# MI 720 Session #9

*Topics*

- *Justifying IT initiatives (Moore Medical)*
- *Mini-Lecture: Business Value of IT*



## Justifying IT Investments

Let's suppose…

…You've done the basics

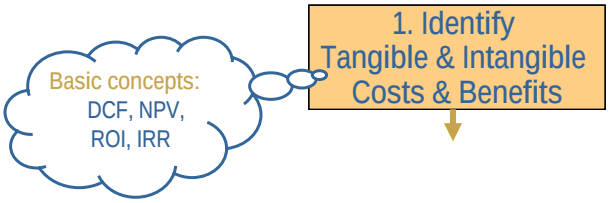
- You've framed the problem/opportunity right
- You've identified all the reasonable alternatives
- You've narrowed your focus to best alternatives

… and there is not an easy answer

- At least one alternative looks promising
- No alternative is an obvious strategic "must have"
- No alternative is obviously the best/obviously pays off

*Now what?*

# Justifying IT Investments: Step 1

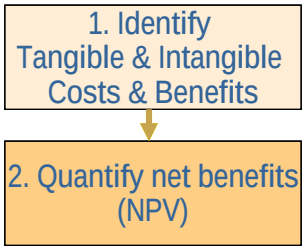





# Costs/Benefits Matrix

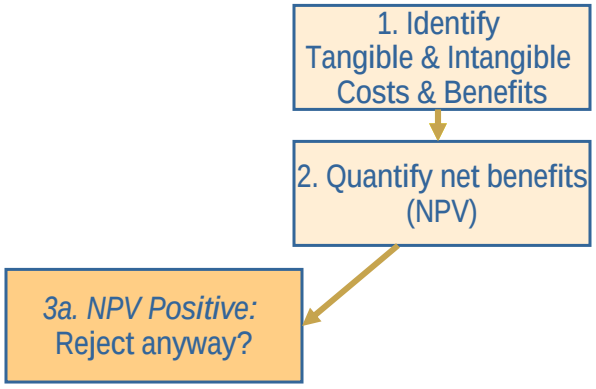
| | Tangible | Intangible |
|---|---|---|
| Costs | • Hardware, software, telecom, services,<br>• Personnel (develop-ment, implementation, training) | • Lower morale?<br>• Disruption of operations?<br>• Reverse of intangible benefits… |
| Benefits | • Increased cash flows<br>• Increased productivity<br>• Lower operational costs<br>• Reduced workforce<br>• Lower expenses<br>• Lower facility costs | • Org. flexibility, more timely info, better decisions, org. learning, employee good-will, job satisfaction, client satisfaction, corporate image…. |

## Justifying IT Investments: Step 2






## Justifying IT Investments: Step 3a



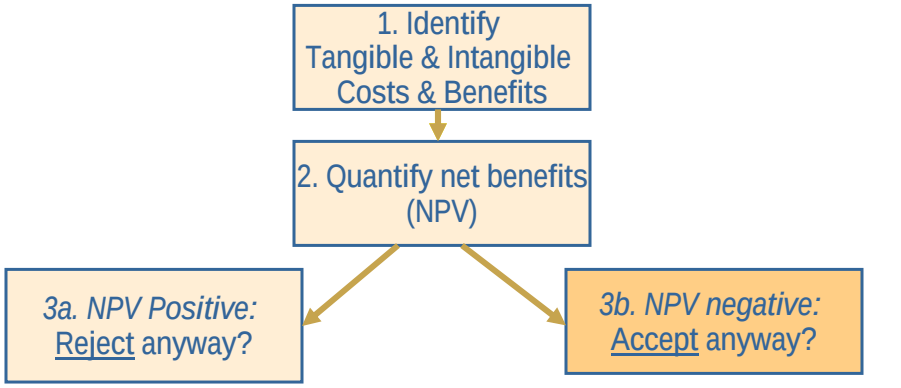

- Other projects are even better?
- High risk of failure that can't be managed away?

## Kinds of IT Investment Risks [Clemons 1991]

- Financial risk: We can't afford it
- Technical risk: It can't be done
- Project risk: We can't do it (too complex, too big, too hard)
- Functionality risk: What the user wants or needs may change
- Systemic risk: The world might change in an adverse way because we did the system ("*Law of unintended consequences…*")



## Justifying IT Investments: Step 3b



## The "Vanishing Status Quo" [Clemons 1991]

- Cash flow analyses need a baseline for comparison, e.g., how things are now (the "status quo")
  - What savings will there be over the existing cost structure?
  - What incremental net revenues will there be over existing revenues?
- But what if the status quo will vanish if you don't do the project?



## Real Options

- Formal definition of a real option:
  - The right, but not the obligation, to take ownership of some real world asset
- Real options in an IT context:
  - A small investment that gives information about the payoffs of a larger follow on investment
  - The opportunity to redirect the path of a project based on new information

## Common types of Real Options

- Deferral Option: A decision on whether to invest can be deferred for some period without imperiling the potential benefits
- Abandon Option: A project can be terminated midstream and still redeploy remaining project resources
- Stage Option: A project can be divided into distinct stages where pursuit of each stage is contingent on a reassessment of costs and benefits at the time the preceding stage is completed
- Strategic Growth Option: An initial baseline system opens the door to pursue a variety of potential follow-on opportunities



## Summary: Thinking Systematically about Justifying IT Investments

- Do a thorough qualitative analysis:
  - What problem are we really trying to solve?
  - What are different ways to solve it? What system features would be useful?
  - What are our organizational capabilities?
  - Is IT investment the best way to solve the organizational problem?
- Identify the most promising alternatives
  - Identify if there is an "easy answer"
- If there is no easy answer, evaluate each option
  1. Identify tangible & intangible costs & benefits
  2. Quantify net benefits (e.g., NPV)
  3. Look for the exception cases (Accept a negative NPV project? Reject a positive NPV project?)

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# The IT "Productivity Paradox"

- The paradox: An explosion of IT investment in the 1970's and 1980's accompanied by a *decrease* in aggregate productivity growth

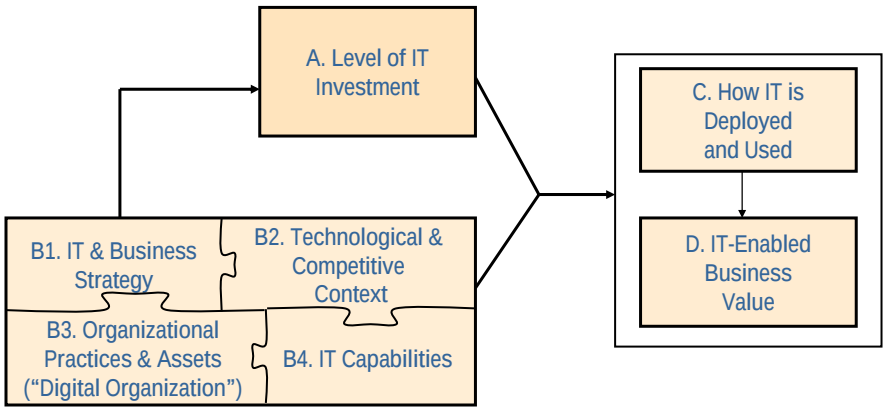
*"We see the computer age everywhere except in the productivity statistics" – Robert Solow, 1987*

# Academic Studies of IT Business Value

- IT capital investments (measured as IT HW spending) have an ROI of over 50% (as implied by the estimated multi-factor productivity contribution of IT capital) [Brynjolfsson & Hitt 1996]
- Firms that invest heavily in IT (measured as all IT spending) have a significantly higher Tobin's Q [Bharadwaj et al 1999]
- Firms with high IT capabilities (rated by InfoWeek editors) outperform control sample on firm-level cost (e.g. COGS, SGA) & performance (ROA, ROS) measures [Bharadwaj 2000]
- Hospitals with greater IT usage (total disk I/O) have better operational performance (mortality rates, cost per stay) [Devaraj & Kohli 2003]
- Abnormal market returns occur for firms announcing IT for strategic transformation in industries transformed by IT [Dehning et al 2003]

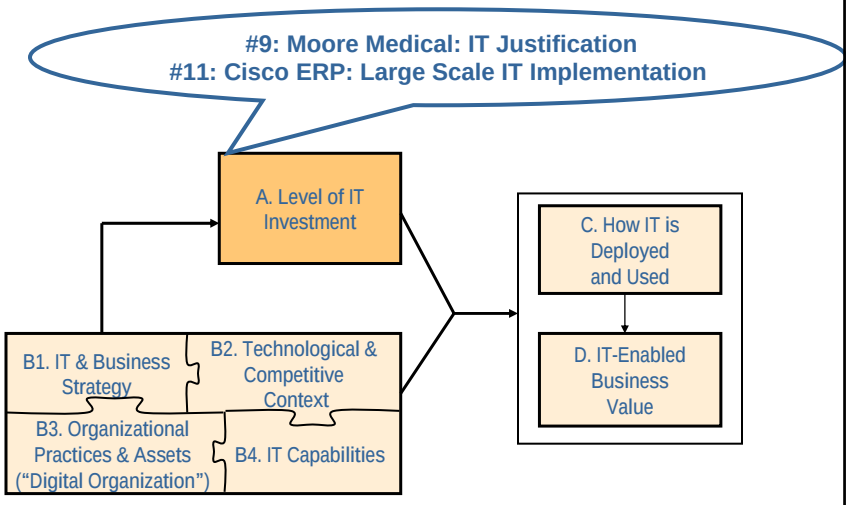


# Business Value of IT Framework



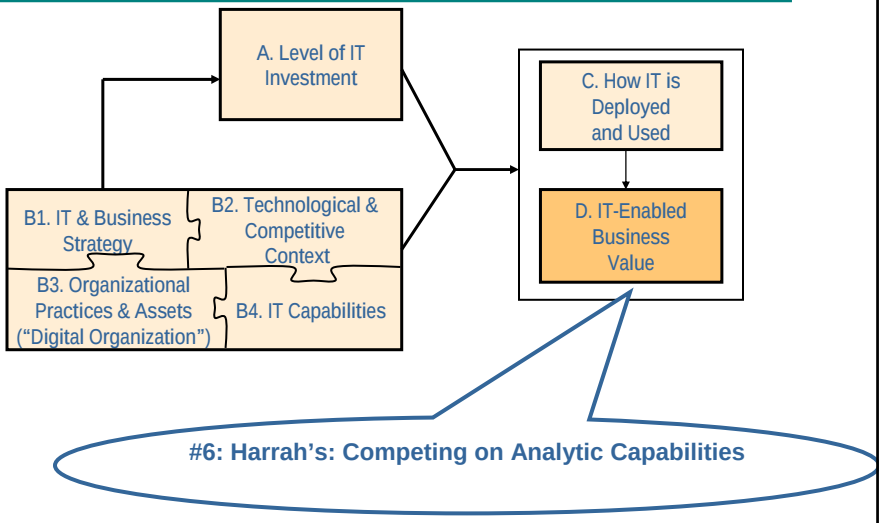

***What key factors affect the level of business value produced by a given level of IT investment?***

# BV Framework: A. Level of IT Investment



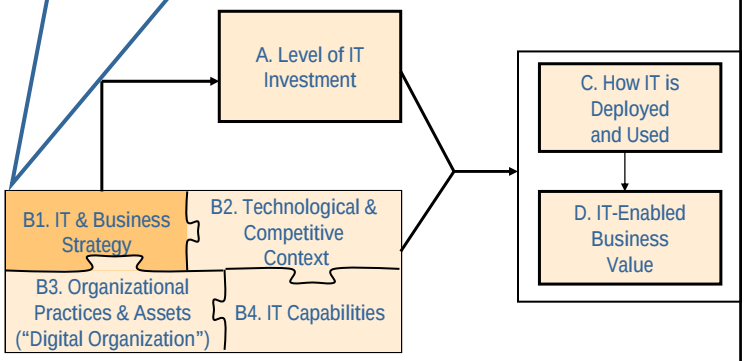



# BV Framework: D. IT Enabled Business Value



# BV Framework: B1. IT & Business Strategy

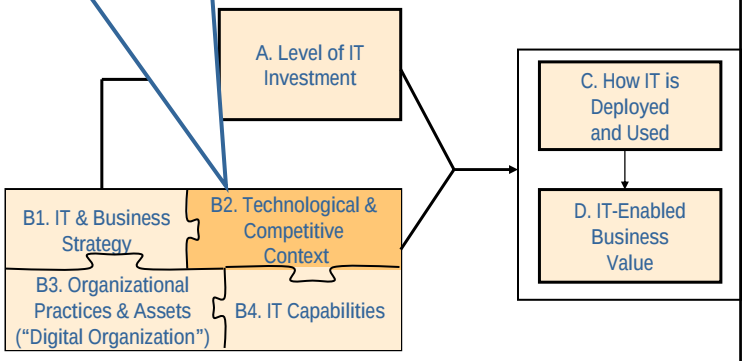
#3: NetFlix: IT Enabled Business Models
#4: Dell: Using IT for Competitive Advantage
#5: Apple: Navigating Industry Transitions



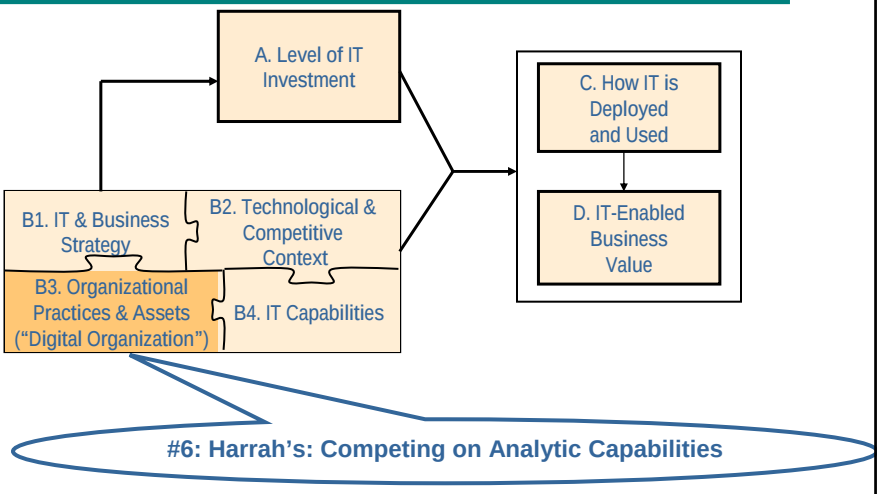



# BV Framework: B2. Tech & Competitive Context

#1: Friedman: Ten World Flatteners
#2: Five Distinctive Characteristics of IT
#4. Dell: IT for Competitive Advantage



# BV Framework: B3. Org. Practices & Assets



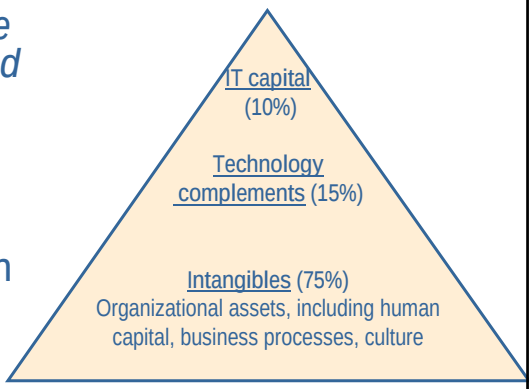



# B3. Org. Practices & Assets (cont.)

- IT is embedded in a cluster of related innovations that comprise the "digital organization":
  - Automation of routine tasks
  - Highly skilled labor
  - Decentralized decision making
  - Improved info flow vertically & laterally
  - Strong performance-based incentives
  - Increased emphasis on training and recruitment

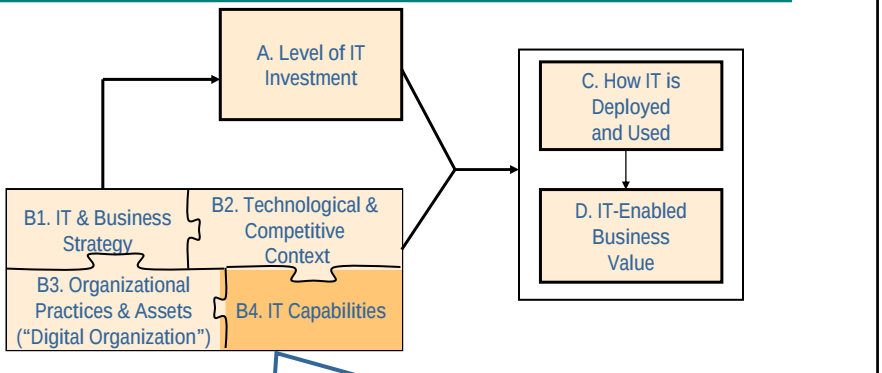
## B3. Org. Practices & Assets (cont.)

- *"For every dollar of IT hardware capital…there are up to $9 of IT-related intangible assets…" [Brynjolfsson 2003]*
- Only 20% of the firms studied by Brynjolfsson are "digital organizations" What's wrong with the other 80%?






## BV Framework: B4. IT Capabilities

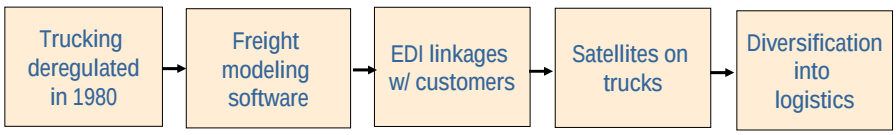



**#8: Pinnacol: IT Delivery Strategies**
**#9: Moore Medical: IT Justification**
**#11: DKW: IT Adoption and Implementation**
**#11: Cisco ERP/Large Scale IT Implementation**

# What are IT Capabilities?

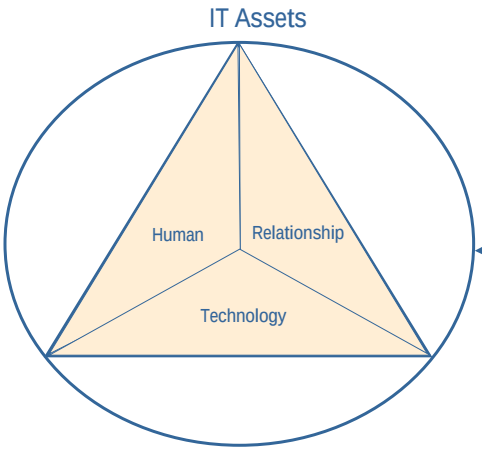
- An effective IT capability:
  - *The ability to control IT-related costs, deliver systems when needed, and effect business objectives through IT implementations* [Ross et al 1996]

The Schneider National Story [Ross et al 1996]






# BV Framework: IT Capabilities

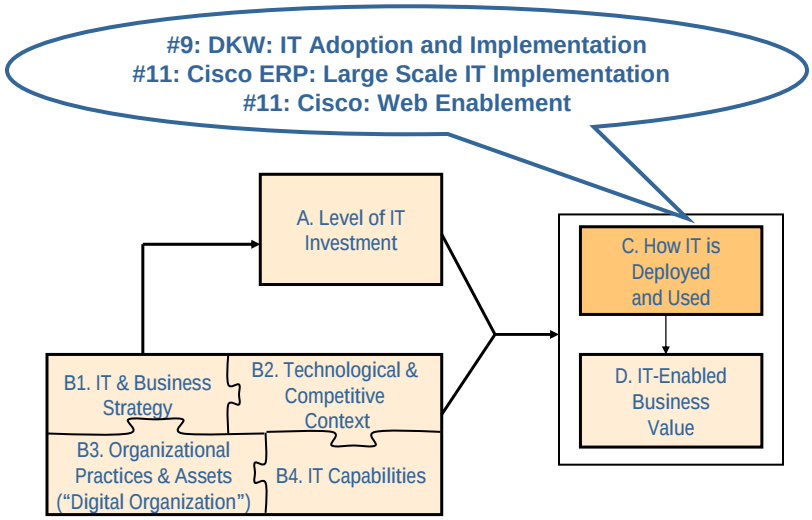



Adapted from Ross *et al.* 1996

IT Processes

- Developing & articulating IT strategy
- Defining the IT architecture
- Valuing & justifying IT investments
- Developing custom systems
- IT project management
- Implementing technology & managing change
- Operating IT systems efficiently and reliably

# BV Framework: C. How IT is Deployed






# Conclusions

- *Business value* (D) does not automatically flow from *IT investments* (A)
  - Investment has to be joined with favorable positions on four related organizational elements (B1-B4)
  - The resulting IT systems have to actually be assimilated, and joined with initiative-specific organizational changes (C)
- Certain general *organizational practices and assets* (B3) complement most kinds of IT investment
- IT Capabilities (B4) can be judged by *results*, but they are *driven* by valuable IT assets and valuable IT processes
  - *Non-IT managers* play a crucial role in building and sustaining valuable IT assets and processes