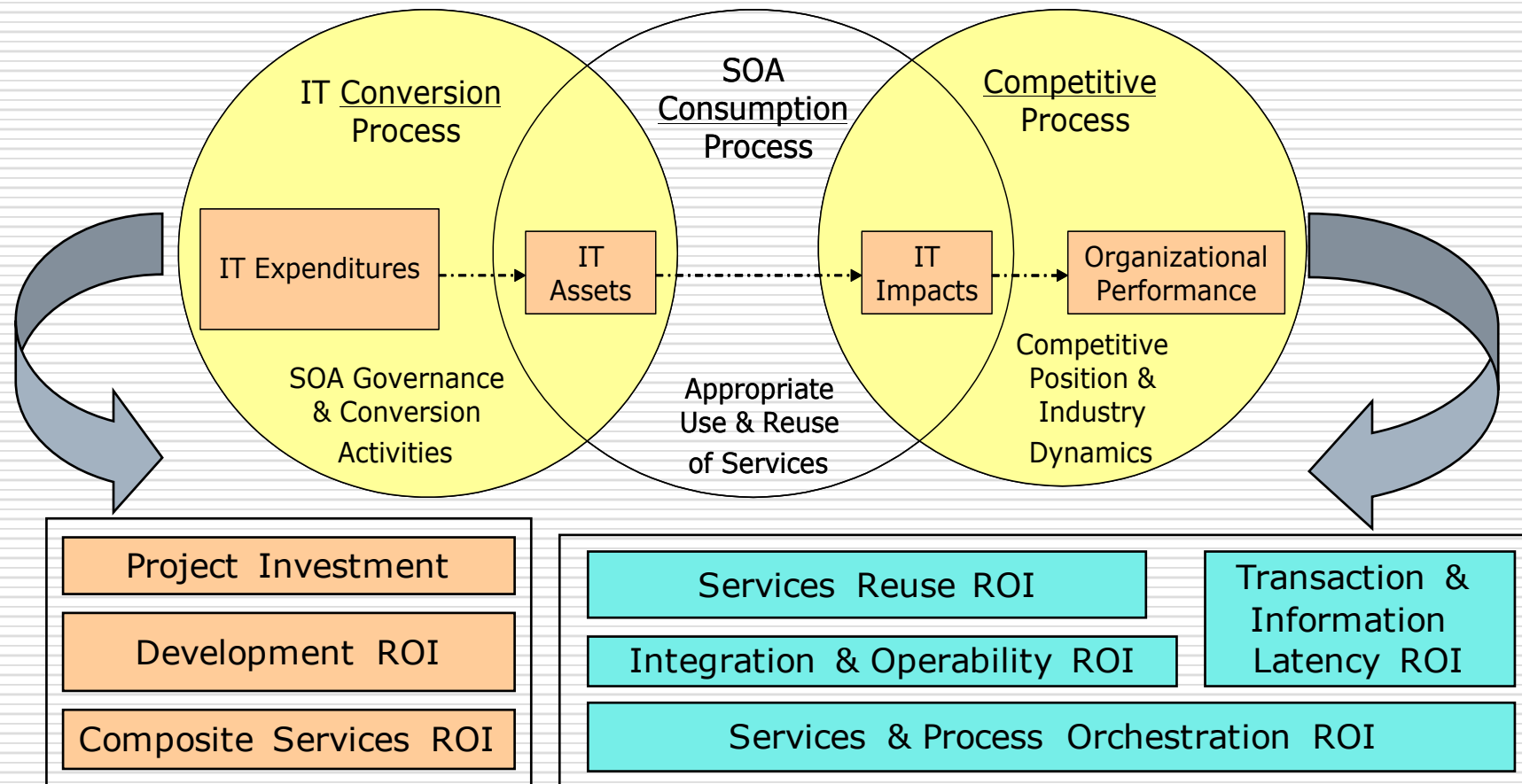
Consumption Process ROI

- Services Reuse ROI
 - Cost avoidance savings when services are reused
- Integration and Operability ROI
 - Cost avoidance from:
 - Implementing standards-based services rather than proprietary integration strategies
 - Reduced need to purchase licenses for proprietary integration middleware
 - Leveraging reuse of pre-built interoperable services to avoid point-to-point integrations common in the pre-SOA generation of IT
 - In an SOA, services are already integrated
 - No incremental integration tasks are required to make them interoperate

Consumption Process ROI Cont'd

- ❑ Services and process orchestration ROI
 - Benefits from orchestrating:
 - ❑ Composite services and applications
 - ❑ Business processes within enterprise
 - Additional benefits include:
 - ❑ Faster time to market for IT solutions and business initiatives
 - ❑ Lower development costs & reduced development time
 - ❑ Reduced maintenance of applications due to reuse
 - ❑ Additional levels of service reuse
- ❑ Transaction & Information Latency ROI
 - Includes benefits of removing stale info from business processes
 - Allows implementation of event-based services
 - ❑ Replaces batch-driven processes
 - ❑ Allows real time access to information

Consumption Process ROI Summary



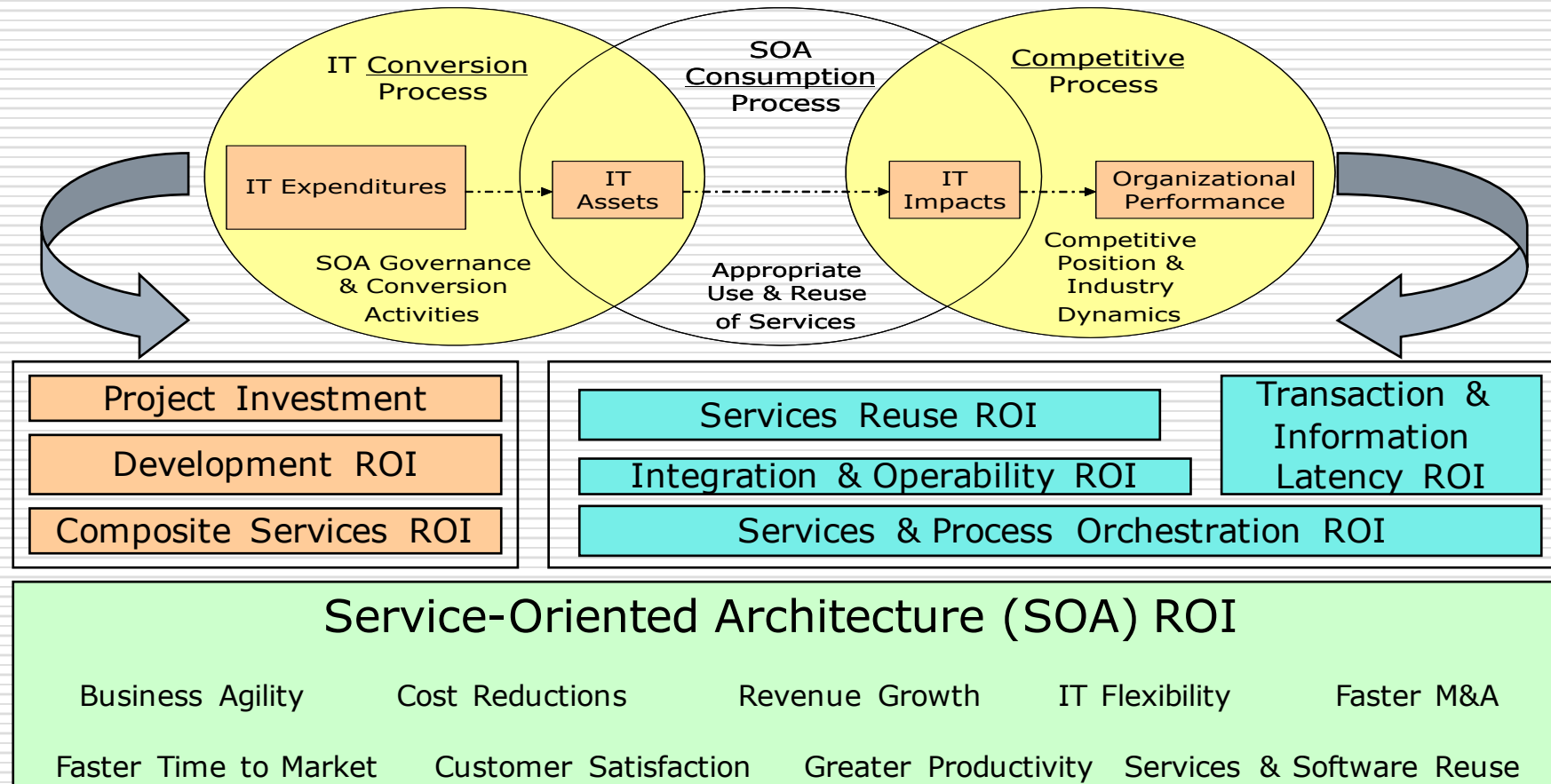
SOA ROI Threshold Model: Consumption Value

Source: Service Oriented Architecture: A Planning and Implementation Guide for Business and Technology, pp. 328

Competitive Value—SOA ROI

- Business Agility
- Faster Time to Market
- Cost Reductions
- Customer Satisfaction
- Revenue Growth
- Greater Productivity
- IT Flexibility
- Services & Software Reuse
- Faster M & A

Competitive Value—SOA ROI



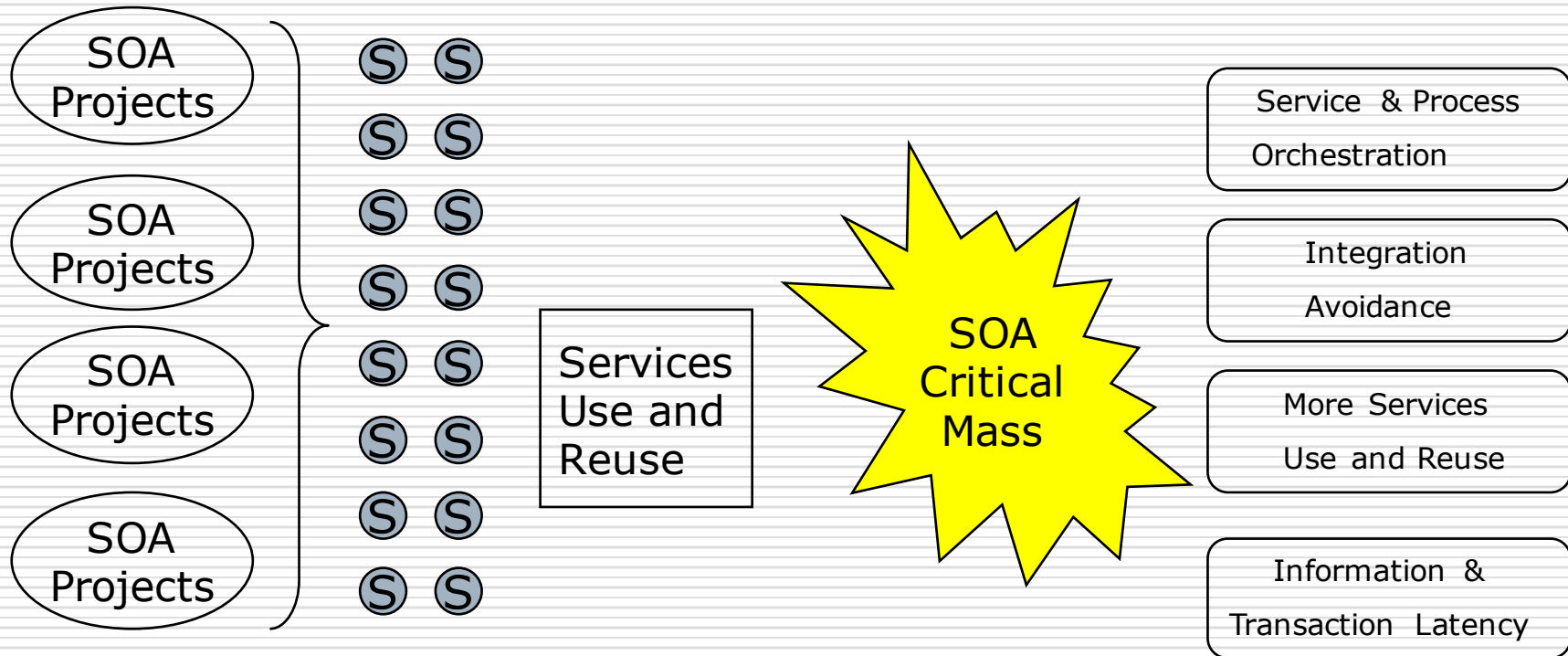
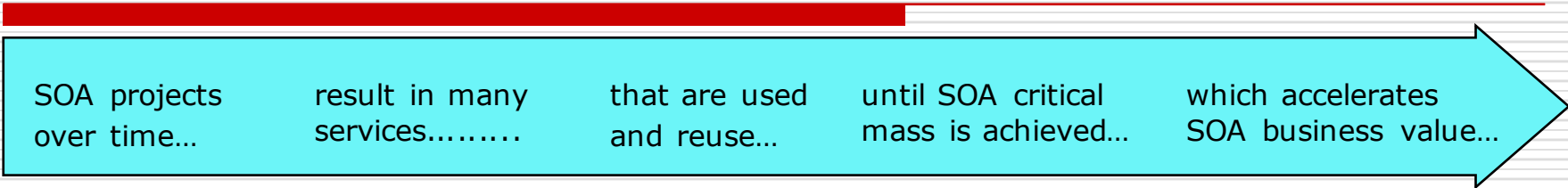
Competitive Value in the SOA ROI Threshold Model

Source: *Service Oriented Architecture: A Planning and Implementation Guide for Business and Technology*, pp.339

SOA Needs Critical Mass

- ❑ Value of individual service is low until there are enough consumers (reuse) to accelerate return on services
- ❑ Value of an SOA increases as the volume of services and consumers increase
- ❑ Volume needs to hit critical mass
- ❑ *SOA network effects* kick in at that time
- ❑ SOA critical mass is:
 - Point where there are enough available reusable services
 - Such that one business process can be orchestrated from them

SOA Needs Critical Mass



Competitive Value in the SOA ROI Threshold Model

Source: *Service Oriented Architecture: A Planning and Implementation Guide for Business and Technology*, pp.339