

# Total Architecture:

The Enterprise is the System

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# What is a System?

## □ Two common definitions

- A set of ***connected parts*** forming a complex whole
- A set of ***procedures*** according to which something is done

## □ We combine the definitions:

- A set of connected parts executing a set of procedures

## □ The system consists of:

- Participants (workers) performing activities
- Tools
- Information (data)
- Processes (procedures)

# What is a Computer System?

- **System in which all participants are technology-based components**
  - Computers and networks
  - Tools: printers, actuators, programmable machine tools
  
- **The technology components:**
  - Play the role of participants
  - Play the role of tools
  - Manage information
  - Execute the process

# The Role of Computers has Evolved

## □ From:

- Just being just a tool



## □ To:

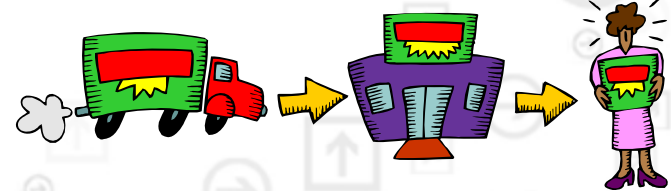
- Managing information



- Being a worker



- Executing the process



# An Example:

# Automobile Manufacturing



# In Early Automobile Manufacturing

- **The people do everything**
  - They are the workers
  - They decide how and when to use tools
  - They have the information
  - They know and execute the process



# As Technology Advanced, Automation Began

- **Assembly involves a mixture of people and machines**
  - Most of the workers are people, some are machines
  - People still decide how and when to use tools
  - People still have the information
  - Machines execute part of the process



# Today Some Processes are Completely Automated

- **Machines (driven by computers) do everything!**
  - They perform all the work
  - They decide how and when to use tools
  - They have and use the information
  - They execute the entire process



# Observations About the Automated Process

- **People design the process**

- Define the roles of the machines, the organization of the work

- **Each machine (computer) requires programming**

- Programming details the process

- **People do the most difficult exception handling**

- They are still part of the process

- **You can't design the process without understanding the machines**

- **You can't pick the machines without understanding the process**

# What is Architecture?



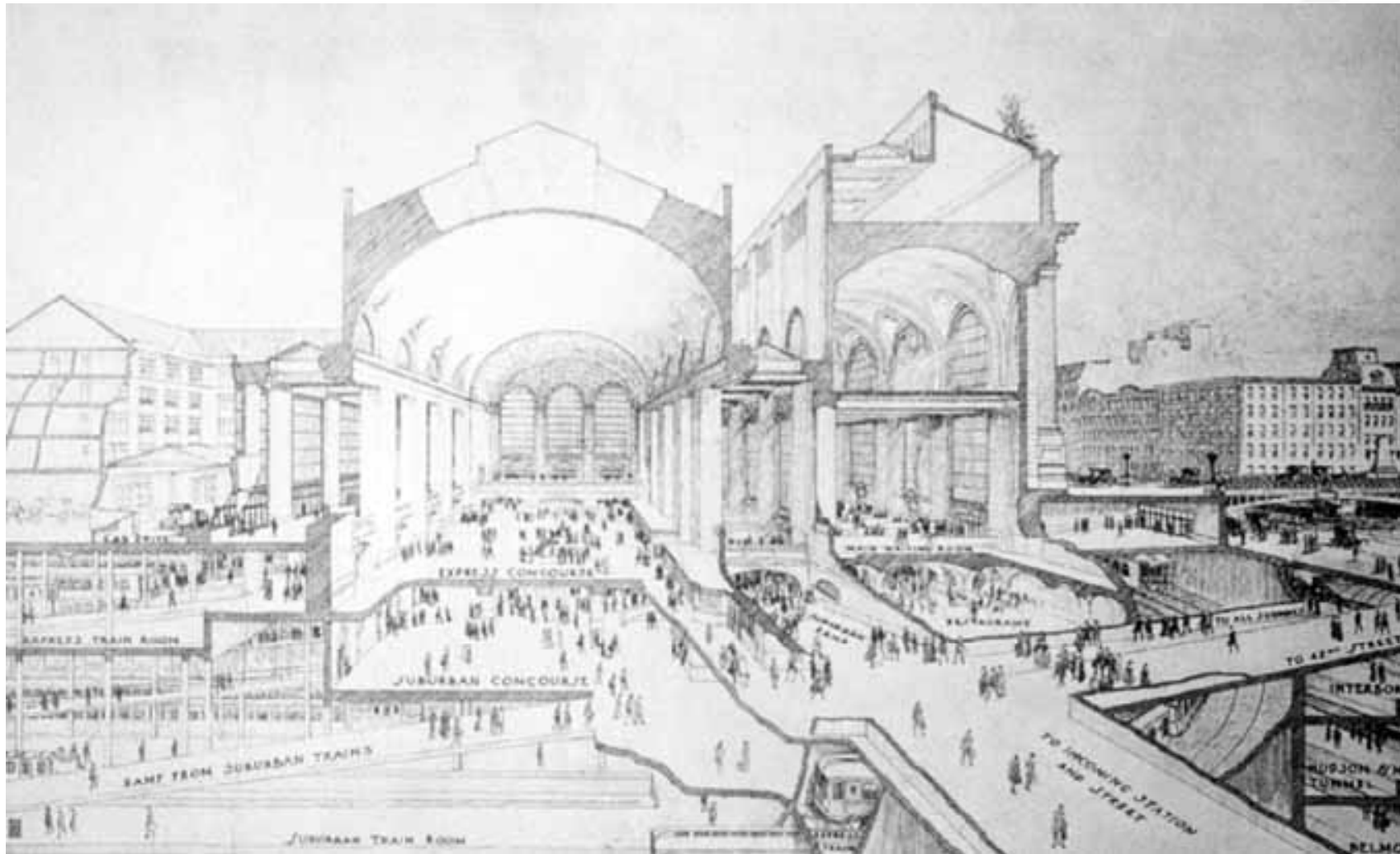
# Is it External Structure?



# Is it Internal Structure?



# Is it Organization?



# Is it Dynamics?

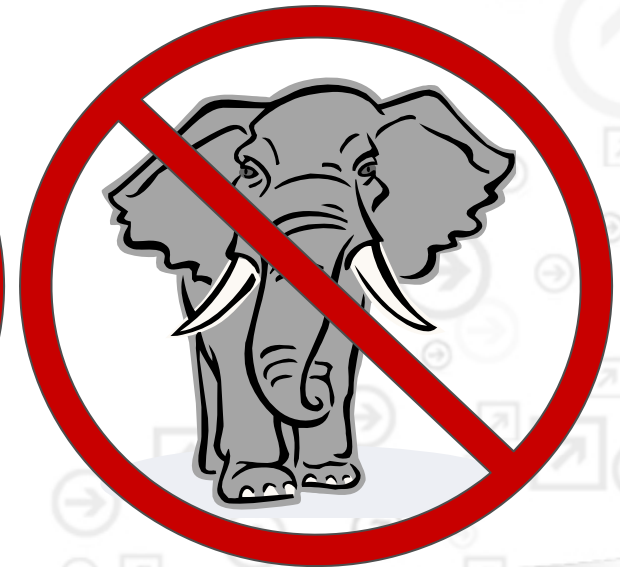


# Considering Dynamics Helps You Understand...

□ ...what is possible...

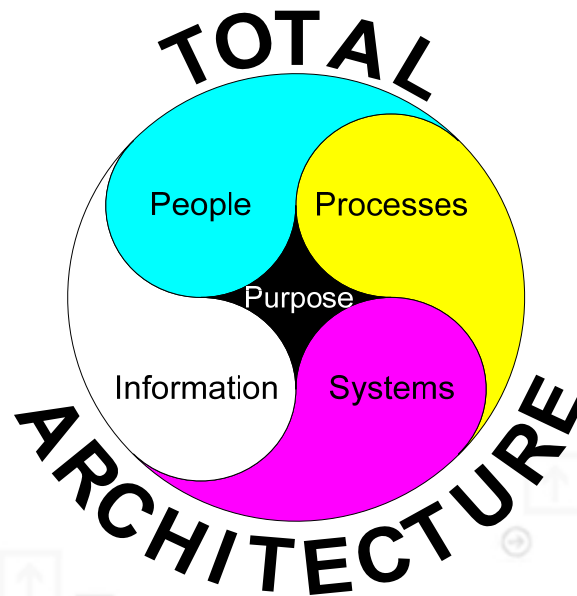


□ ...and what is not...



# Architecture is Structure with a Purpose

- **The purpose is to execute business processes**
  - Information is an important part of the process
- **The participants include both people and computers**
  - Organizations define the “architecture” of the people
- **You must consider the Total Architecture!**



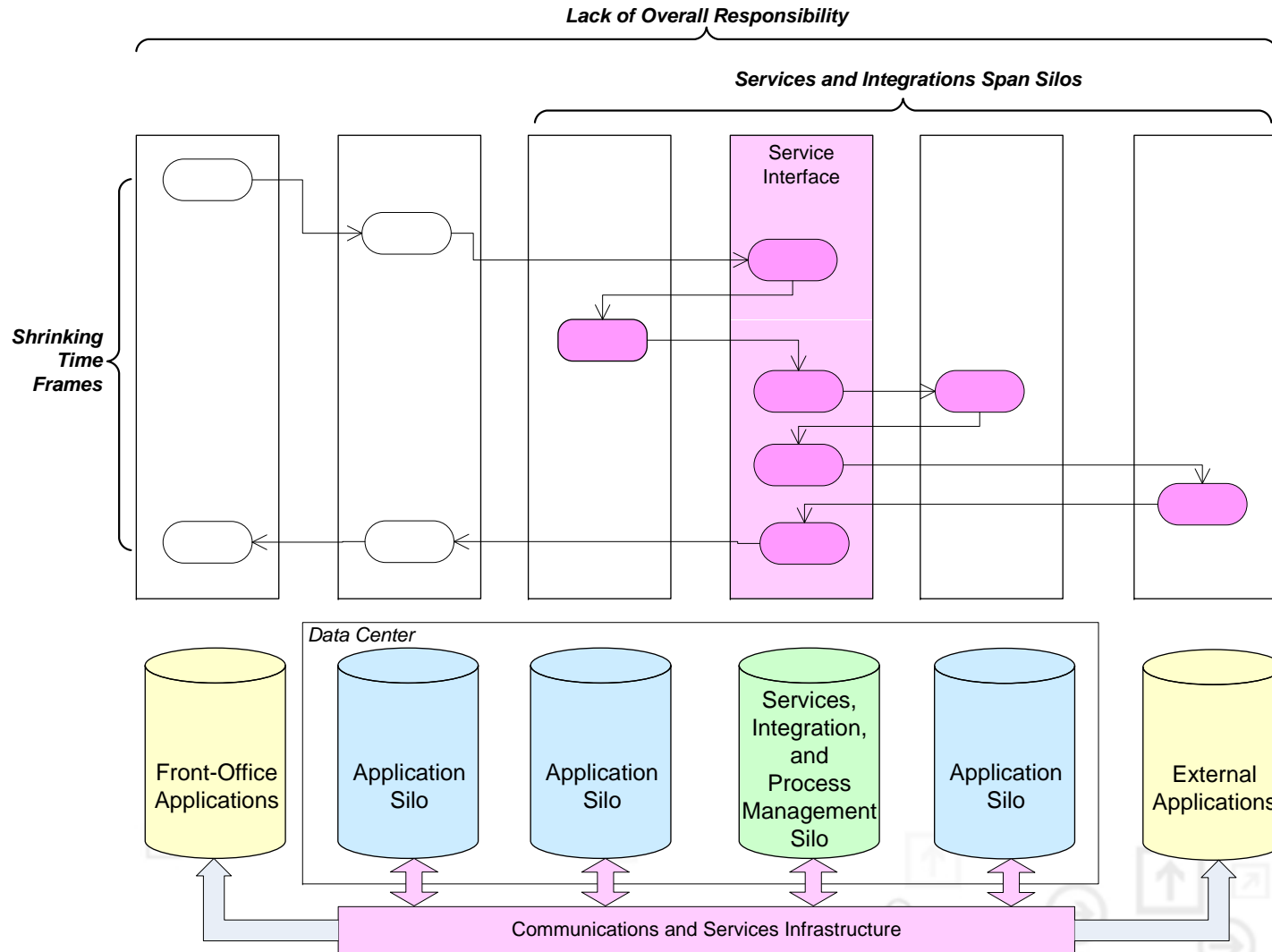
# Enterprise Architecture



# Business Processes are the Key to Total Architecture

- They are the mechanism for providing IT value
- They define the required collaboration between people and computers
  - Timing
  - Movement of information
  - Transfer of control (responsibility)
- **The value of the architecture lies in its ability to support business processes**
  - Current
  - Future

# Business Processes and Services Cross Organizational Boundaries

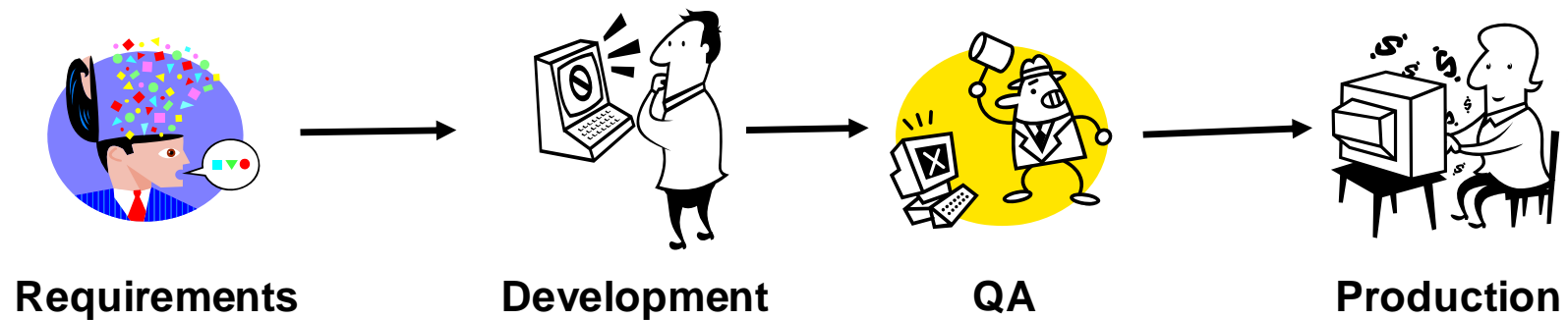


# Business Process Observations:

- ❑ **Business Processes define**
  - The roles of all participants – both people and computers
  - The flow of information
- ❑ **To design the process, you have to know the capabilities of existing computers**
- ❑ **The process design defines the requirements for new or modified computers**
- ❑ **You can't design the process without understanding the computers**
- ❑ **You can't design the computers without understanding the process**

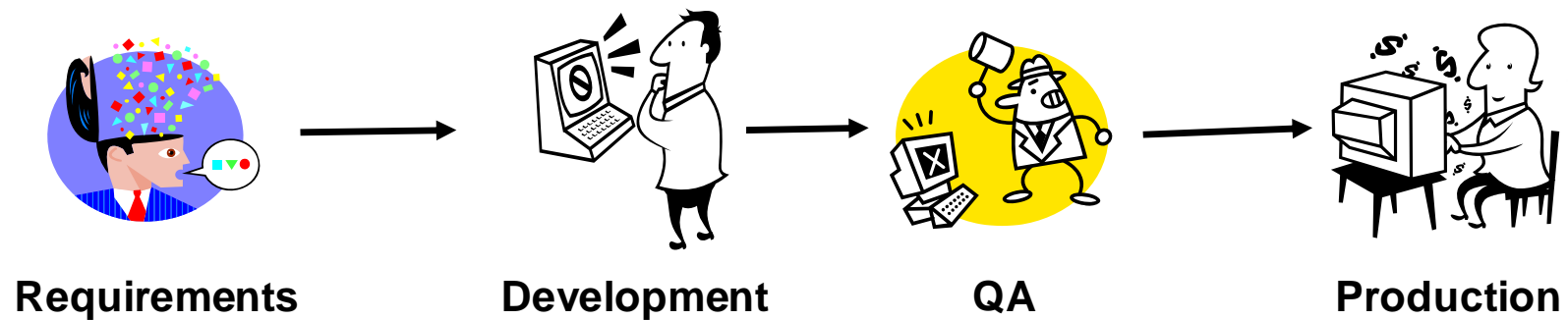
# Many Development Processes Have Become Degenerate

They assume a single system is being worked on

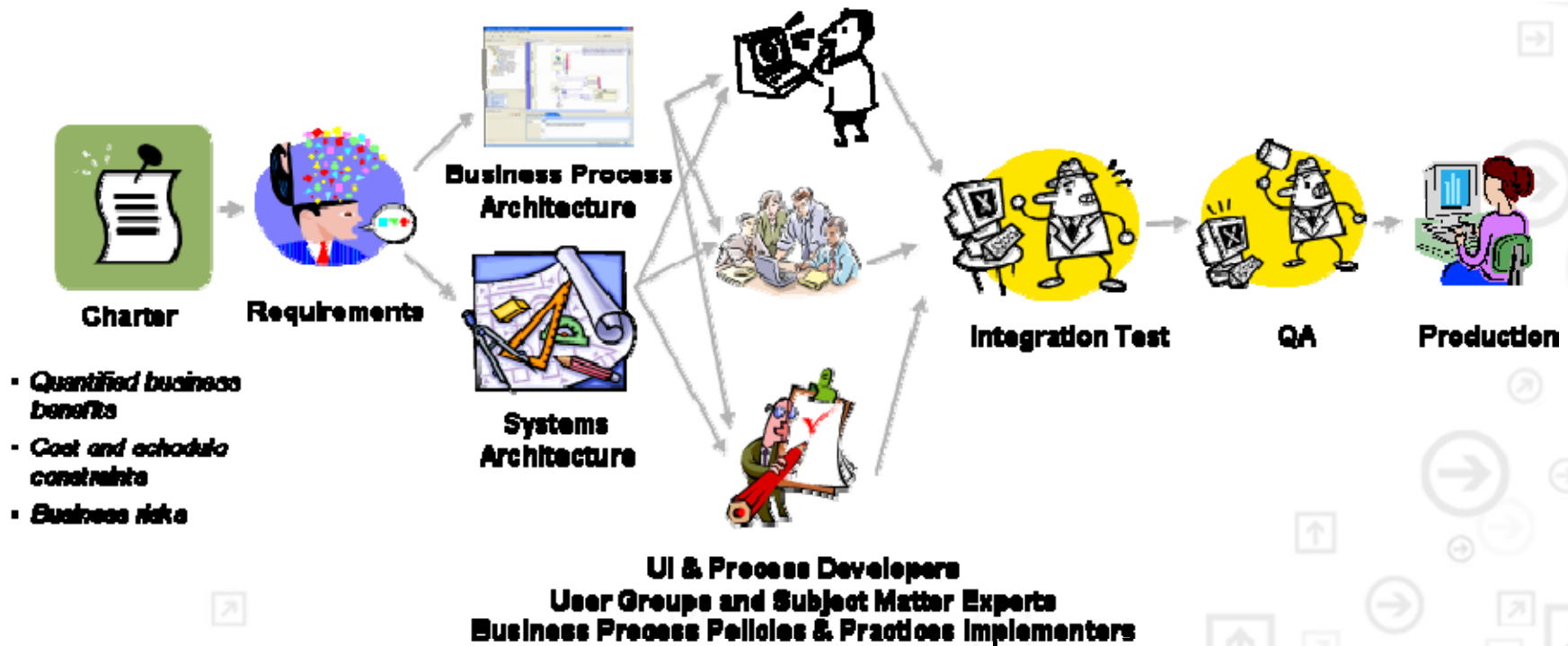


# Degenerate Processes Will Not Work for SOA and BPM

Multiple organizations and systems are involved

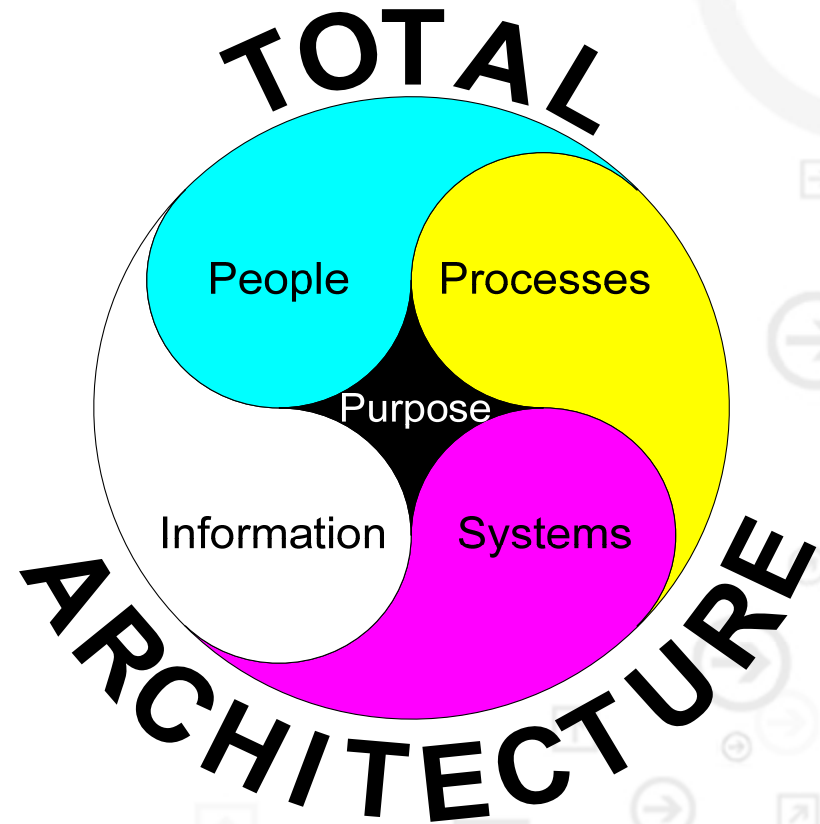


# A Richer Development Processes Is Required



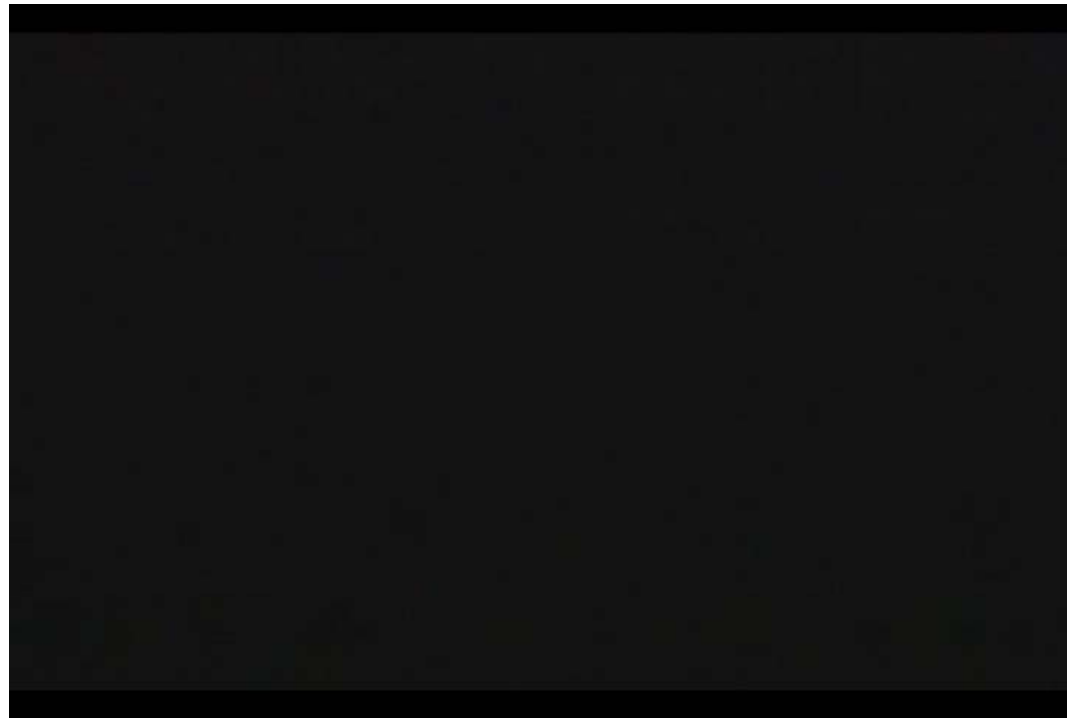
# A Total Architecture Perspective is Required

- **Business purpose**
- **Business processes**
  - Sales order management
  - Inventory management
  - Accounting
- **People**
  - Participants in the business processes
- **Information**
  - What information is being used
- **Computer systems**
  - Computers, networks, applications, infrastructure
- **How it is all organized**



# Enterprise Architectures Are Built Incrementally

- Each project builds a piece of the architecture
- Projects must be guided towards the goal
  - This is the role of the enterprise architects
- The enterprise must continue to operate!



# The Role of Enterprise Architects

- ❑ **Coordinating the work of projects to build a unified architecture**
- ❑ **Defining the organization of both people and computers**
  - The vision of how the enterprise will operate
- ❑ **Understanding the interactions between business processes**
  - The flow of reference and transactional data
  - The flow of control
- ❑ **Abstracting business processes patterns**
- ❑ **Architecting standard implementations**
  - Design patterns
  - Preferred implementation technologies
  - Reference implementations
- ❑ **Training and mentoring project architects**
- ❑ **Governing projects to ensure the total architecture is kept in focus**

# Total Architecture is More Than an IT responsibility

- **The business is responsible for organizational structure and responsibilities**
  - The “people” architecture
- **The interdependencies between people and computers makes it impossible to architect them independently**
  - Total Architecture must be a joint business-IT effort
- **It impacts both enterprise and project-level activity**
  - Enterprise establishes target architecture for both people and computers
  - Projects incrementally move towards that target while providing value through real business process improvements

# Total Architecture is NOT a Choice!

- It is a concession to reality
- Your enterprise is a system of people and computers
  - You need to think about the whole thing and how it works before you change it
- Ignoring the total architecture perspective leads to brittle solutions and inflexible architectures
- Embracing the perspective leads to efficiency
  - Current projects that deliver business results on-budget and on-time
  - Architectures that are able to evolve gracefully