

# ERP Meets Lean Management

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# High-Tech meets No-Tech!

## *ERP*

### *Digital*

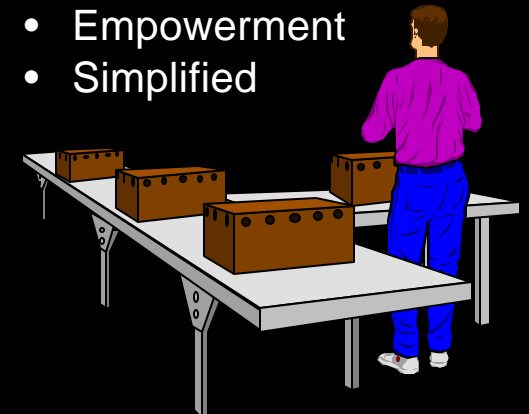
- Work Orders
- Push
- Data Entry
- Reports
- Security/Access
- Data Accuracy
- Complicated

**Spread  
Sheets**

## *Lean*

### *Visual*

- Flow
- Pull
- Kanban
- JIT
- Visual
- Empowerment
- Simplified



# ERP & Lean – Similarities and Differences

## *ERP*

ERP is a set of business processes and methodologies, enabled by computer technology, designed to integrate all functional areas within an enterprise to optimize the use of resources used to accomplish tasks

Strives to minimize inventory

Order based

Utilizes a computer

It is a PUSH system

## *Lean*

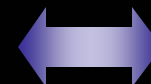
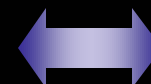
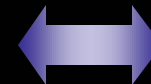
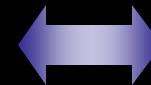
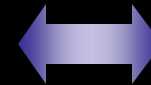
A philosophy of work that focuses on the elimination of all waste and the minimization of the amount of resources used to accomplish tasks

Strives to eliminate waste

Flow (JIT & Kanban)

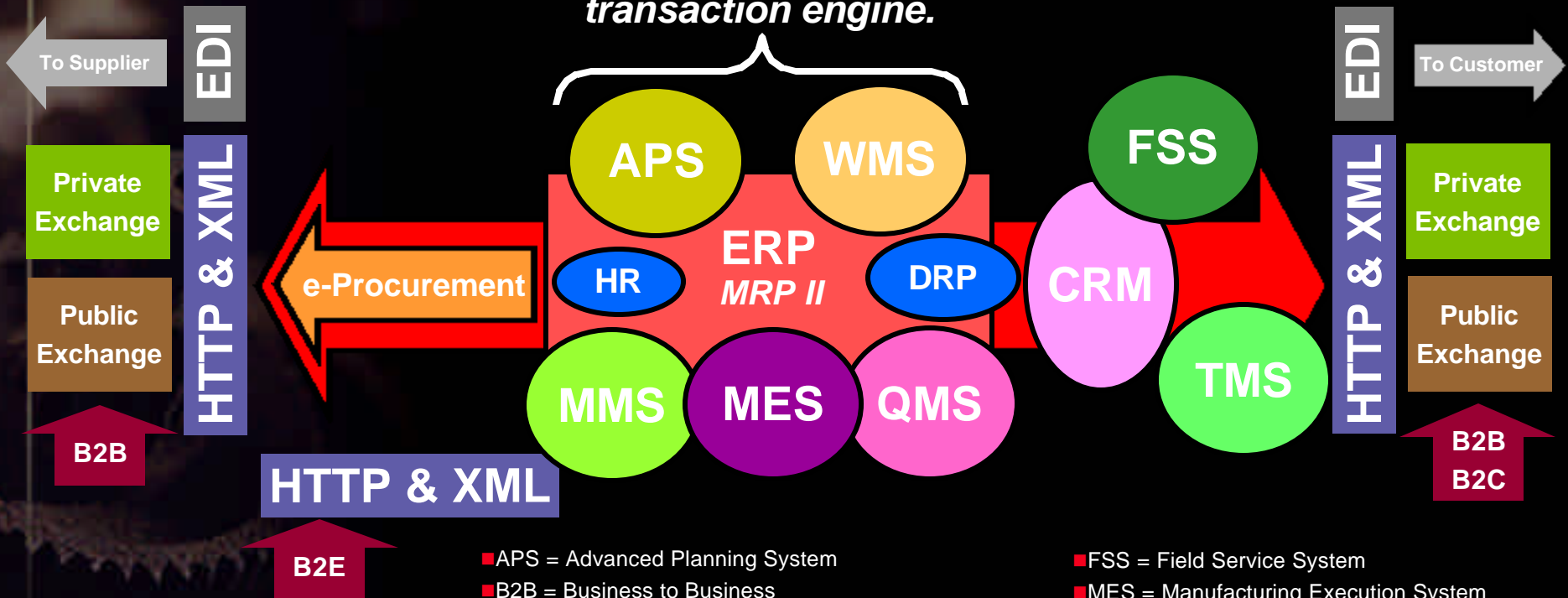
Primarily visual

It is a PULL system



# ERP II – Next Generation of Total Integration

*ERP is the core data base and transaction engine.*



- APS = Advanced Planning System
- B2B = Business to Business
- B2C = Business to Consumer
- B2E = Business to Employee
- CRM = Customer Relationship Management
- DRP = Distribution Requirements Planning
- EDI = Electronic Data Interchange
- ERP = Enterprise Resources Planning
- FSS = Field Service System
- MES = Manufacturing Execution System
- MMS = Maintenance Management System
- MRP II = Manufacturing Resources Planning
- QMS = Quality Management System
- TMS = Transportation Management System
- WMS = Warehouse Management System

# ERP Processes

**ERP**

**LEAN**

## *Planning*

Demand Management  
& Forecasting

Business Planning

Sales and Operations  
Planning

Resource Reqmts  
Planning

## *Scheduling*

Master Production  
Scheduling

Rough Cut Capacity  
Planning

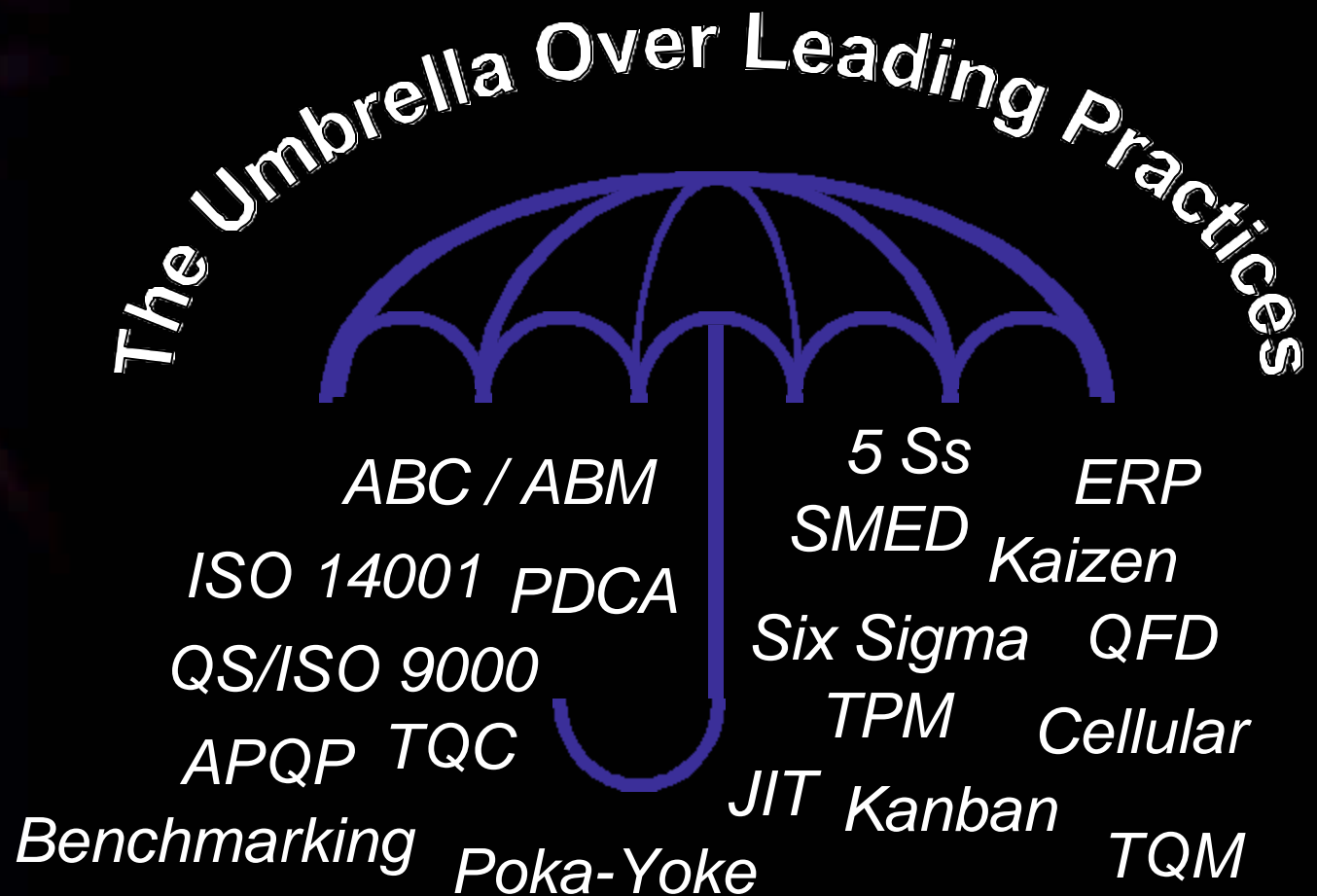
Material Requirements  
Planning

Capacity Requirements  
Planning

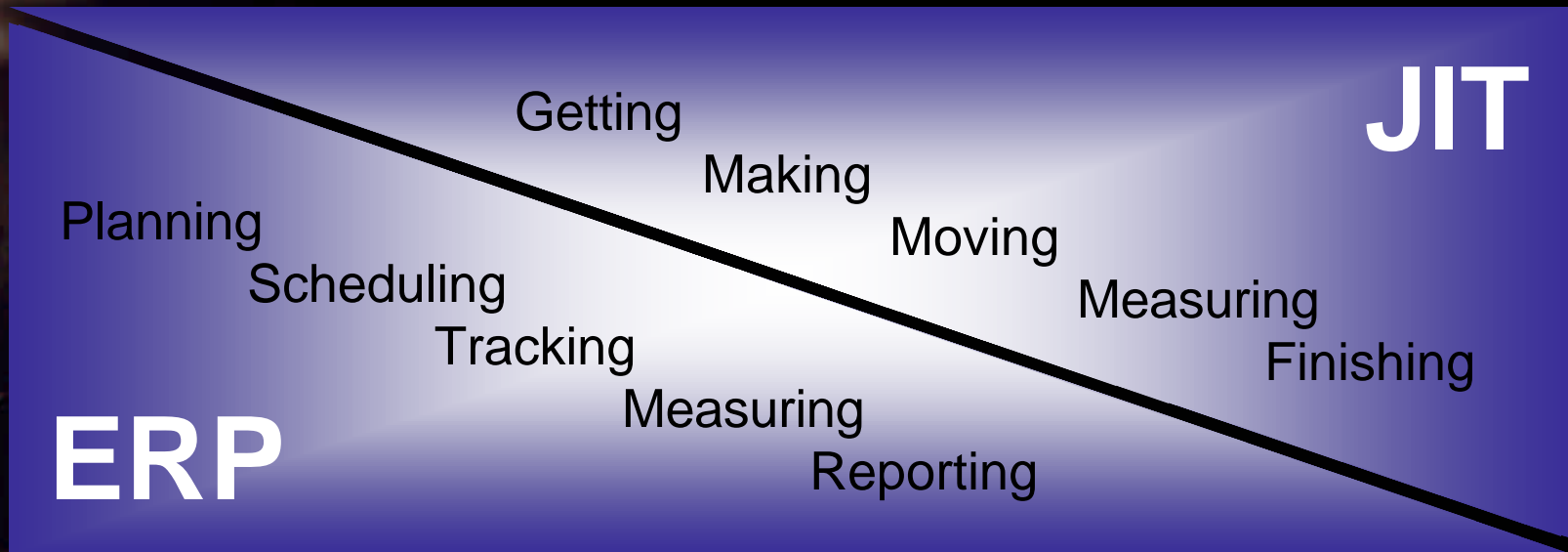
## *Execution*

Execution

# Lean Processes

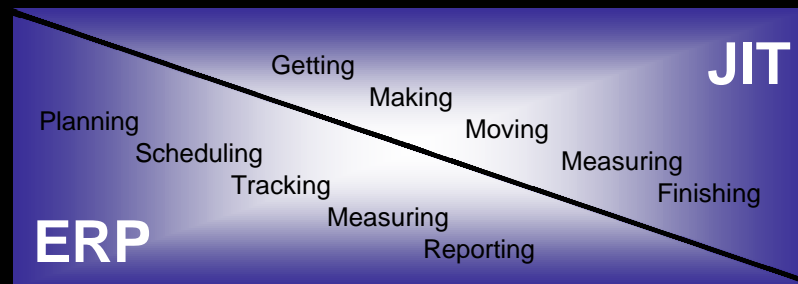


# Digital and Visual Environments



**Planning** → **Execution**

# Computerized and Visual Environments



Planning → Execution

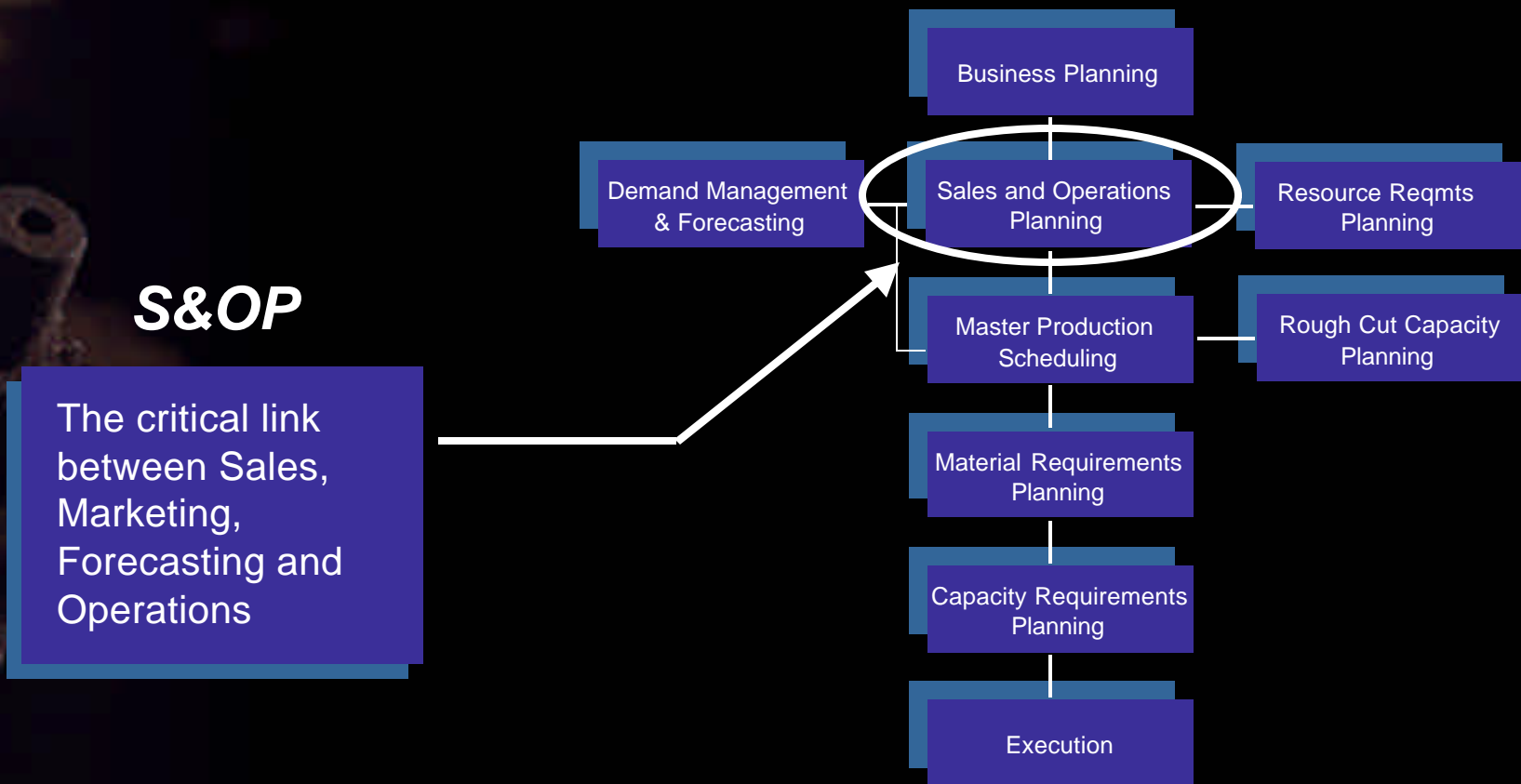


Data and information is in the computer but access may be limited. Accuracy may also be questionable.

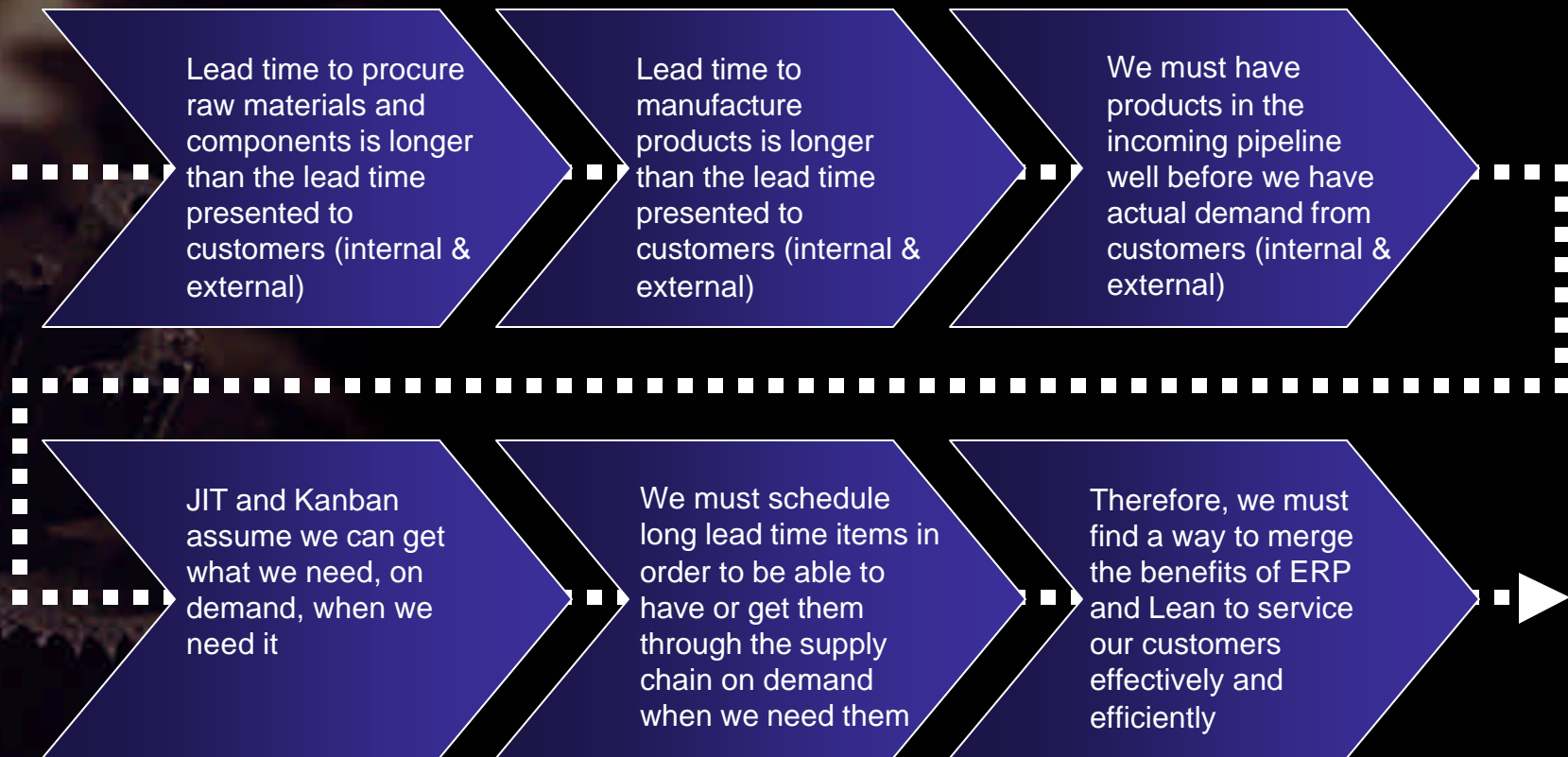


Data and information tends to be visual but availability may be limited. Accuracy is typically not an issue.

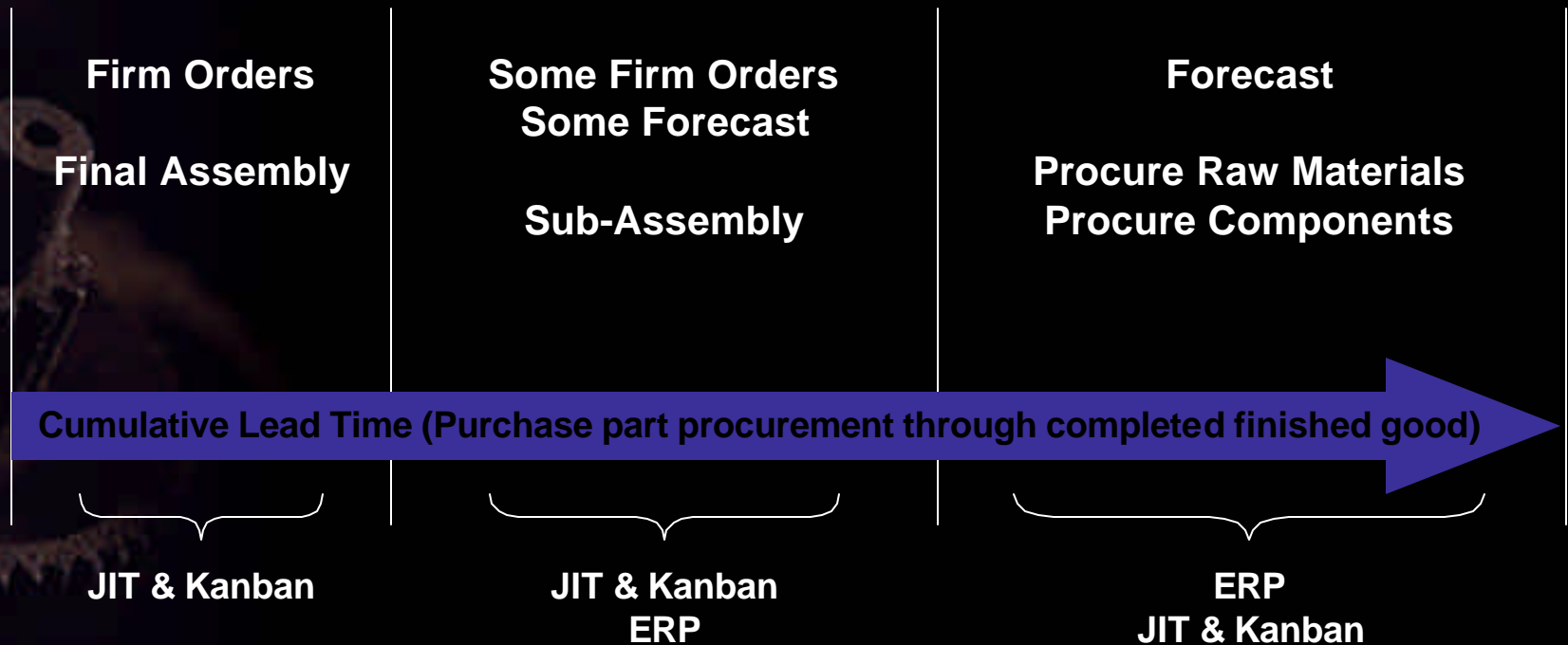
# Linking Sales/Marketing to Operations



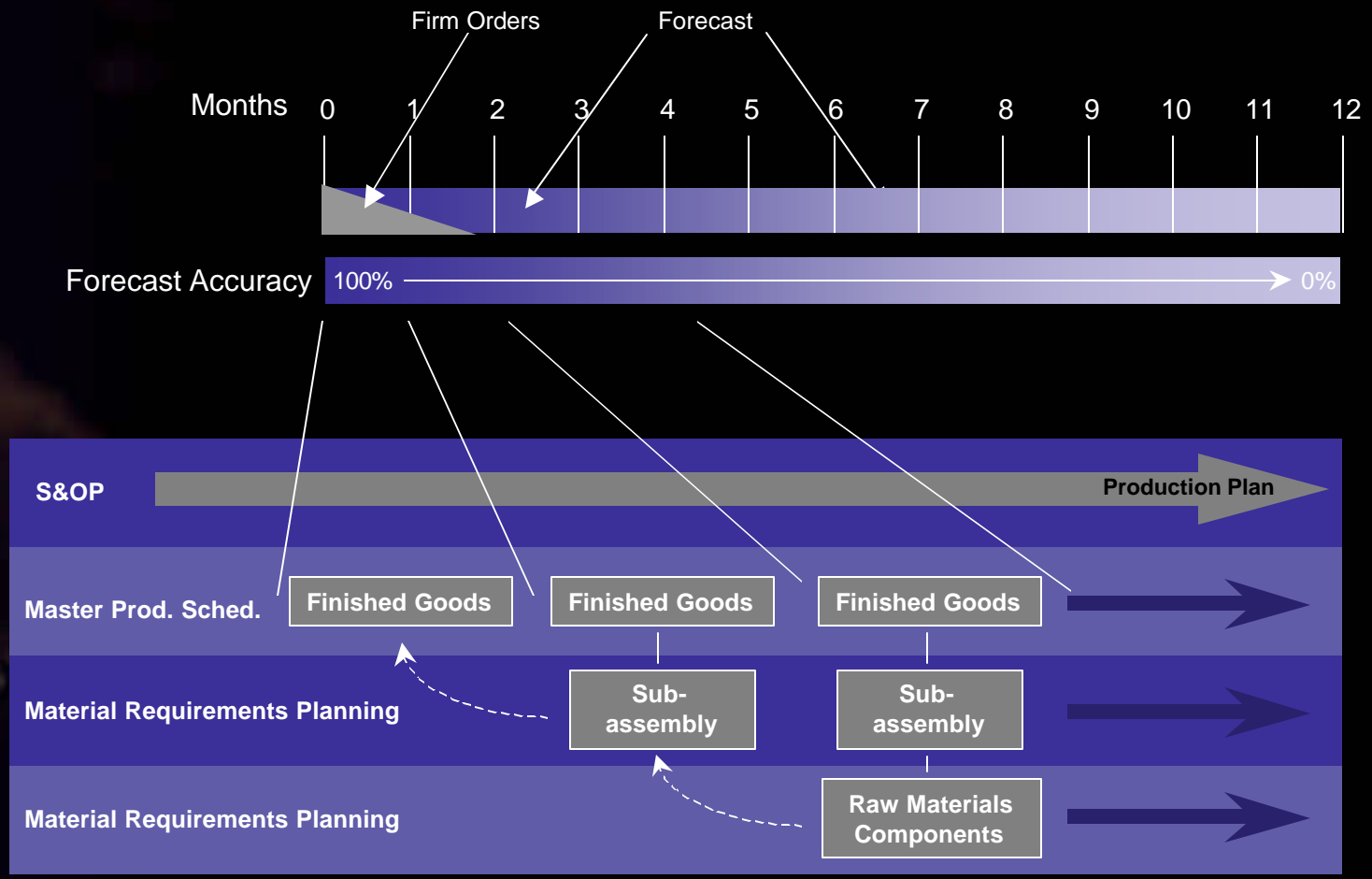
# Planning & Scheduling (ERP) – Why Do It?



# Planning & Scheduling with Lean



# The Dynamics of Planning & Scheduling



# Work Orders Versus Kanban

## SFC

### Work Order

- Part Number
- Quantity
- Start Date
- Due Date

- Order Based
- Batch Orientated
- Requires production reporting
- Good for discrete manufacturing

***Push Push Push***

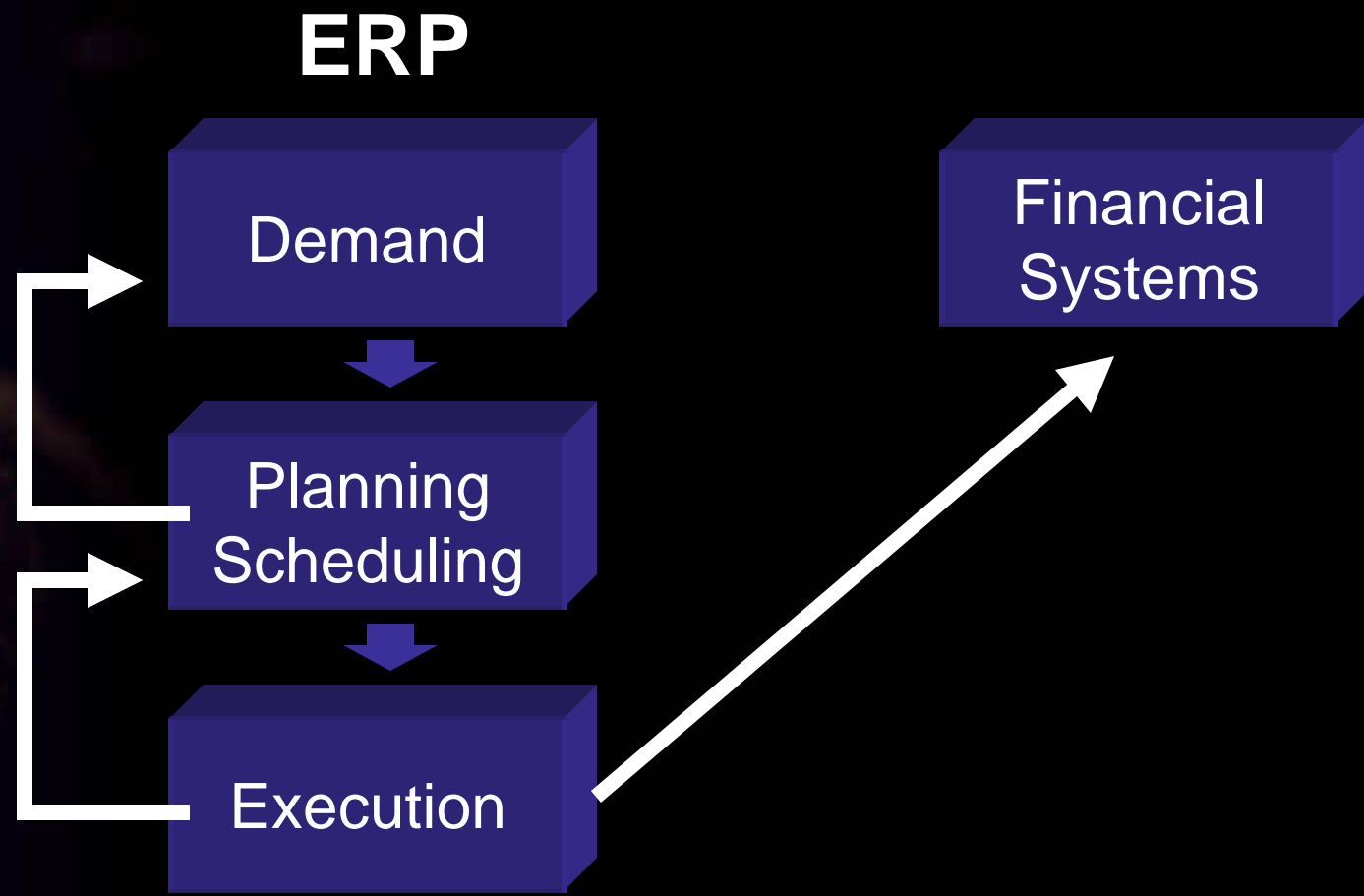
## Kanban

**Production Schedule**

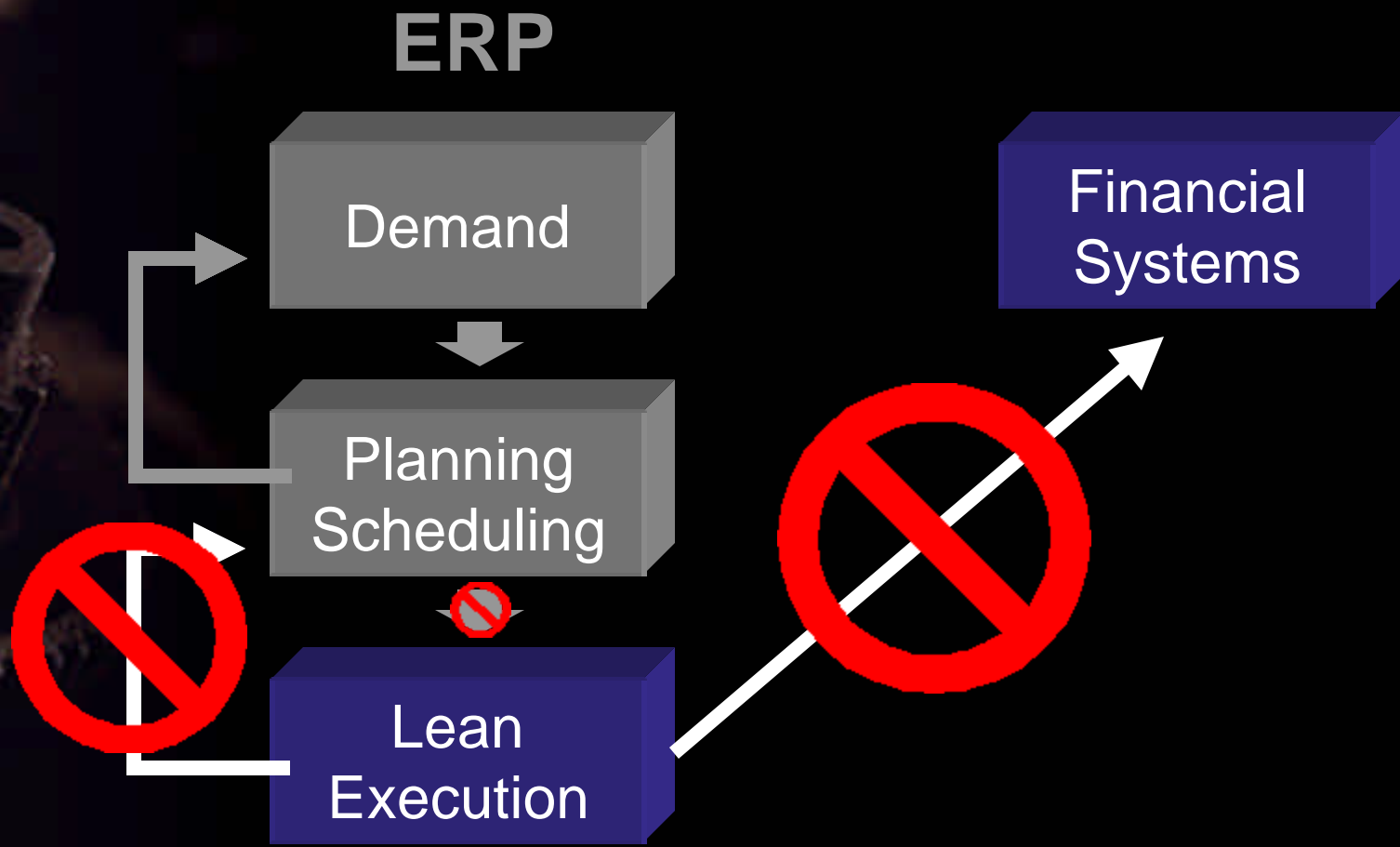
- Rate Based
- Single piece flow
- Production reporting not required
- Good for repetitive or flow manufacturing

***Pull Pull Pull***

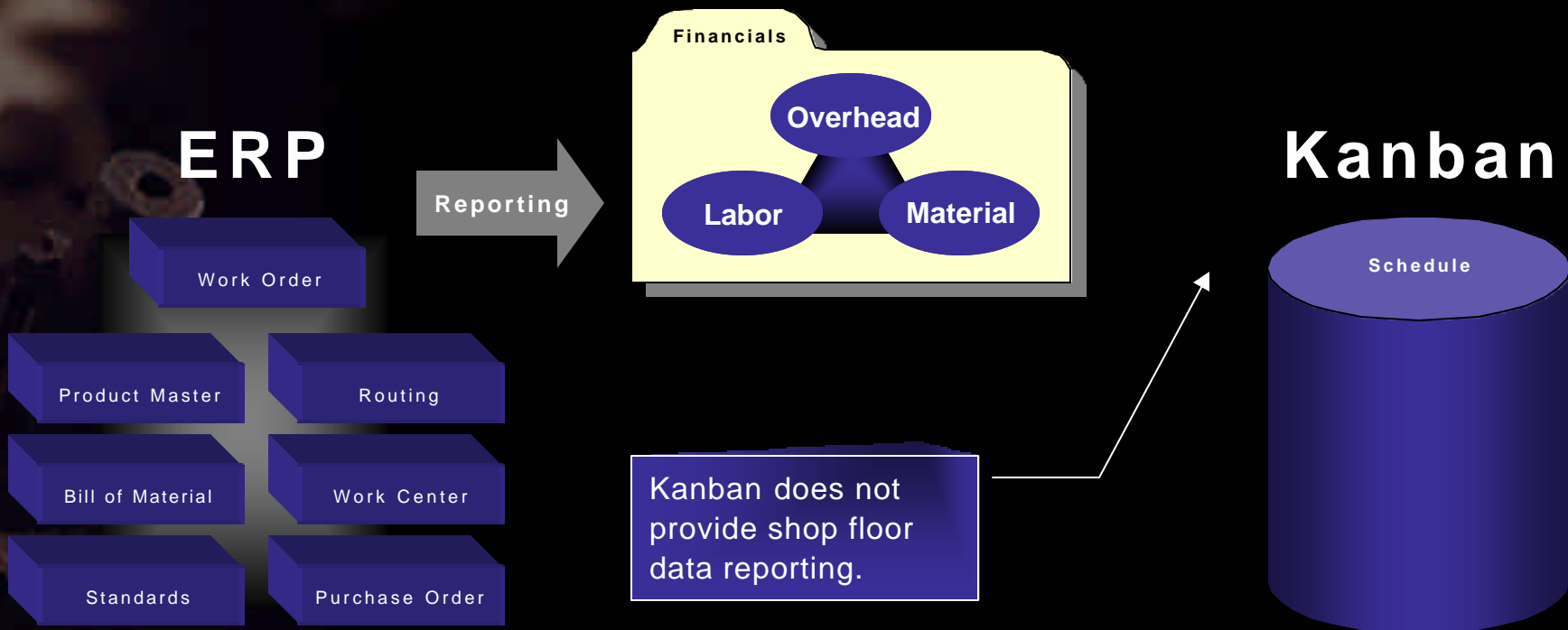
# ERP Performance Feedback



# Lean Performance Feedback



# Tracking & Reporting Mfg. Cost



# Applying Lean Principles (5-Ss) to ERP

The 5 Ss	Lean	ERP
<b>Sort</b>	Eliminate unnecessary tools, parts, instructions, et. By “red-tagging” them and disposing of them after final disposition of need	Use only parts of ERP that benefit the enterprise. Eliminate redundant or unnecessary programs, reports, data-entry, processes, etc.
<b>Simplify</b>	A place for everything and everything in its place	Use ERP to enable straight forward business processes integrated with Lean principles, e.g. backflushing
<b>Shine</b>	Clean everything daily	Ensure all data is always accurate and up to date
<b>Standardize</b>	Documented rules for maintaining the first three Ss	Documented rules for maintaining and using the ERP system
<b>Sustain</b>	Operations safely carried out in the optimum sequence, minimizing waste	Business processes enabled by ERP executed on a timely basis, minimizing waste

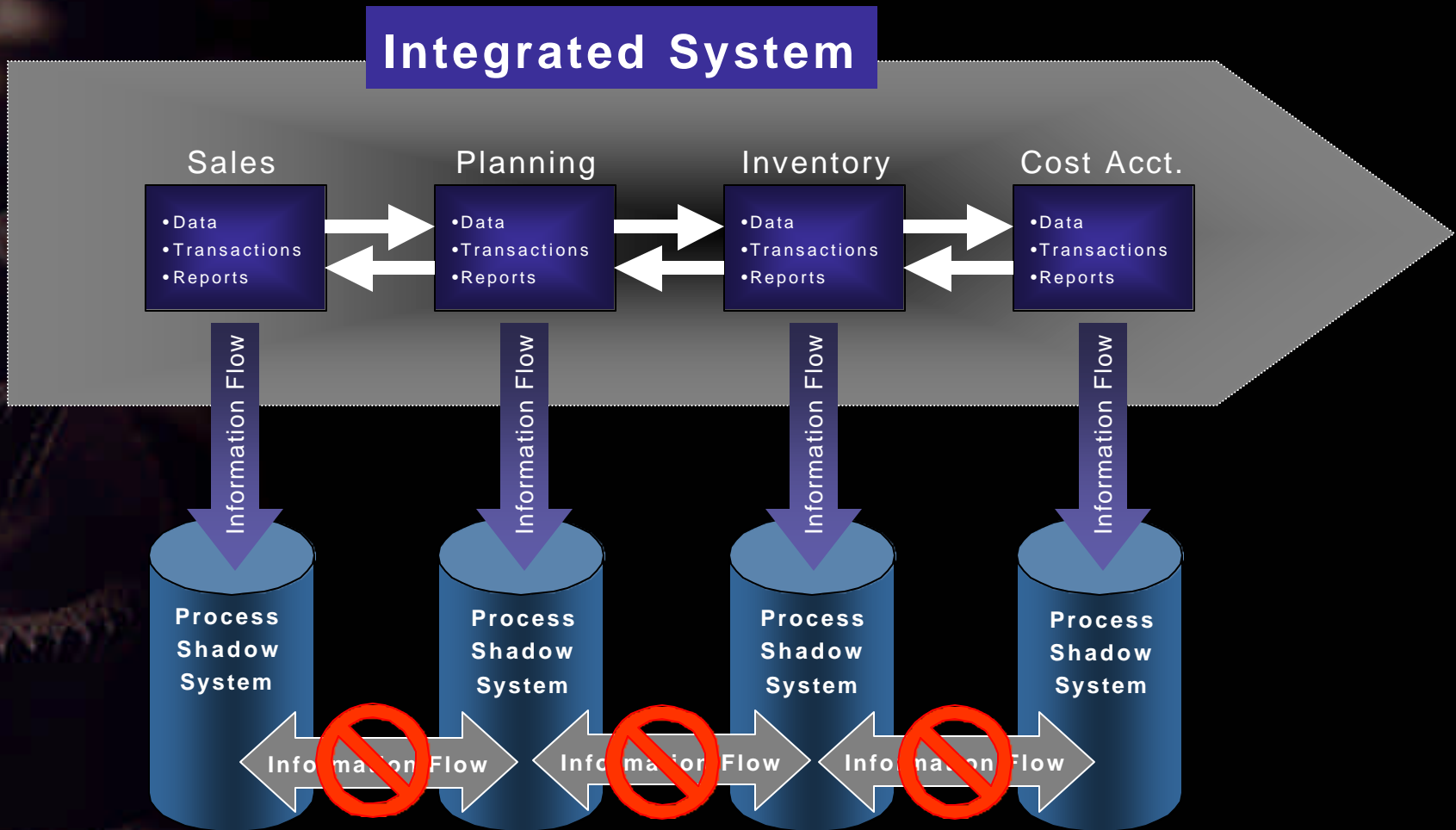
# Applying Lean Principles (8 wastes) to ERP

- Overproduction
  - Schedule only what is needed based on MPS & MRP
- Waiting
  - Reduce the scheduling cycle – plan and schedule daily or by shift
- Stocks & Inventory
  - Eliminate safety stock
  - Become make-to-order
- Transportation
  - Use lean techniques not SFC
- Motion
  - Minimize the scheduling effort
  - Minimize or eliminate labor and production reporting
- Processing
  - Eliminate the use of SFC in lieu of JIT and kanban
- Defects
  - Accurate database
- Information
  - Efficient and effective planning and scheduling

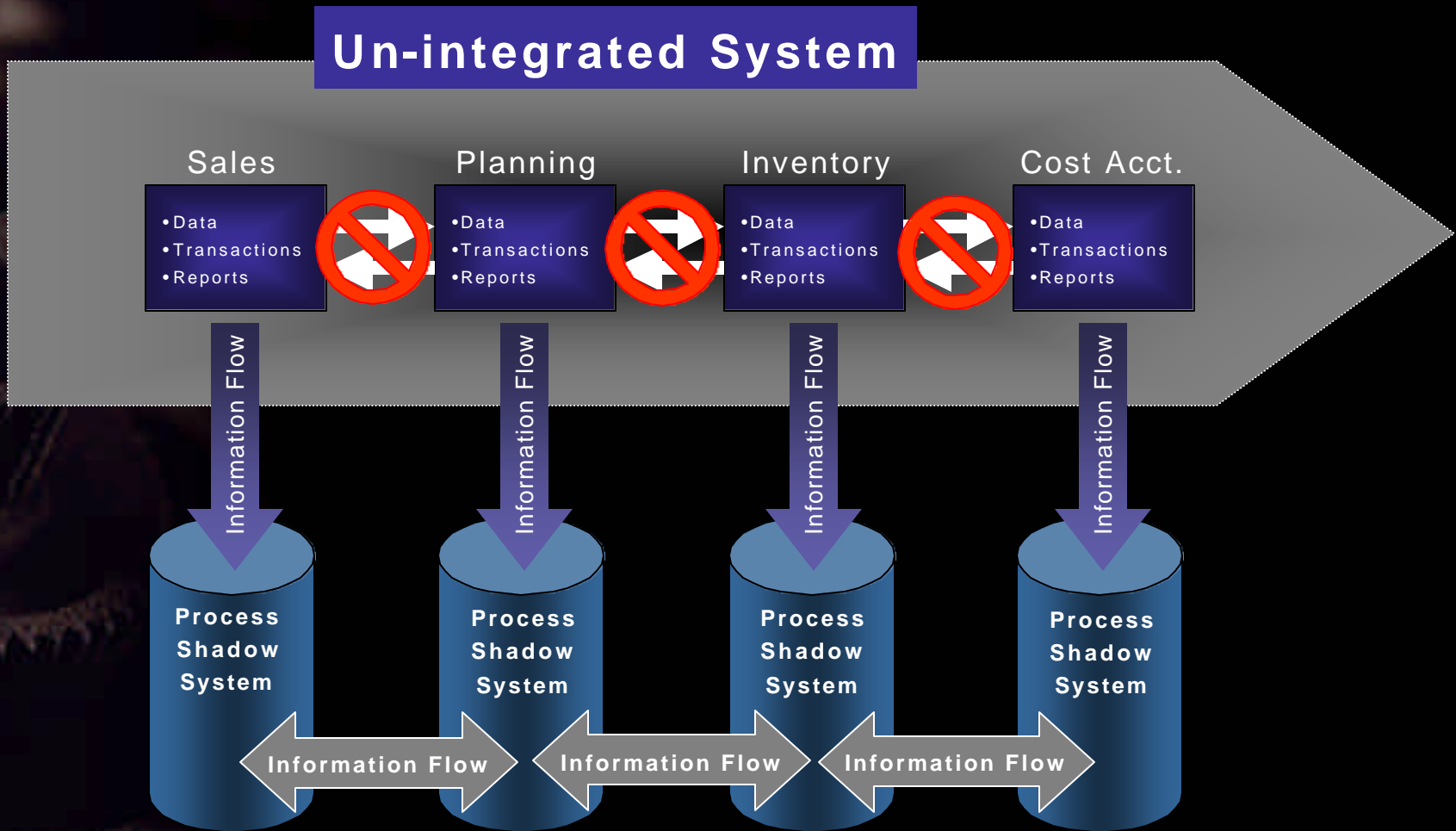
# Applying Lean Principles (JIT) to ERP

Lean & JIT	JIT Applied to ERP
Single piece flow	On-line, real-time data collection
Quality at the source – never pass on a known defect	Transactions and data input are done accurately
Kanban – Pull system – Make parts only when needed	Zero safety stock – order parts only when needed
Visual workplace – information available when needed	Open access to system– I/O devices where needed
Poka-yok (mistake-proofing)	On-line data editing / Automatic Data Collection
Employee empowerment	ERP empowers the users
Zero defects	Accurate data
Team concept & Collaboration	Integration & Collaboration

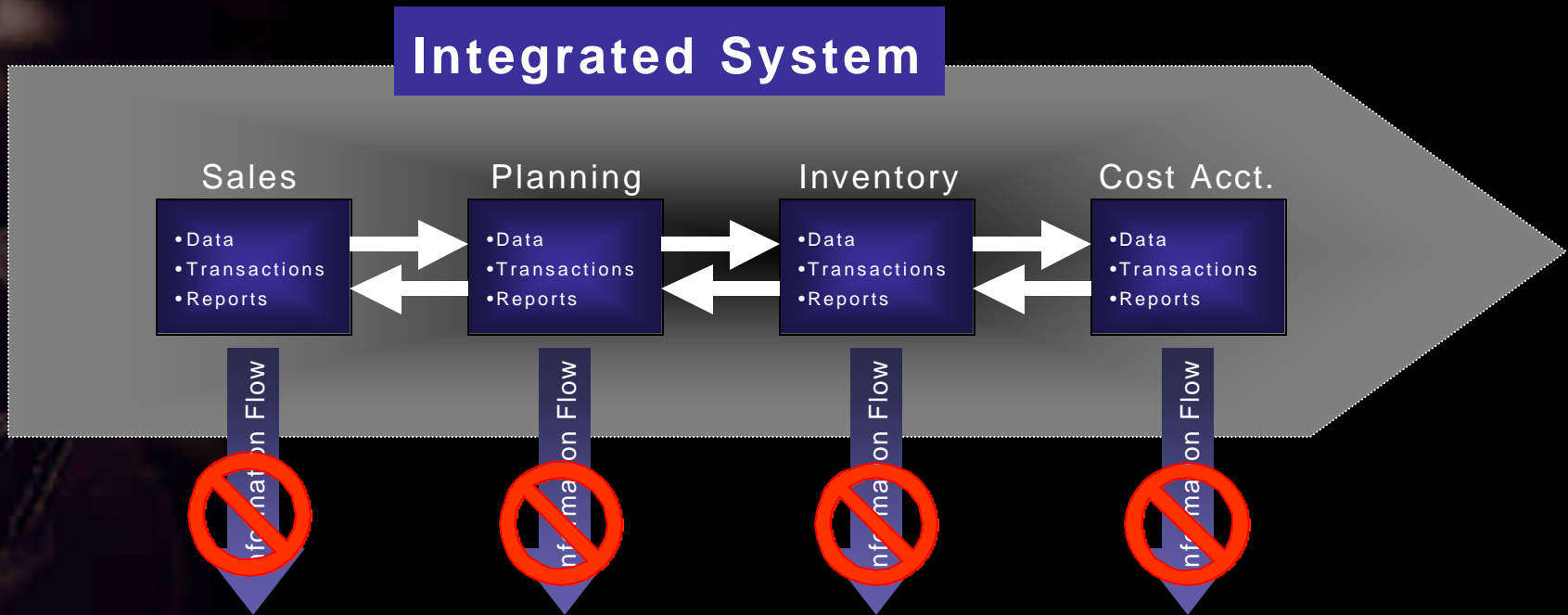
# Integration Without Collaboration



# Collaboration Without Integration



# Collaboration + Integration = Synergy



**There are no shadow systems – everyone is using the same systems and data.**

# Does ERP & Lean Really Work?

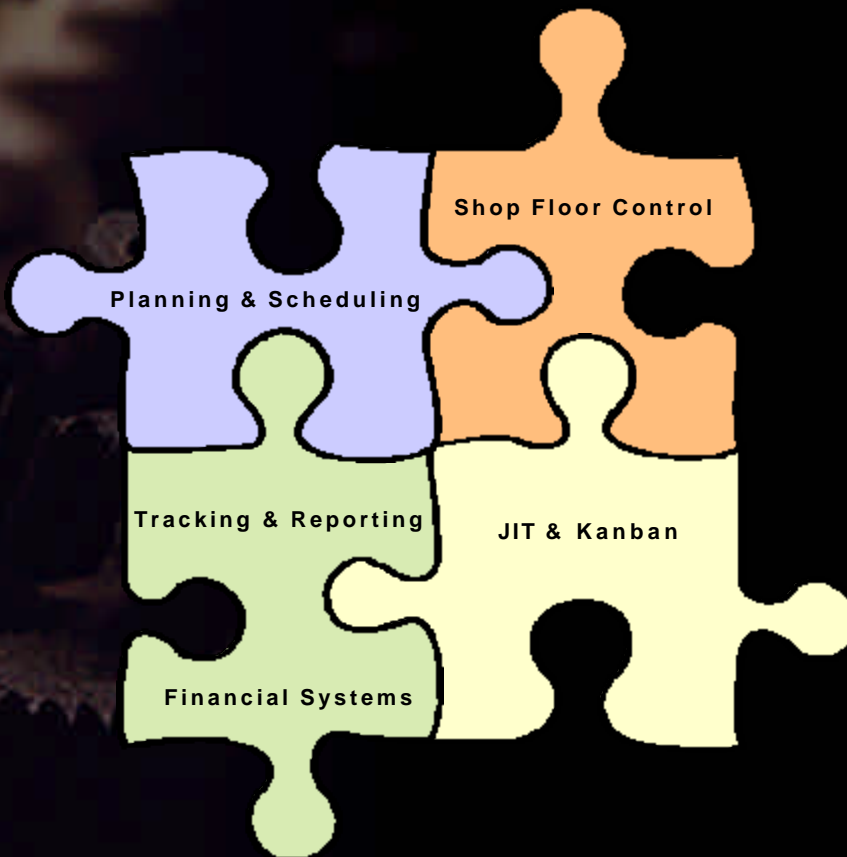
## Doing the right “thing”:

- ERP
- Lean
- JIT
- SMED
- Kanban
- TQM
- TQA
- TOC
- ABC
- TLA

## Doing “things” right:

- Accurate
- Timely
- Consistently
- Change only when needed  
and always when needed

# Putting Together the ERP/Lean Puzzle



## Kaizen for ERP

- Use Kaizen events to:
  - Determine when, where, and how to use ERP
  - Set-up and clean up the data base
- Use value stream mapping to design the optimum application of ERP methods
- Use ERP data editing to Poka-yok processes
- Use ERP integration to enable collaboration and empower everyone

# Thank You!

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