

# DevOps and Beyond: TOC for Software, IT and Technology Operations

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**BREAKTHROUGH RESULTS FOR  
GOVERNMENT AND BUSINESS**

# Challenges Development and Operations

Kmart was already losing its competitive position to Walmart and Target when it began a \$1.4 billion IT modernization project in 2000. By 2001 it had realized that the new system was so highly customized that maintenance would be prohibitively expensive. So it launched a \$600 million project to update its supply chain management software. That effort went off the rails in 2002, and the two projects contributed to Kmart's decision to file for bankruptcy that year. The company later merged with Sears Holdings, shedding more than 600 stores and 67,000 employees.

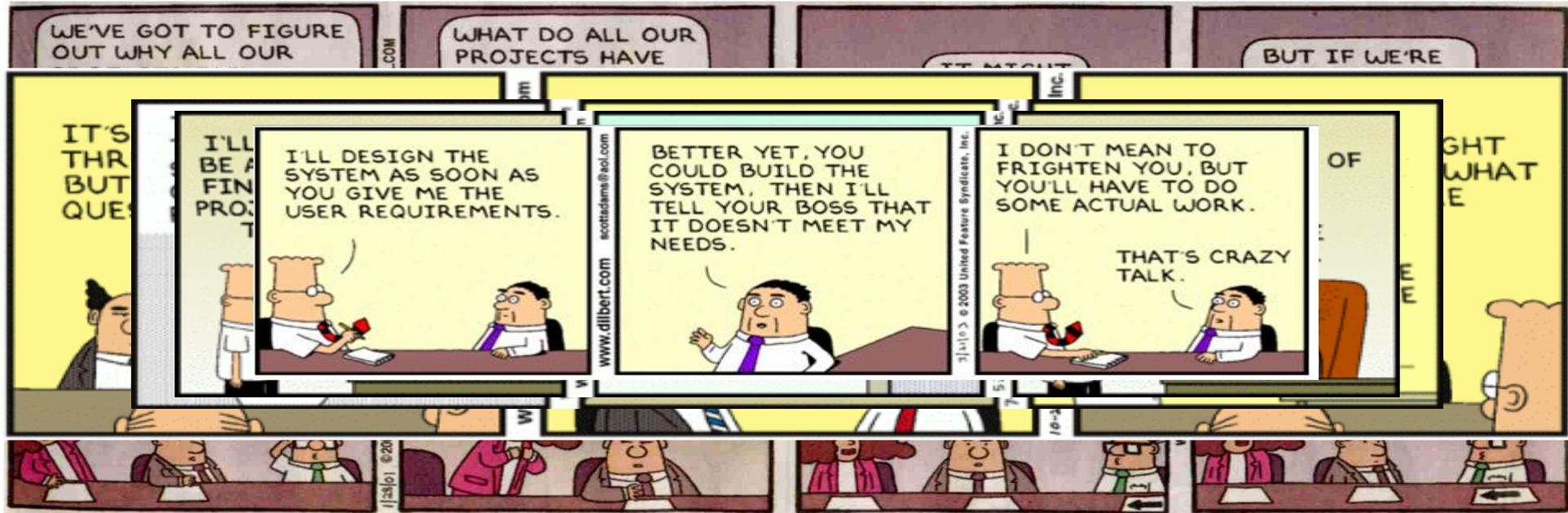
HealthCare.gov, the \$630 million online insurance marketplace, was a disaster after it went live on Oct. 1, with a roster of engineering repairs that would eventually swell to more than 600 items. The private contractors who built it were pointing fingers at one another. ...For 90 excruciating minutes, a furious and frustrated president peppered his team with questions, drilling into the arcane minutiae of web design as he struggled to understand the scope of a crisis that suddenly threatened his presidency \*

“Fully one in six of the projects we studied was a black swan, with a cost overrun of 200%, on average, and a schedule overrun of almost 70%.”\*\*

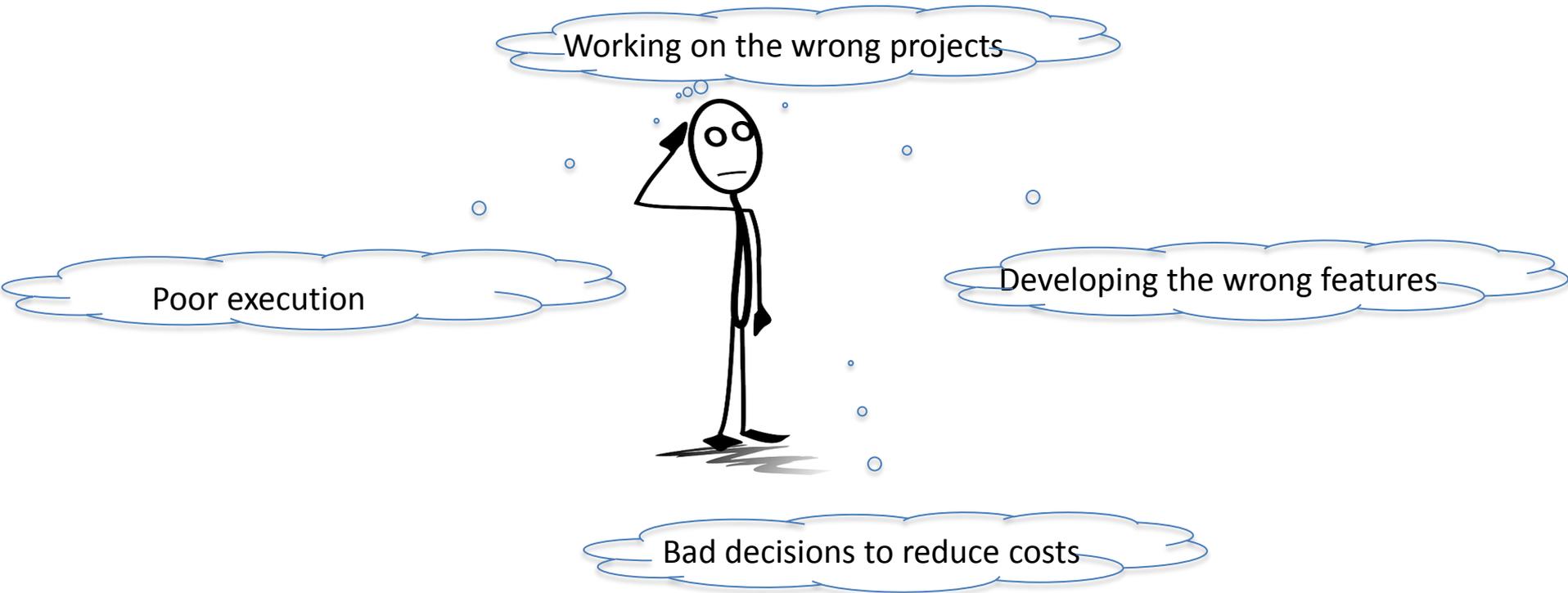
\* New York Times, Nov 30, 2013

\*\*HBR – Why your IT project may be riskier than you think

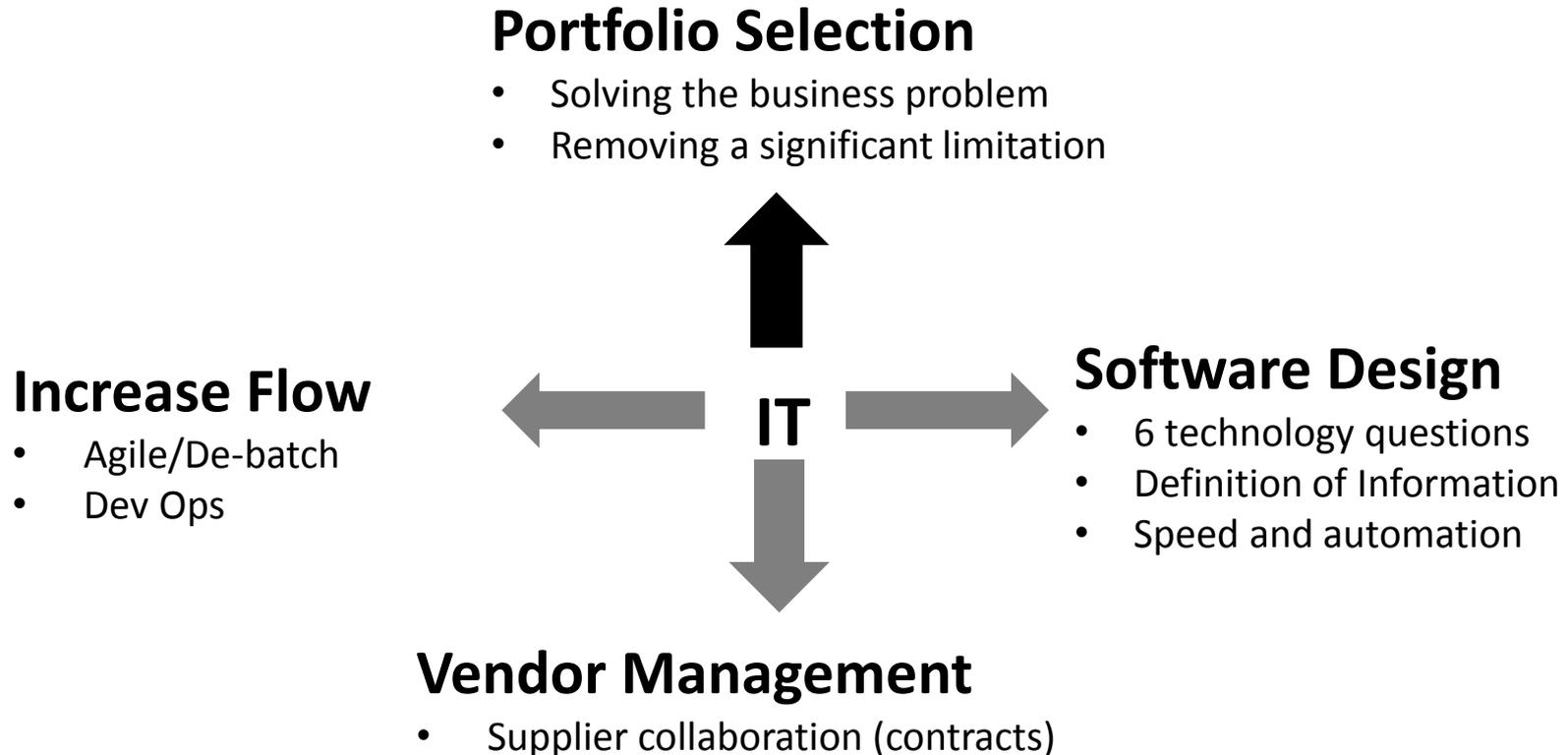
# Challenges Development and Operations



# Major reasons for failure



# TOC application for the CIO



# Creating Success



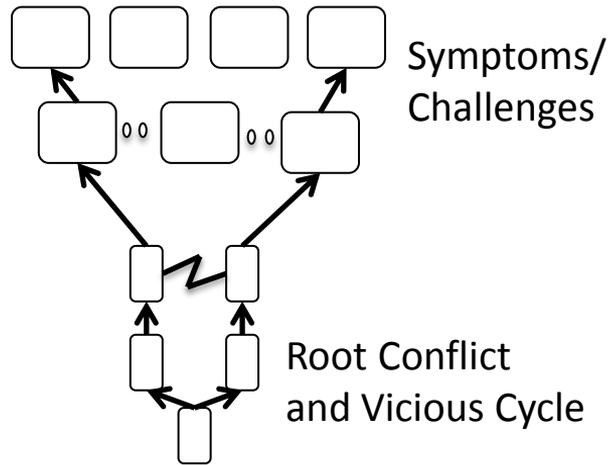
“People think focus means saying yes to the thing you've got to focus on. But that's not what it means at all. It means saying no to the hundred other good ideas that there are. You have to pick carefully.”

-Steve Jobs

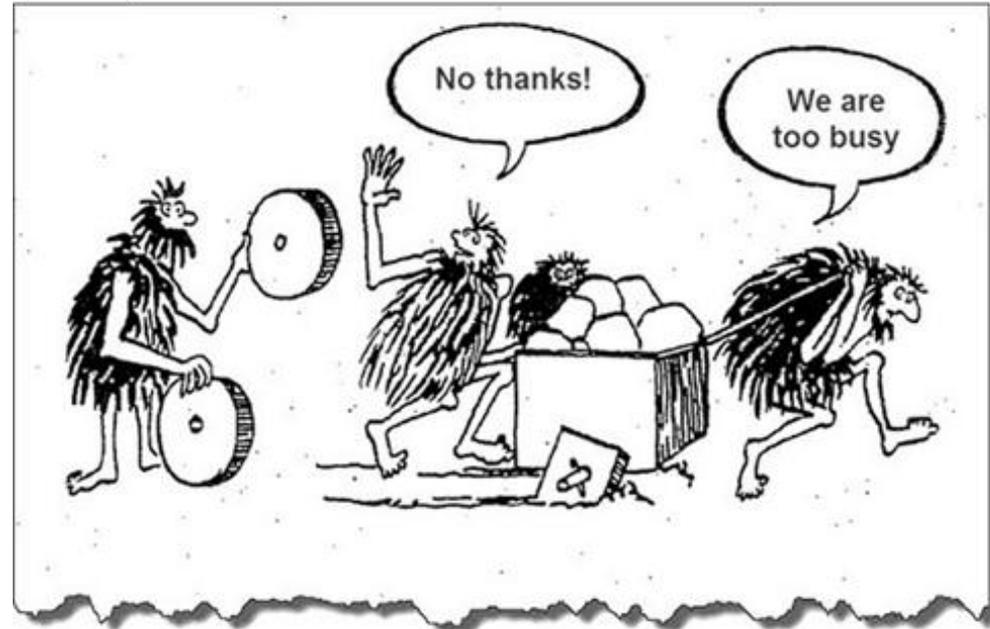
“**Focus**” is the critical factor in business success

# Solve the right problem

## Core Business problem



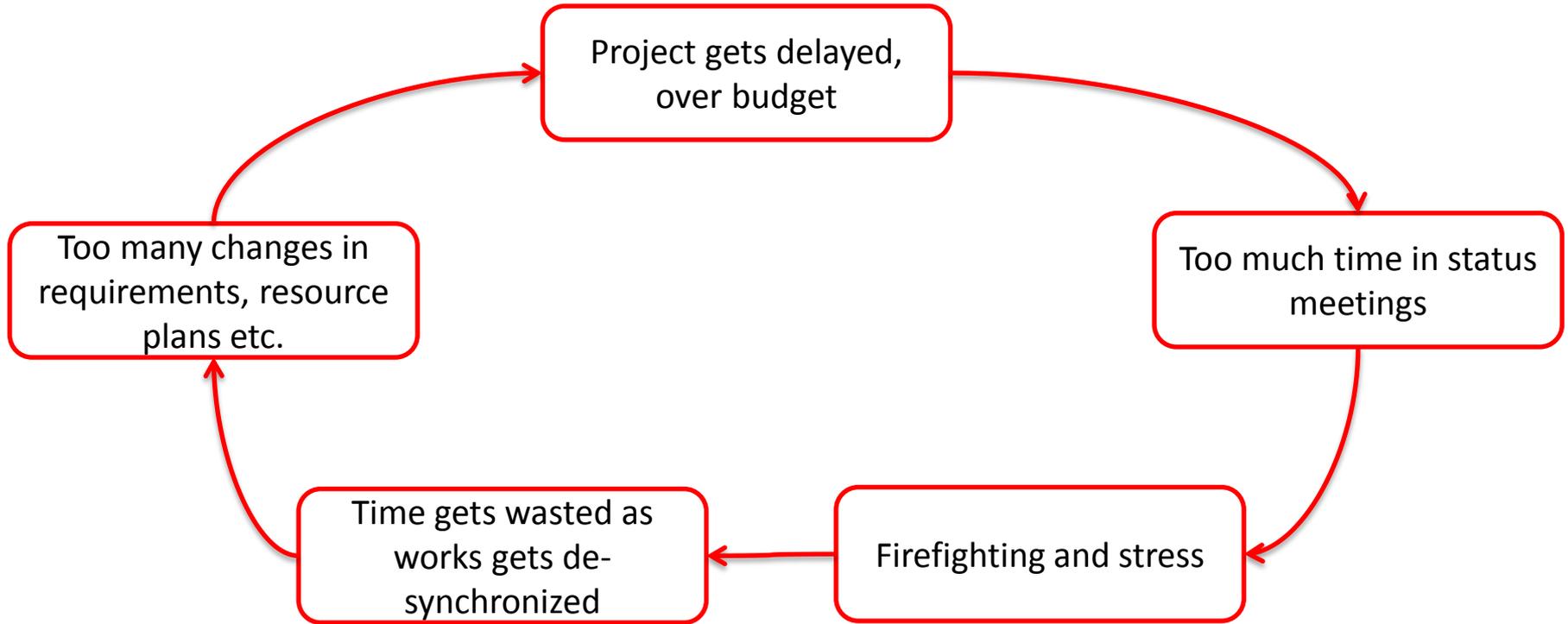
## Remove a significant limitation



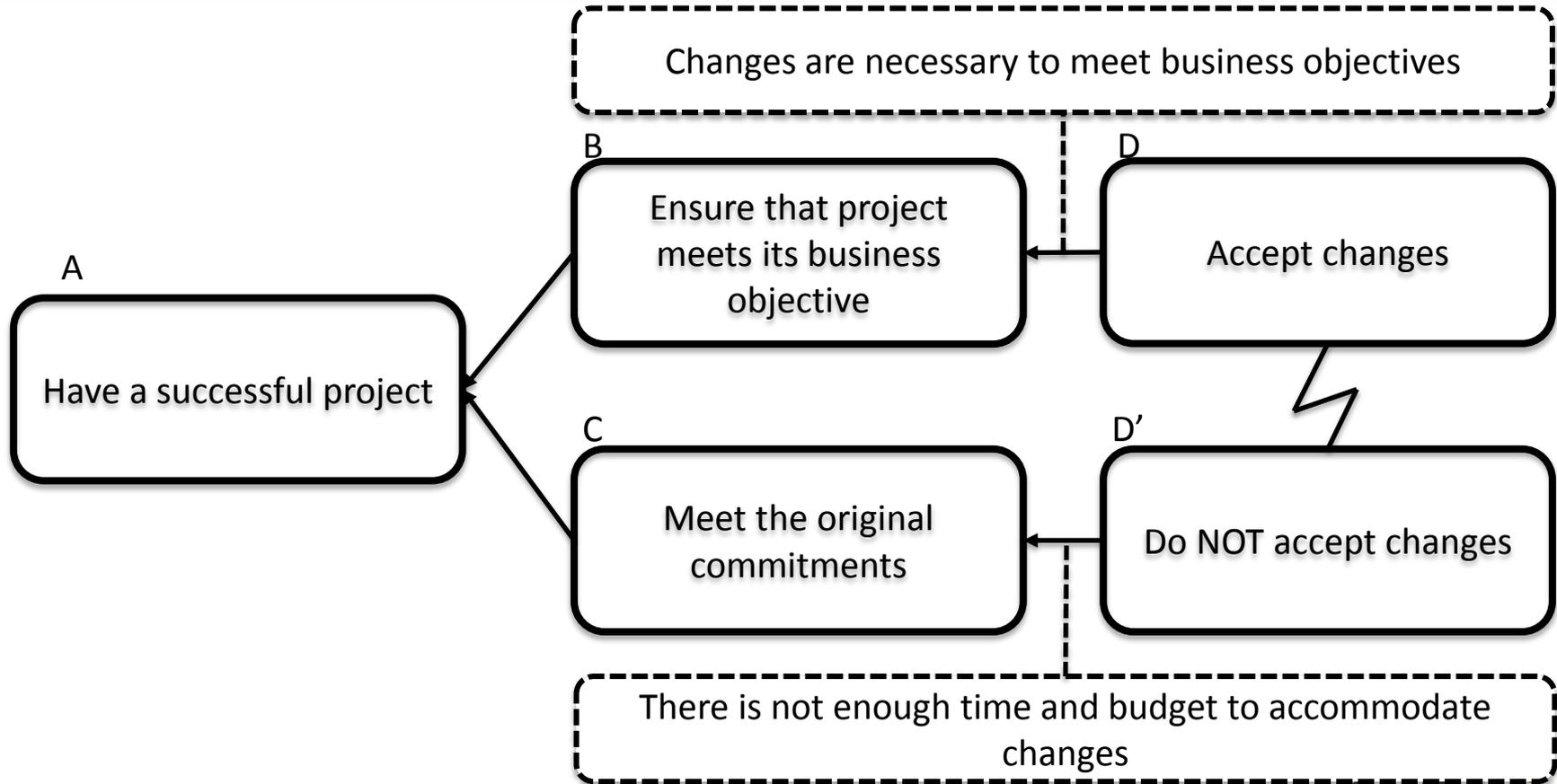
# Challenges in Managing Projects

- Projects are late, over budget and do not deliver on promises
- Time lines and budget are squeezed during planning
- Requirements keep changing
- Resources are not available as planned
- Priorities keep changing
- Firefighting and stress trying to make project successful
- Too much time spent in status update meetings
- Sometimes there is too much work, sometimes not enough
- ...

# Vicious Cycle



# Core Conflict



# Multitasking Exercise

Round 1

MULTITASK  
123456789

Round 2

M1U2L3T4I5T6A7S8K9

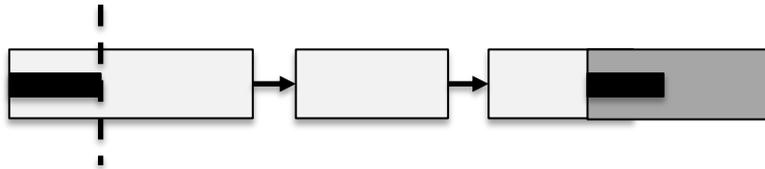
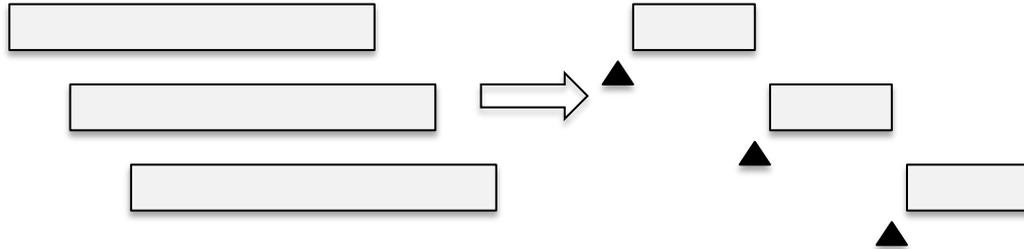
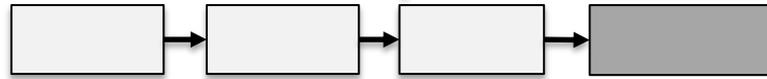
# Assumption to challenge

There is not enough time and capacity to accommodate changes

In reality

There may be enough time and capacity to accommodate changes, it is getting wasted

# Elements of CCPM



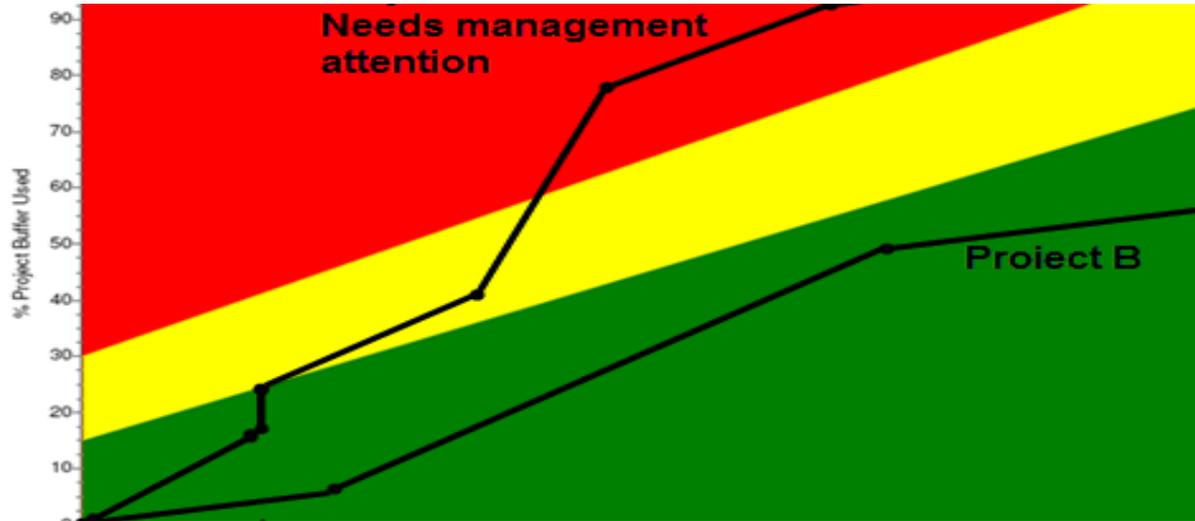
1. Aggregate Buffers

2. Low WIP and Full Kit

3. Remove local date metrics,  
implement buffer  
management

The behavior we want to induce is relay runner behavior where the entire team is functioning as one unit protecting the buffer

# Protecting the Buffer



Focusing management attention on the right project at the right time

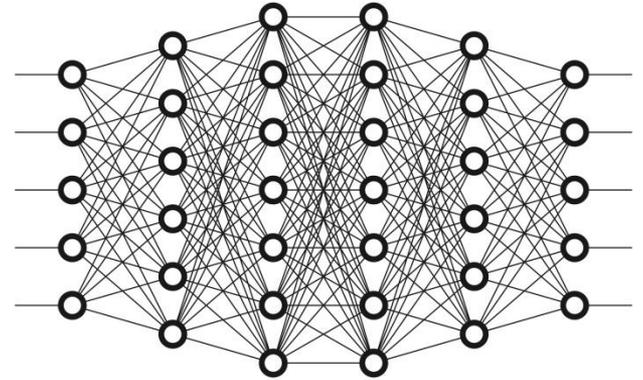
# Removing a Limitation

***“Value is created by removing a significant limitation for the customer, in a way that was not possible before, and to the extent that no significant competitor can deliver.”***

*Dr. Eliyahu M. Goldratt*

# Common Products and Limitations

Google



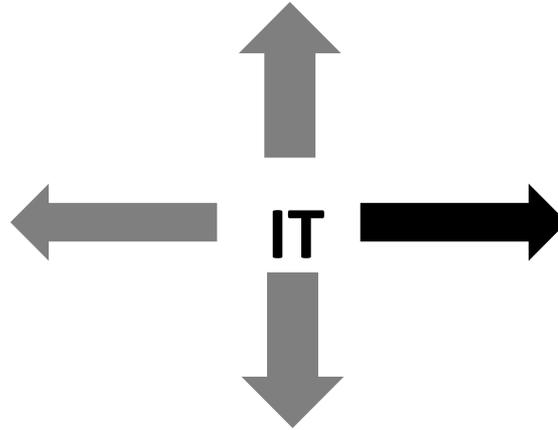
# TOC application for the CIO

## Portfolio Selection

- Solving the business problem

## Increase Flow

- Agile/De-batch
- Dev Ops



## Software Design

- 6 technology questions
- Definition of Information
- Speed and automation

## Vendor Management

- Supplier collaboration (contracts)

# Necessary and Sufficient

***“Value is created by removing a significant limitation for the customer, in a way that was not possible before, and to the extent that no significant competitor can deliver.”***

*Dr. Eliyahu M. Goldratt*

1. Technology can bring benefit if and only if it diminishes a limitation
2. Long before the development of the technology we developed Rules to help us accommodate the limitation

**What benefit will the technology bring us if we neglect to change the Rules?**

# Questions on Value – MRP example

1. What is the main power of the technology?

*Do dependent calculations required quickly and correctly*

2. What limitation does it diminish?

*The time it took to do net requirement calculations correctly*

3. What rules help us accommodate the limitation?

*Run net requirements once a month*

4. What rules should we use now?

*Run net requirements once a week*

# Typical Supply Chain Problem



**Need to protect sales**  
**Shortages are painful!**  
**More Inventory!!**

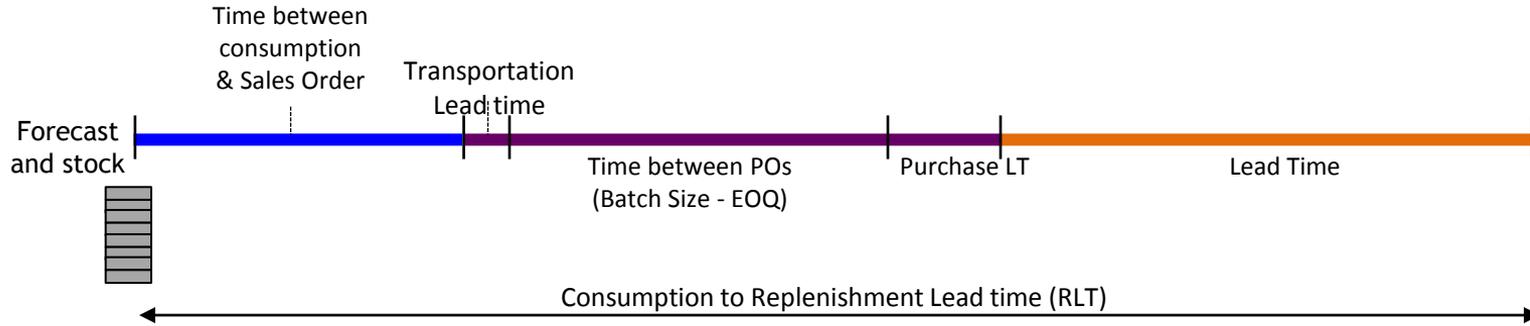
**Need to control budget/costs**  
**Surpluses are painful**  
**Less Inventory!!**

*Both shortages and surpluses are a challenge*

# Supply Chain Challenges

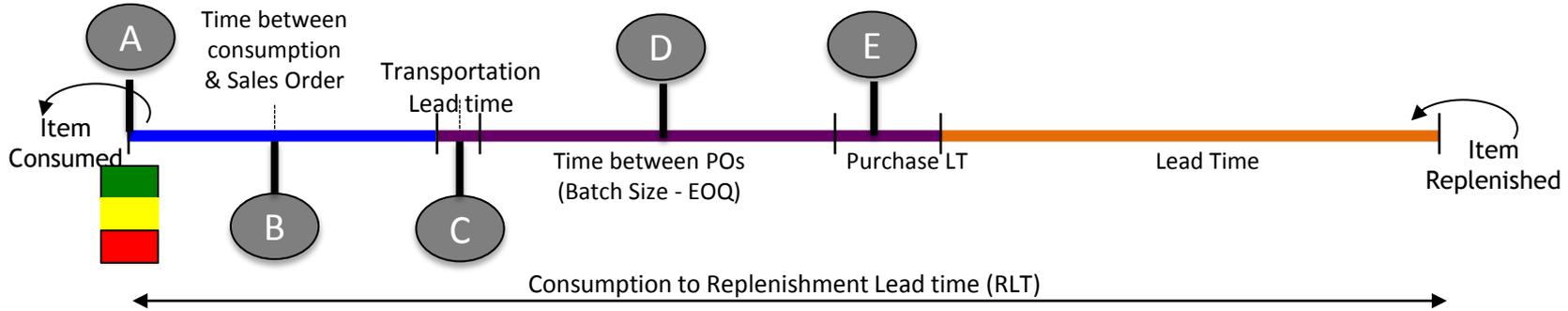
- Difficult to follow emerging trends
  - Long cycle time – requires to predict the next trend
- Inability to react to market feedback
  - By the time we get feedback about shortages it is already too late to react
- Inventory does not match demand
  - Shortage of what is selling
  - Surplus of slow movers – occupies shelf space and delays introduction of new items
  - Outlets packed with inventory yet pressure to have more!!
  - Expiry of goods, obsolescence costs go up
  - Frequent re-planning (firefighting)
- Financial
  - Cash tied up for long periods
  - Lower ROI; lower inventory turns
  - Additional Carrying / Warehousing costs

# New Technology in Supply Chain



- Point of sales data
- Rapid calculations of consumption

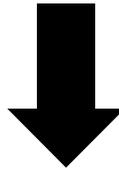
# Velocity with IT



- A Forecast demand or manage buffers - Decisions**
- B Data flow speed up – get accurate point of sales data - Automation**
- C Dispatch trucks with smaller batches for each SKU- Decisions**
- D Challenge Economic Order Quantities**
- E Create Long Term Contracts and automate ordering to speed up - Automation**

# What rules blocks the benefit?

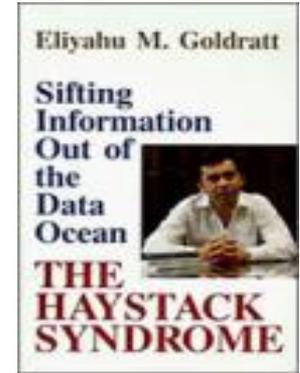
Every link in the supply chain wants to push inventory to the next link because they make money when the next link buys



Nobody get paid unless the end customer buys

# Drowning in Data

“We are drowning in oceans of data. The situation is so bad that in public appearances, whenever I raise the suggestion of connecting the printers directly to the shredders, the audience responds with laughter and cheers. Somewhere along the line we have taken a wrong turn. Somewhere along the line there must be a logical flaw. “ - The Haystack Syndrome



“Management Attention is  
the ultimate Constraint.”



*Dr. Eli Goldratt*

# Data processing grows exponentially



We are drowning in oceans  
of data



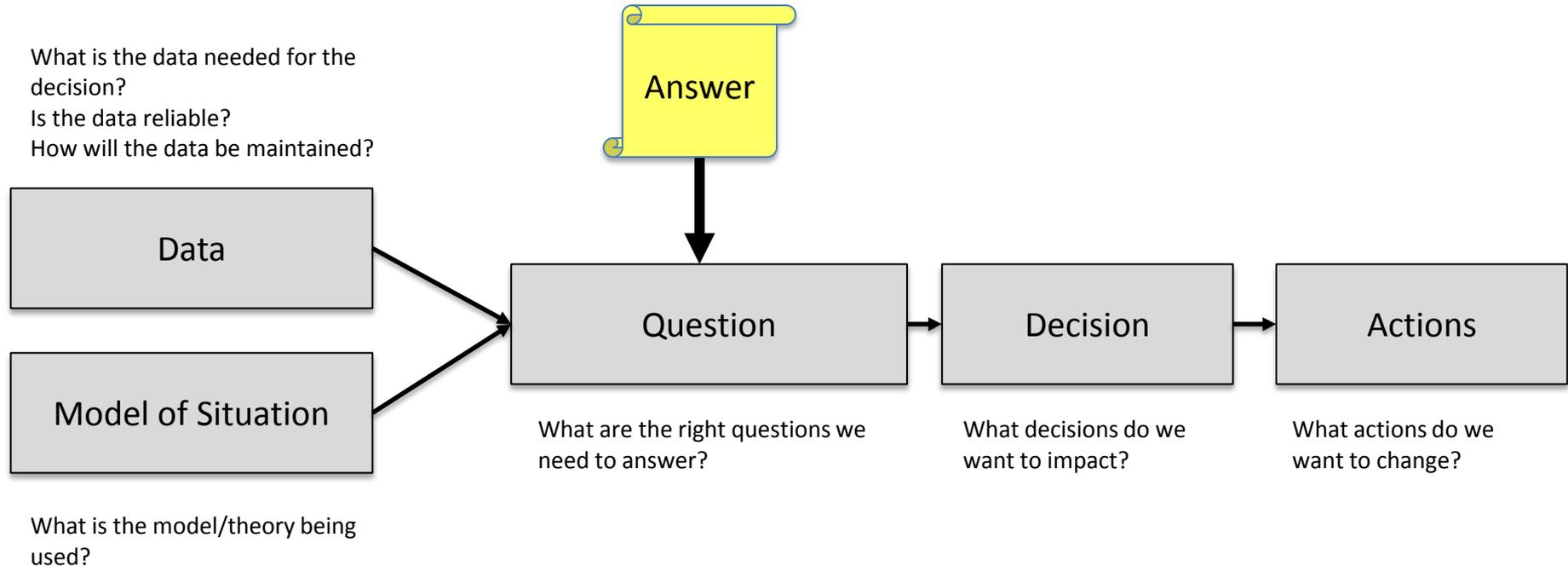
We need a magnet to extract the right  
information

**Definition:** “Information” is the **answer** to the question asked!

-Goldratt

*What work do we have to do to ask the right questions?*

# How to provide the right information



# Scenario 1

**Result:** Increase profits for a company

**Situation:**

- Company ABC sells two products P and Q
- P and Q both sell for \$100 dollars. They both use \$40 in raw materials.
- P consumes 8 Hrs of Labor to produce
- Q consumes 16 Hrs of Labor to produce

**Decision:** Should I sell P or Q

# 5 Focusing Steps

1. Identify the constraint
2. Exploit the constraint
3. Subordinate everything else to the constraint
4. Elevate the constraint
5. Go back to Step 1 (don't allow Inertia to set in)

# Scenario 2

**Result:** Increase profits for a company

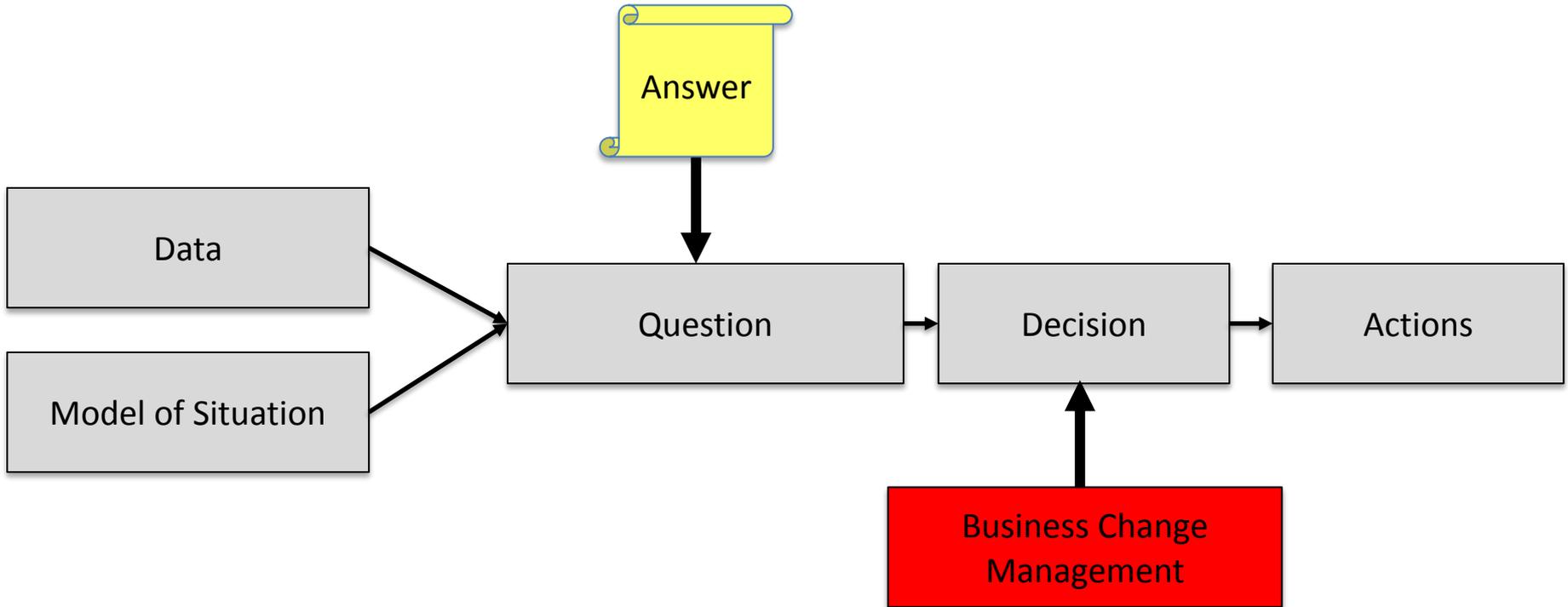
**Situation:**

- Company ABC sells two products P and Q
- P and Q both sell for \$100 dollars. They both use \$40 in raw materials.
- P consumes 8 Hrs of Labor to produce
- Q consumes 16 Hrs of Labor to produce
- P consumes 2 Hrs on the Constraint
- Q Consumes 1 Hrs on the Constraint

**Decision:** Should I sell P or Q

# Will the results change?

*Probably NOT!*



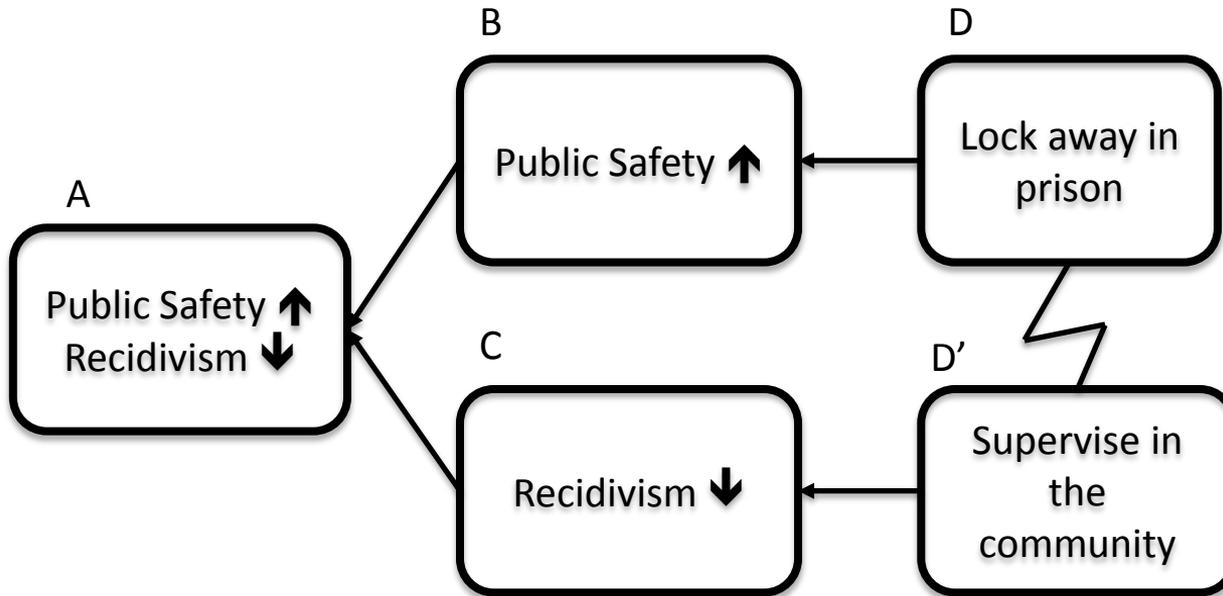
# Change Management

***Change management is the constraint in designing and making simple IT solutions that deliver value***

1. Technology can bring benefit if and only if it diminishes a limitation
2. Long before the development of the technology we developed Rules to help us accommodate the limitation

**What benefit will the technology bring us if we neglect to change the Rules?**

# Data Integration – Criminal Justice



- Corrections and probation officers are the constraint in the system
- Probation officers create reports to evaluate risk by looking at all the data for an offender
- These reports are used by the judge to make an informed sentencing decision
- Creating these reports is time consuming and not “blue light”

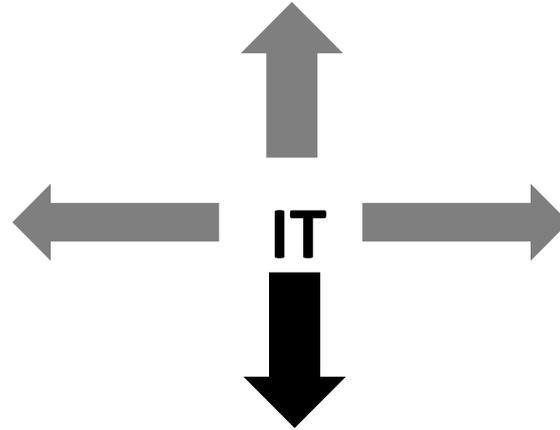
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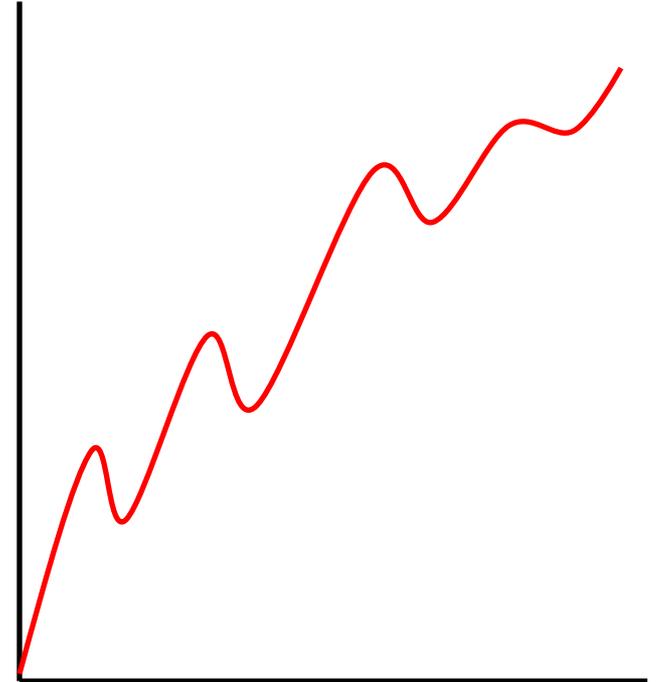
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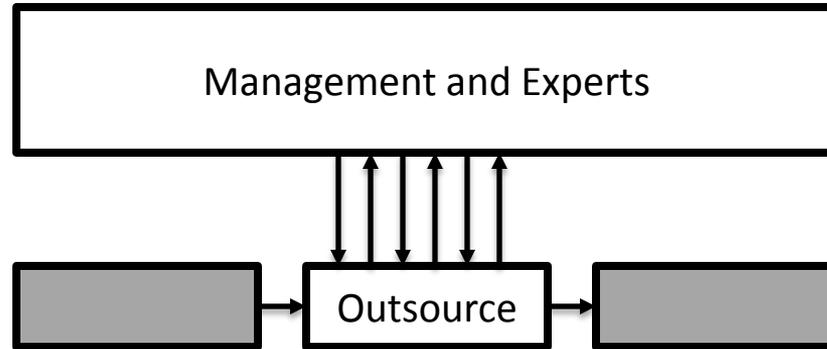
## Vendor Management

- Supplier collaboration (contracts)

# Outsourcing trends



# Management Attention Impacts



- Flow can get worse
- Management attention is spread thin
- More gaps between business users and developers

Captive IT is a monopoly – outsourcing allows competition

# Cost Reduction Scenario

- Data
  - Captive organization (any profit / loss is transferred to parent company)
  - 100 Direct Labor, 50 indirect (developers, project managers, architects, management etc.)
  - Direct Labor Salary – 50K/ year
  - Indirect labor Salary – 100K/ year
  - Hours = 2000 MHrs/direct labor/year
- In house MHR rate =  $10 \text{ million} / (2000 \times 100) = 50\$/\text{hr}$
- Goal – is to reduce cost

# Impact of outsourcing

**Goal:** Reduce costs

**Cost Reduction:** A contractor offers to do 10% of work at 40\$/hr.  
(20% lower M Hr. rate than in-house M Hr. rate)

**Impact of decision:**

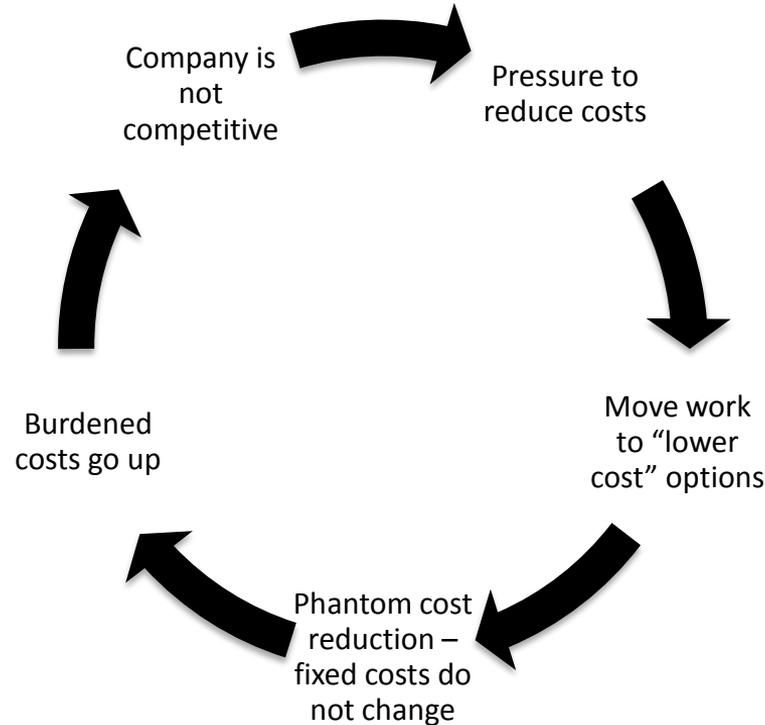
After outsourcing Internal Cost = 50K x 90 + 100 K x 50 = 9.5 million

Outsourcing cost = 10 x 2000 x 40 = 800 K

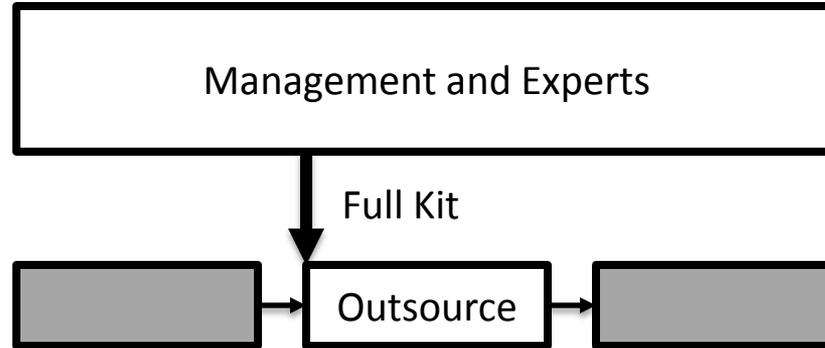
Total Cost = 9.5 million + 800 K = 10.3 million

In house M Hr rate = 9.5 million / (90 x 2000) = 52.8\$/hr

# Phantom Cost Reduction - Death Spiral



# Setting up outsourcing



- Define shorter sprints
- 'Full Kit' each sprint
- Align contract with win-win conditions for Full Kit and deliverables

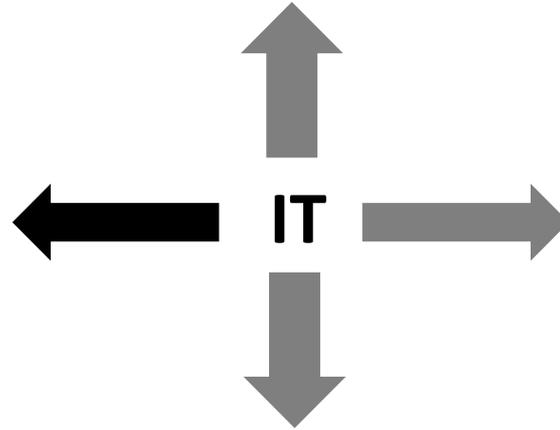
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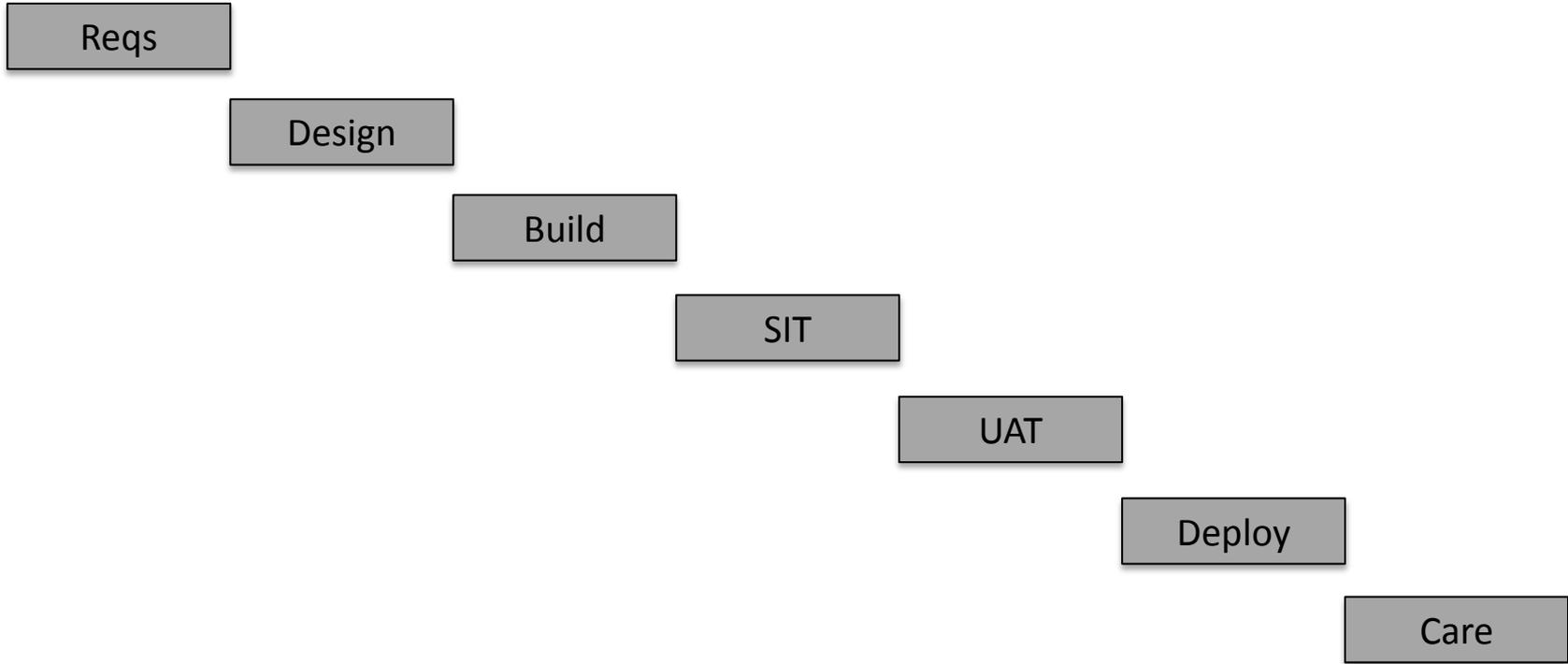
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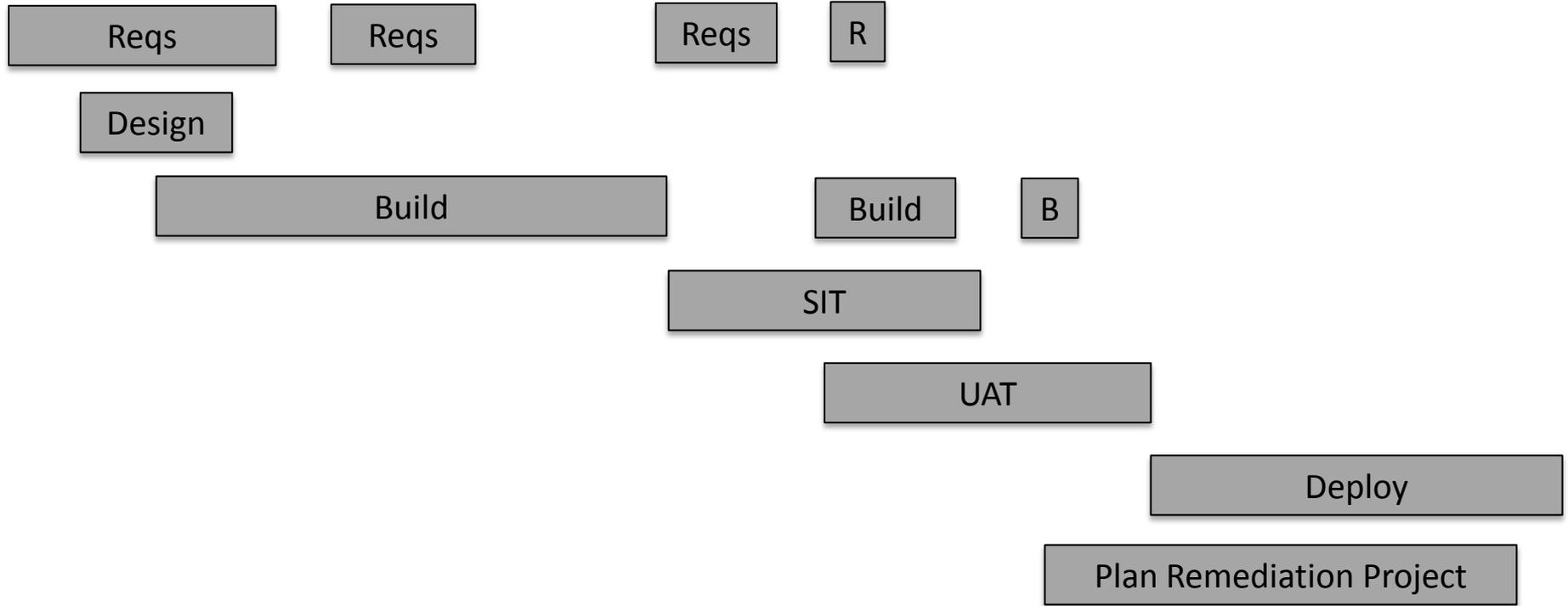
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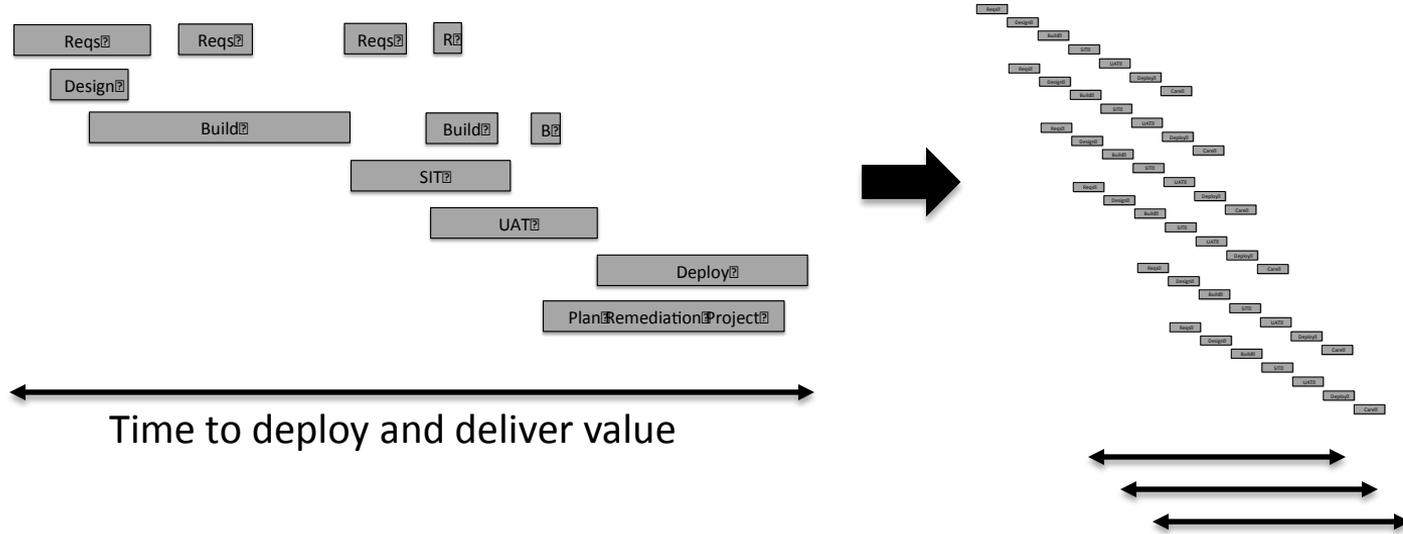
# Common IT project



# “Real” IT project

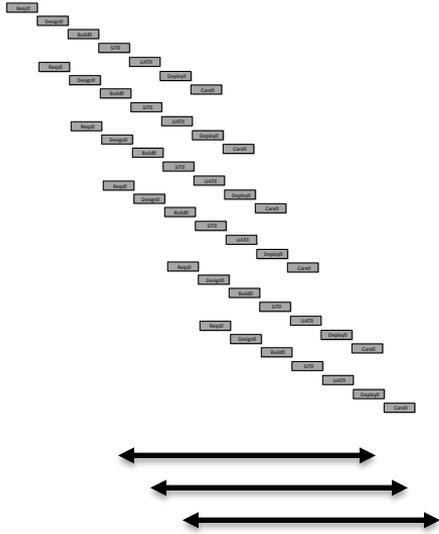


# What is the constraint in an IT project



- Challenge the Logic
- Challenge the “Batching” Policy
- Challenge “Own” SLA’s

# Exploit and Subordinate



## Exploit

- Design can often be broke into Logical Sub-Tasks
- **Might even be less efficient to develop!**
- Build/Development will be Synchronized to the Design Pieces

## Subordinate

- Testing Will Be Synchronized with Development
- Exposes Quality Issues Early
- Real-time Correction
- Right First Time into UAT
- Shorter UAT
- Much Happier Customers

# Questions

Thank You!