

ERP Meets Lean Management

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High-Tech meets No-Tech!

ERP

Digital

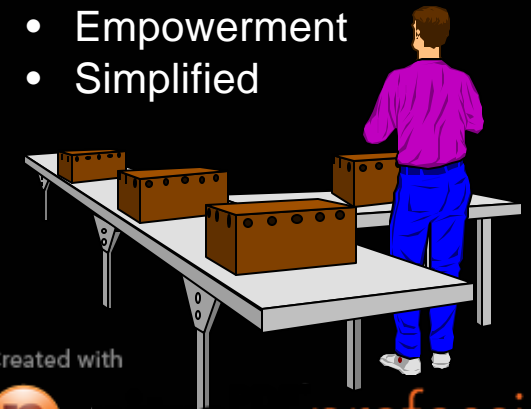
- Work Orders
- Push
- Data Entry
- Reports
- Security/Access
- Data Accuracy
- Complicated

**Spread
Sheets**

Lean

Visual

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



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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

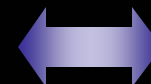
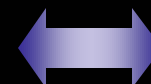
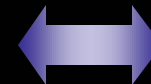
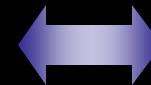
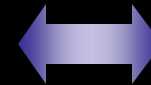
A philosophy of work that focuses on the elimination of all waste and the minimization of the amount of resources used to accomplish tasks

Strives to eliminate waste

Flow (JIT & Kanban)

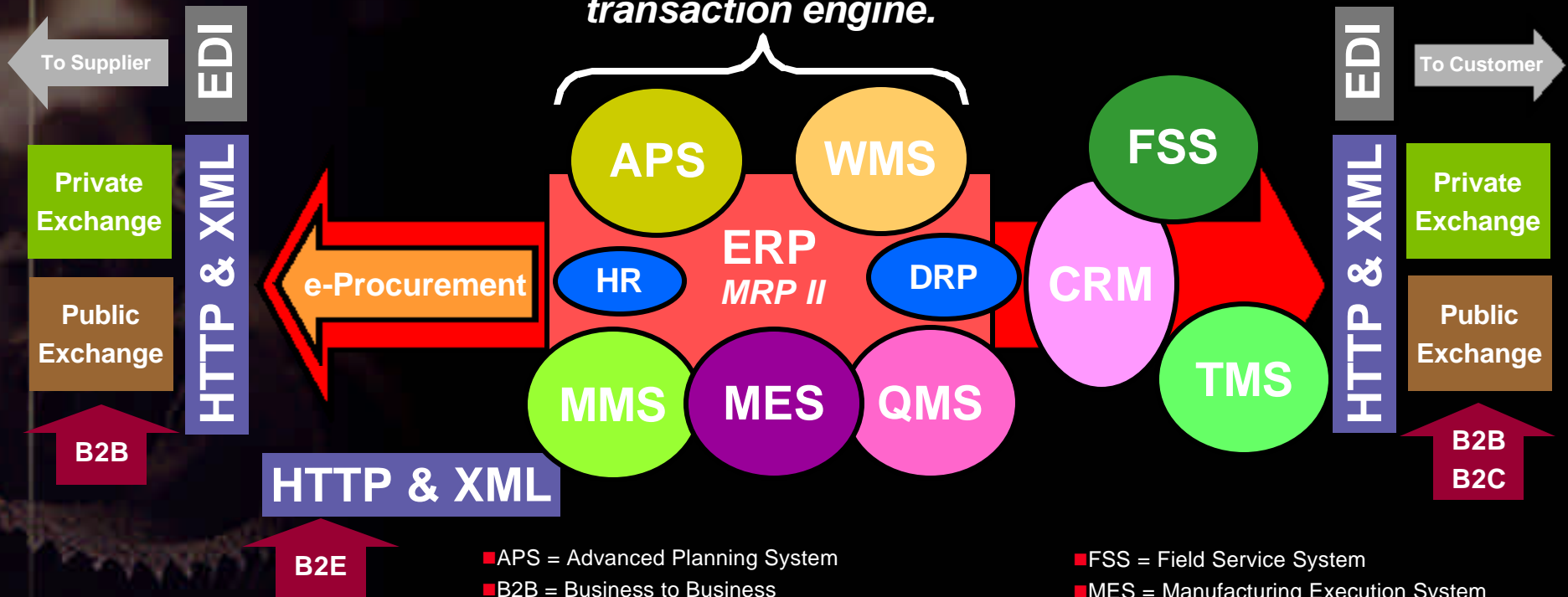
Primarily visual

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

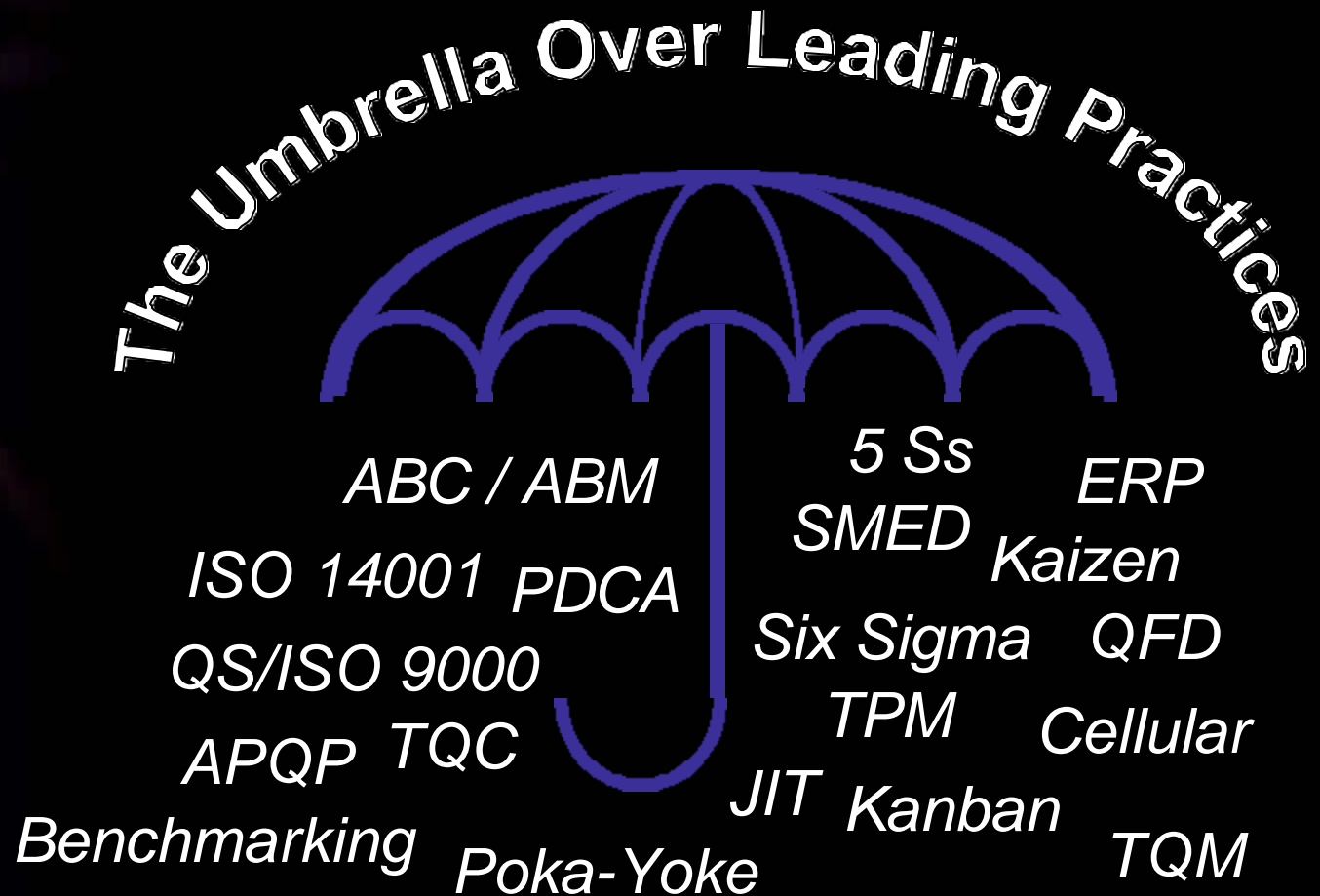
Material Requirements
Planning

Capacity Requirements
Planning

Execution

Execution

Lean Processes



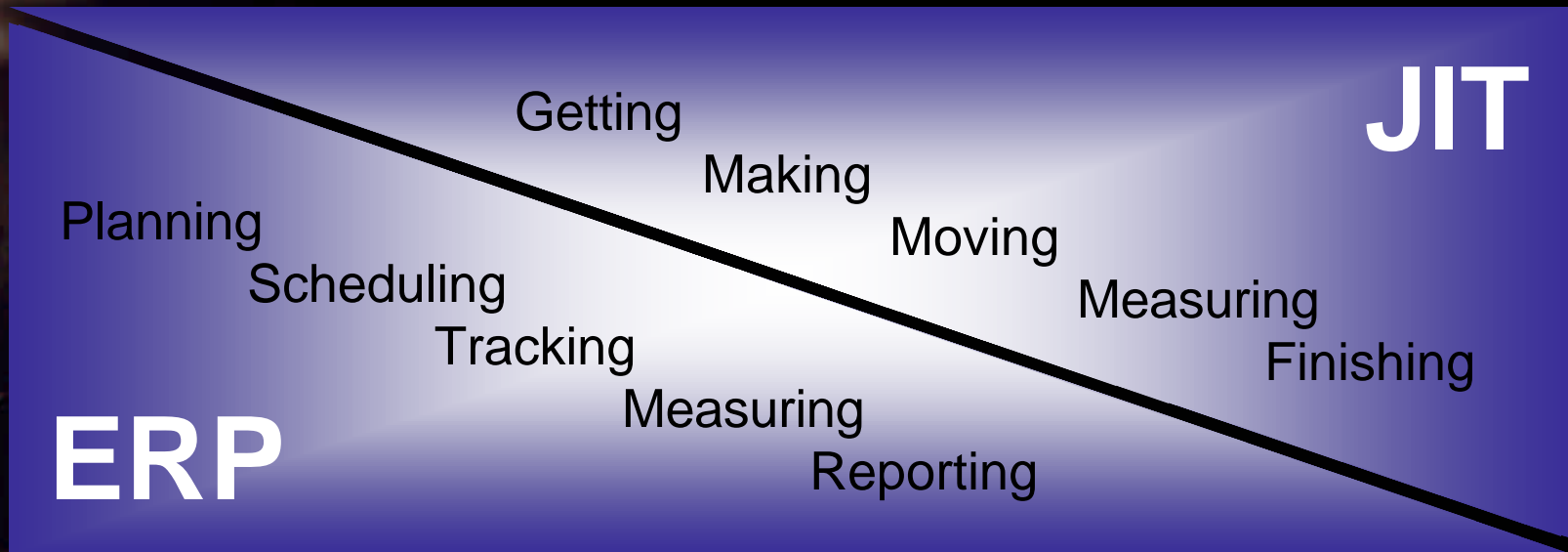
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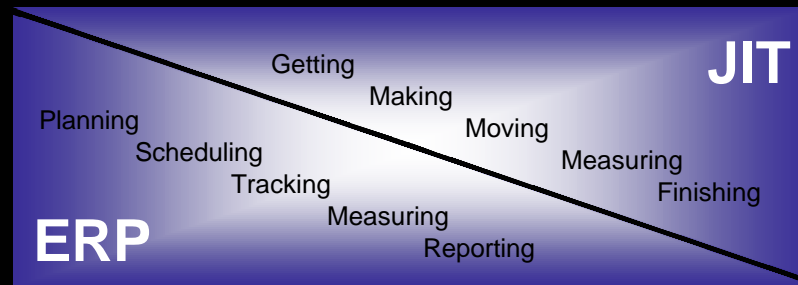
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Digital and Visual Environments



Planning → **Execution**

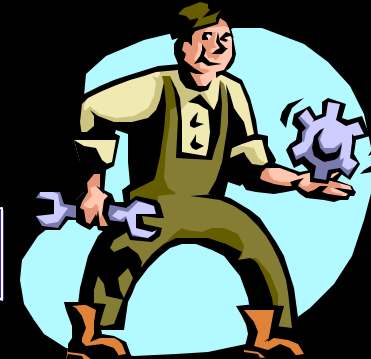
Computerized and Visual Environments



Planning → Execution

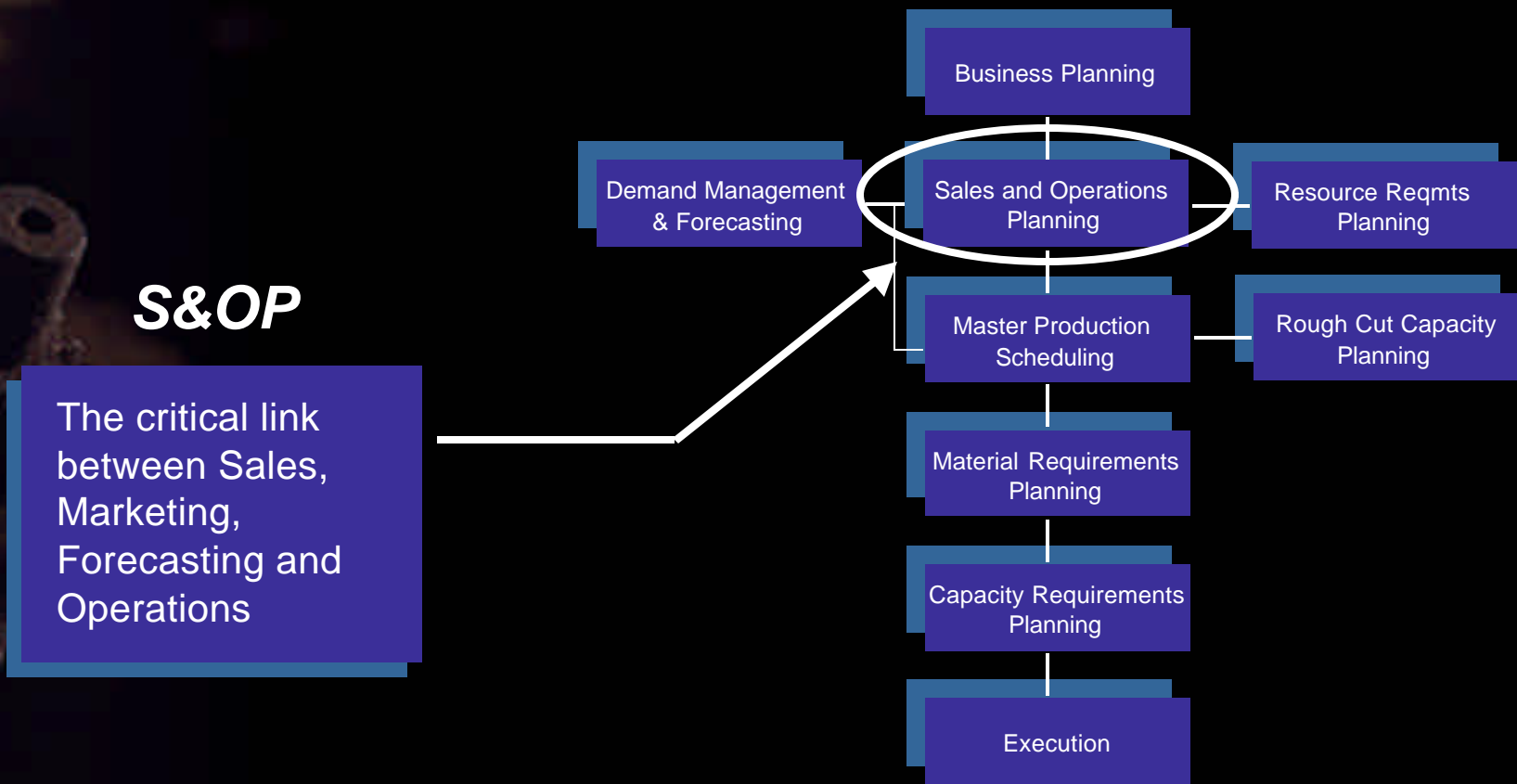


Data and information is in the computer but access may be limited. Accuracy may also be questionable.

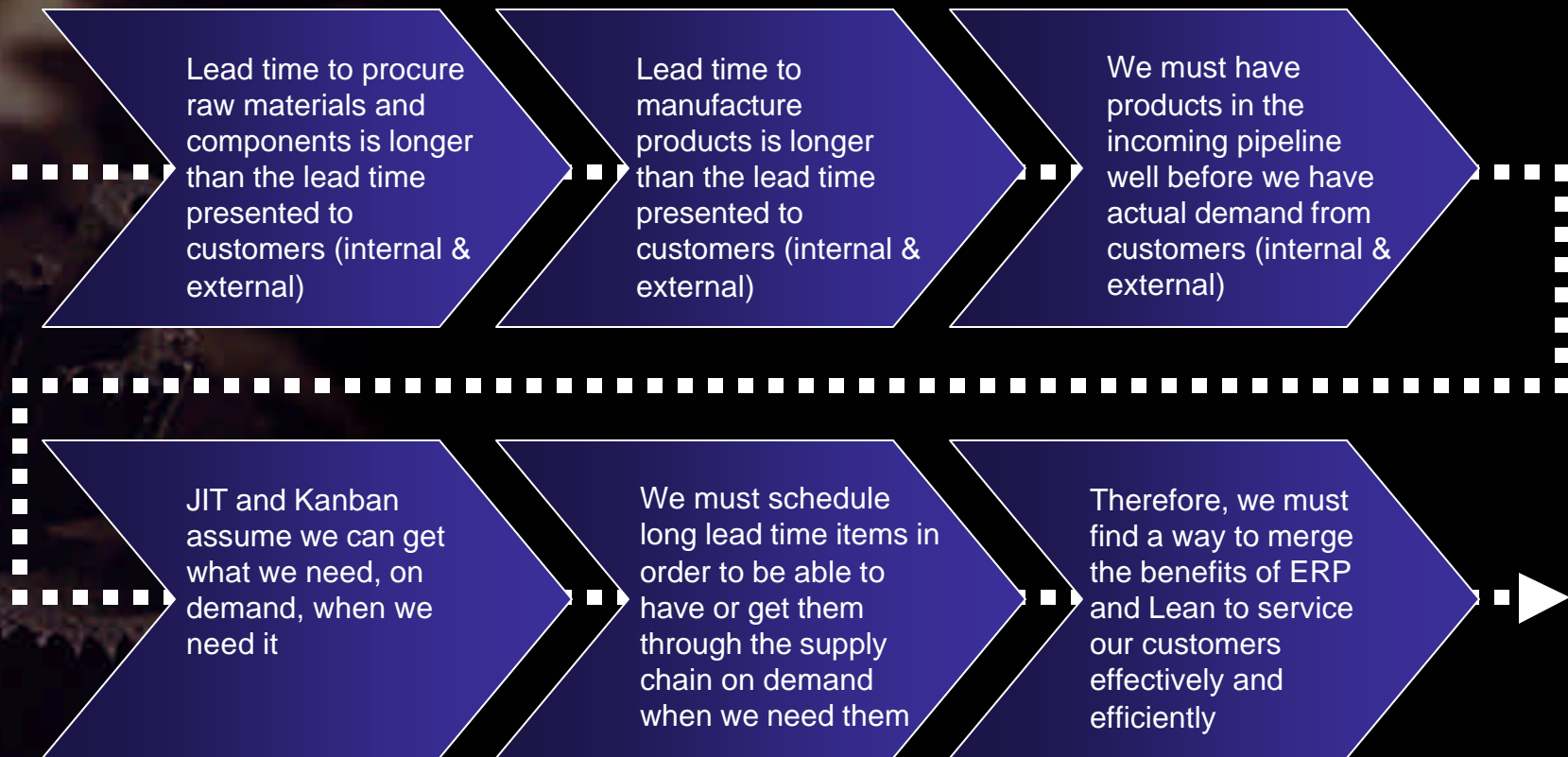


Data and information tends to be visual but availability may be limited. Accuracy is typically not an issue.

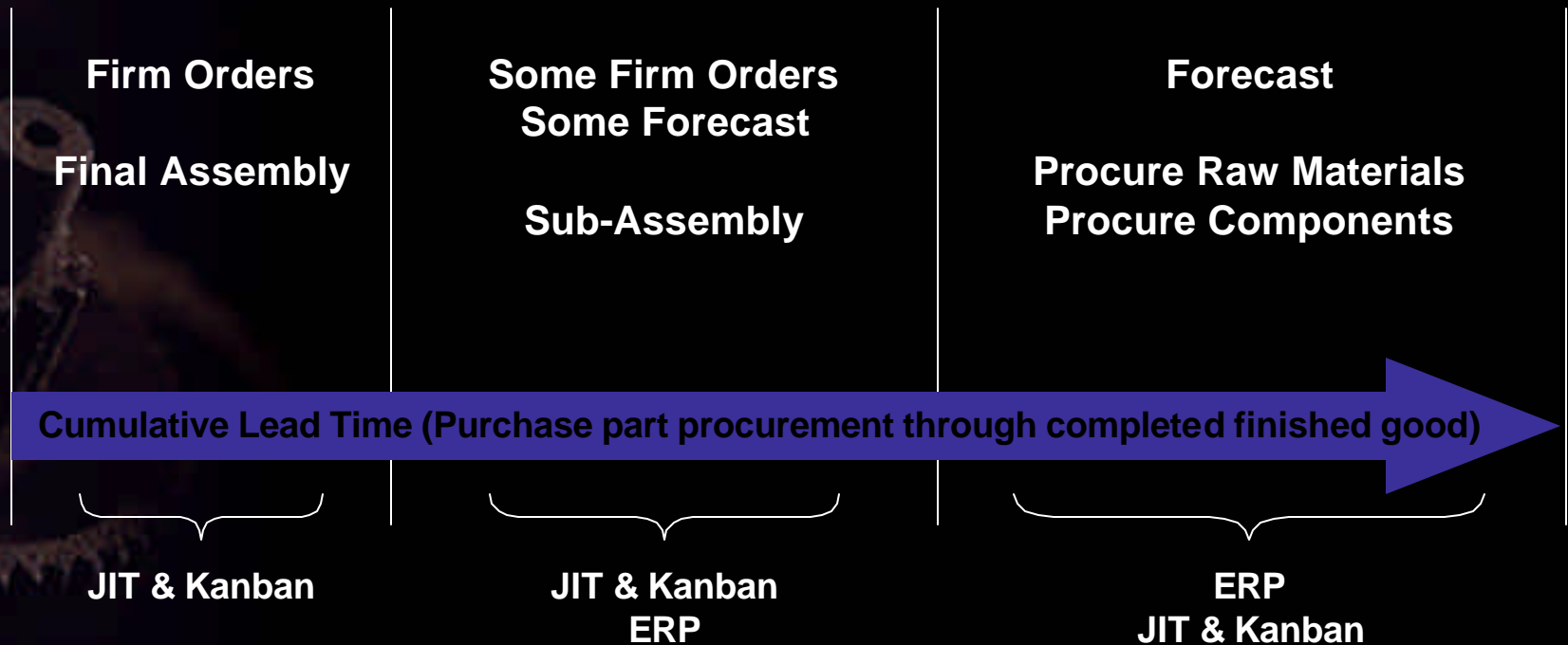
Linking Sales/Marketing to Operations



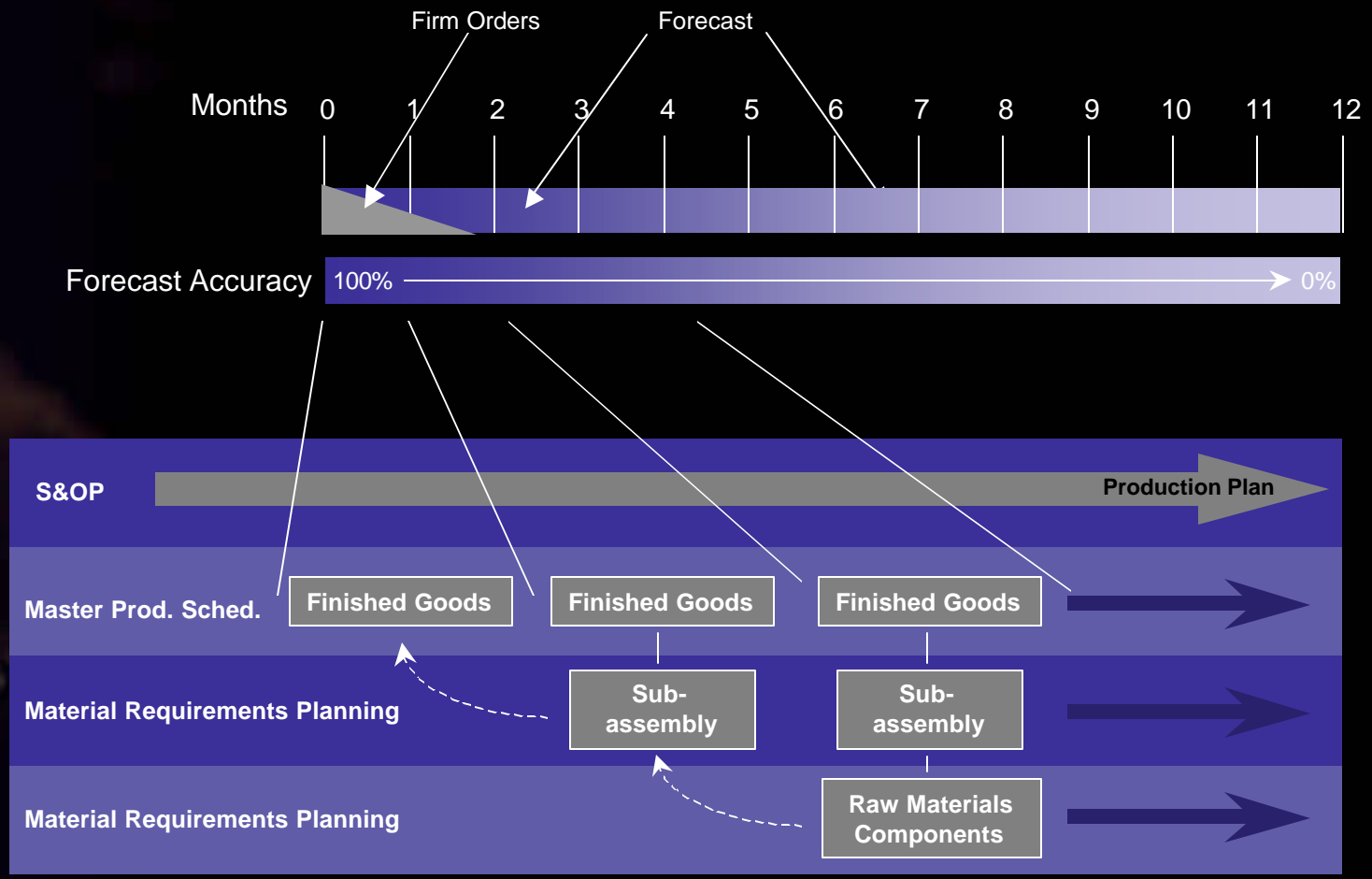
Planning & Scheduling (ERP) – Why Do It?



Planning & Scheduling with Lean



The Dynamics of Planning & Scheduling



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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

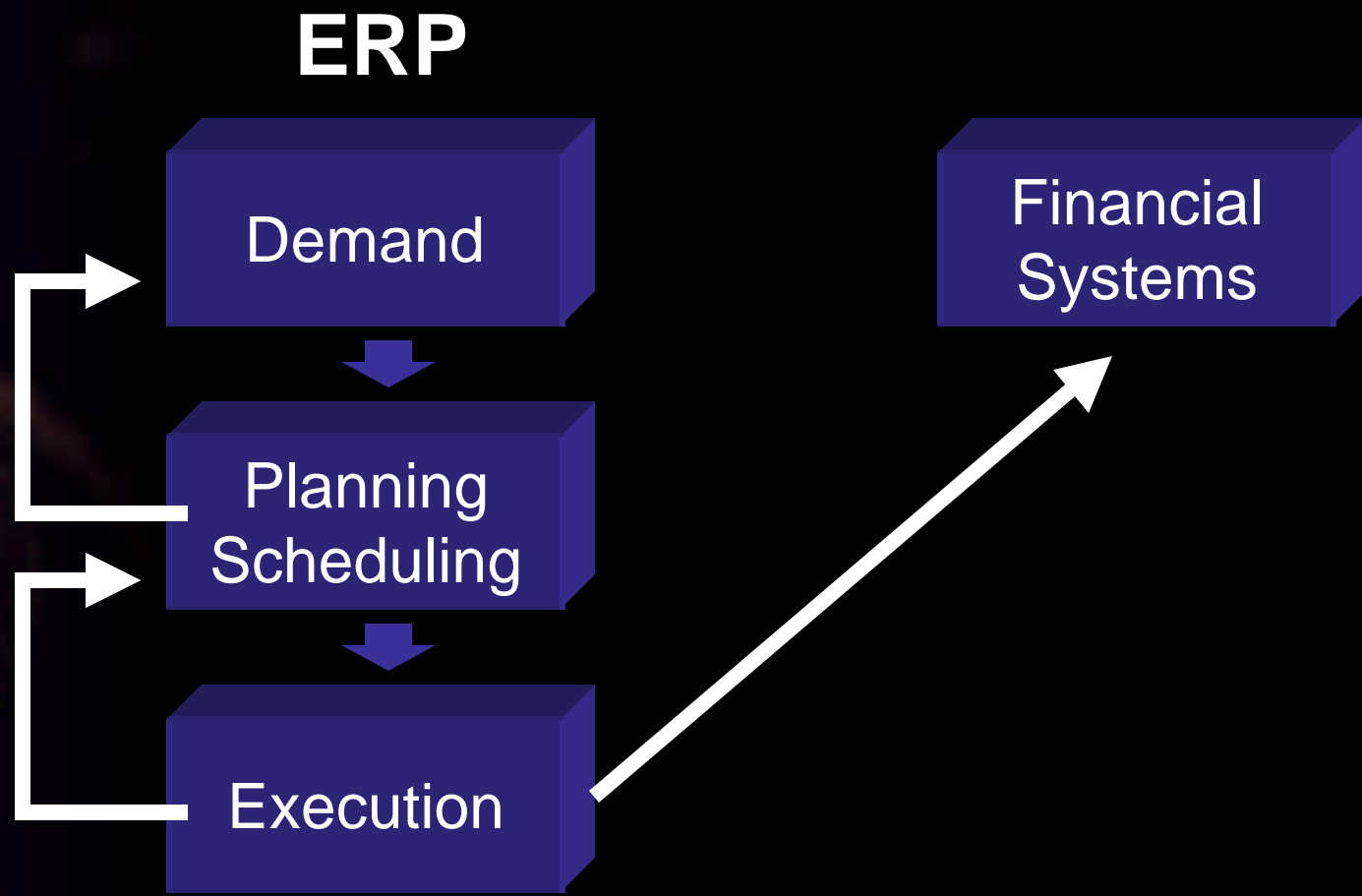
Kanban

Production Schedule 

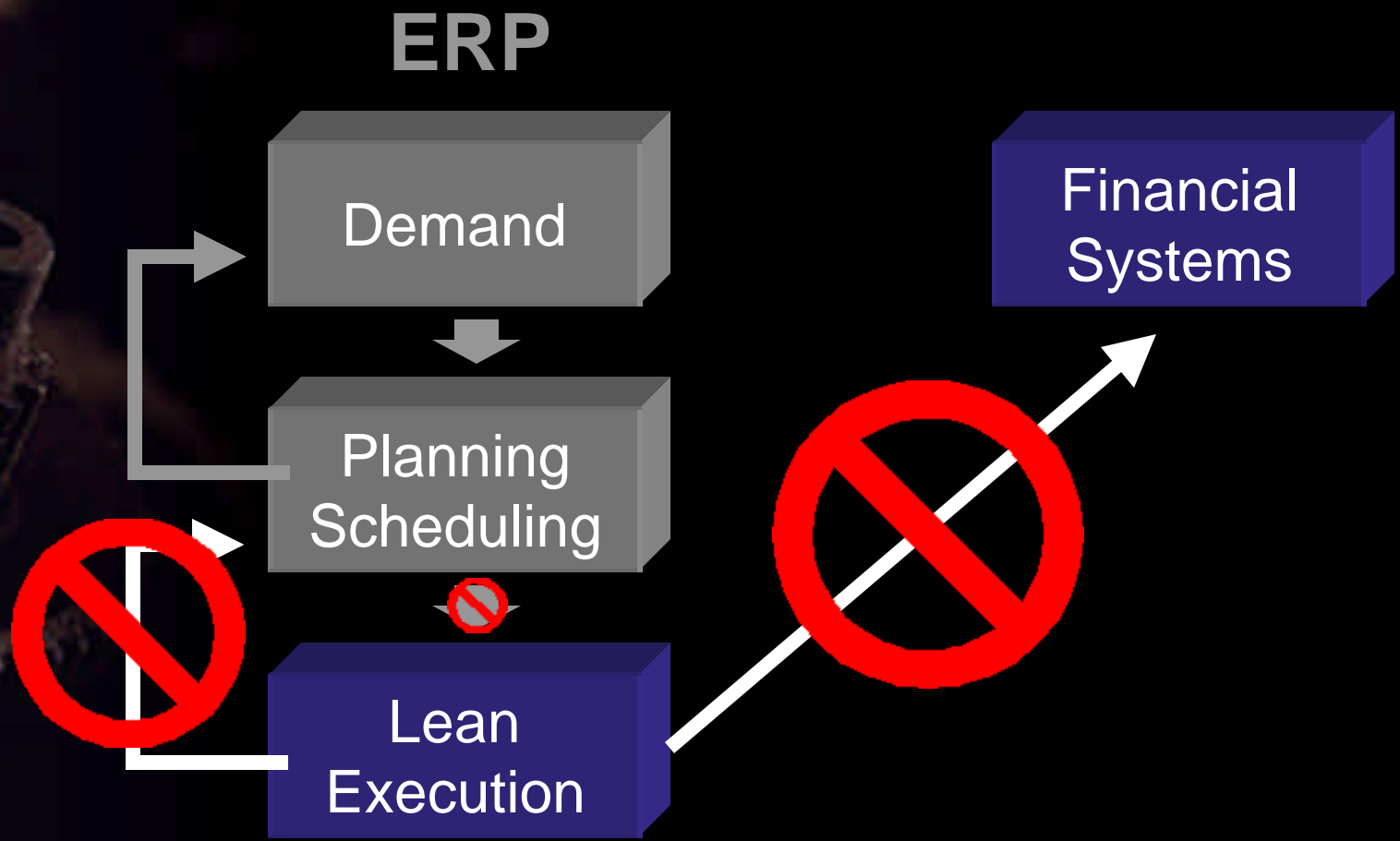
- Rate Based
- Single piece flow
- Production reporting not required
- Good for repetitive or flow manufacturing

Pull Pull Pull

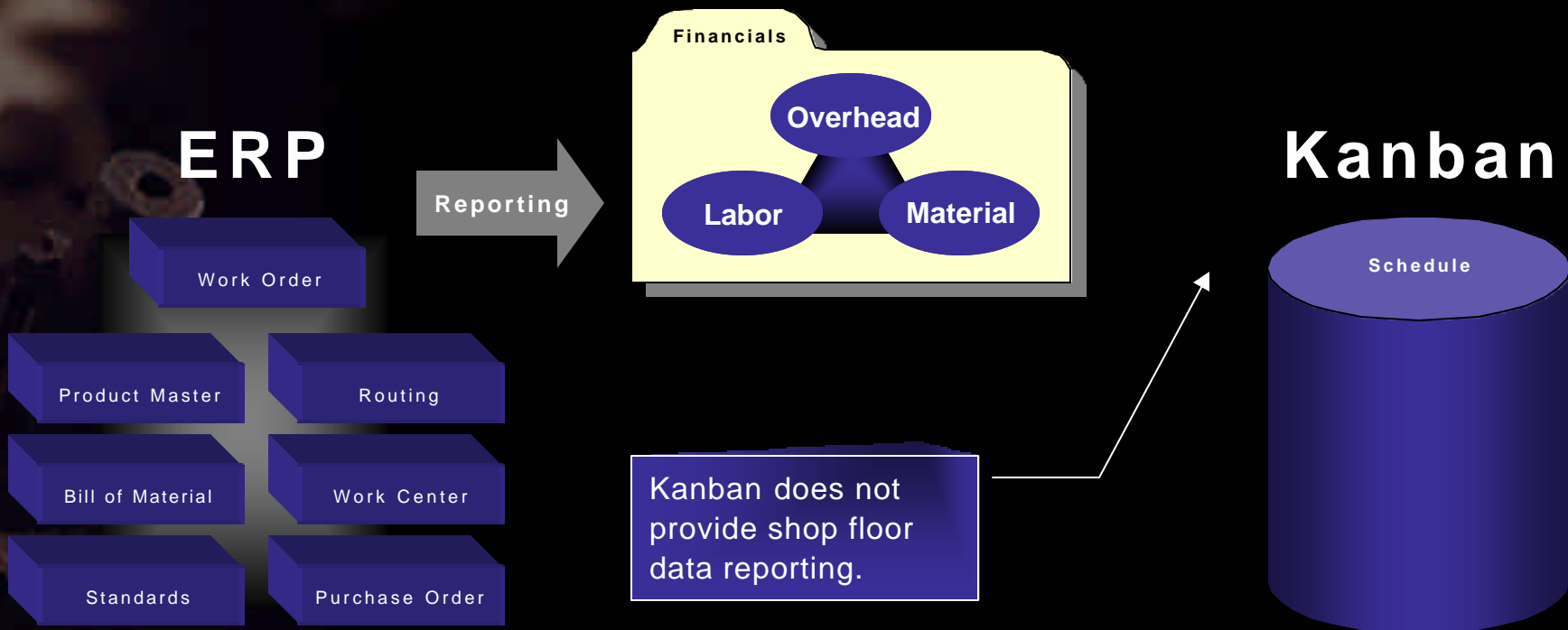
ERP Performance Feedback



Lean Performance Feedback



Tracking & Reporting Mfg. Cost



Applying Lean Principles (5-Ss) to ERP

The 5 Ss	Lean	ERP
Sort	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.
Simplify	A place for everything and everything in its place	Use ERP to enable straight forward business processes integrated with Lean principles, e.g. backflushing
Shine	Clean everything daily	Ensure all data is always accurate and up to date
Standardize	Documented rules for maintaining the first three Ss	Documented rules for maintaining and using the ERP system
Sustain	Operations safely carried out in the optimum sequence, minimizing waste	Business processes enabled by ERP executed on a timely basis, minimizing waste

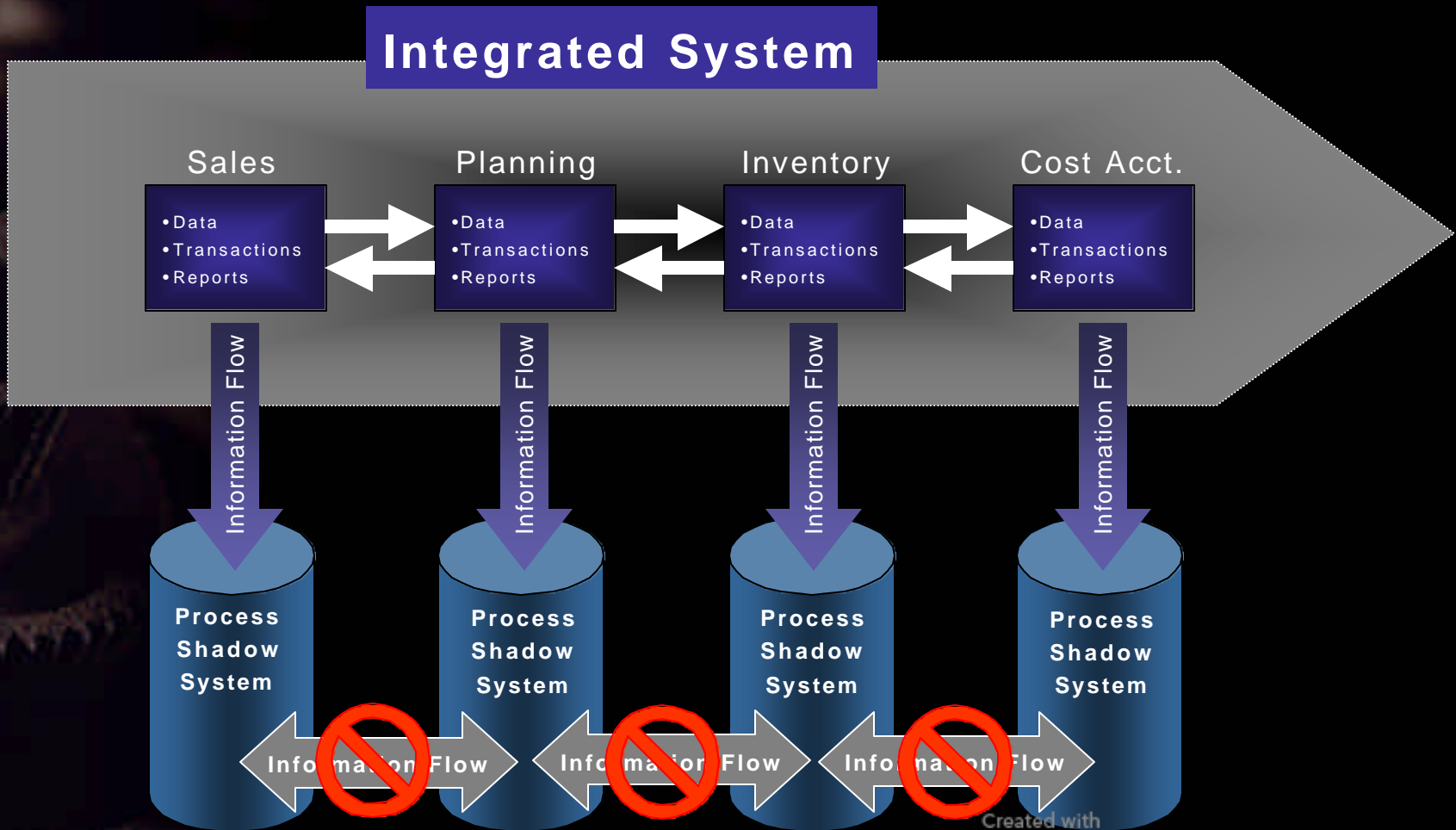
Applying Lean Principles (8 wastes) to ERP

- 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

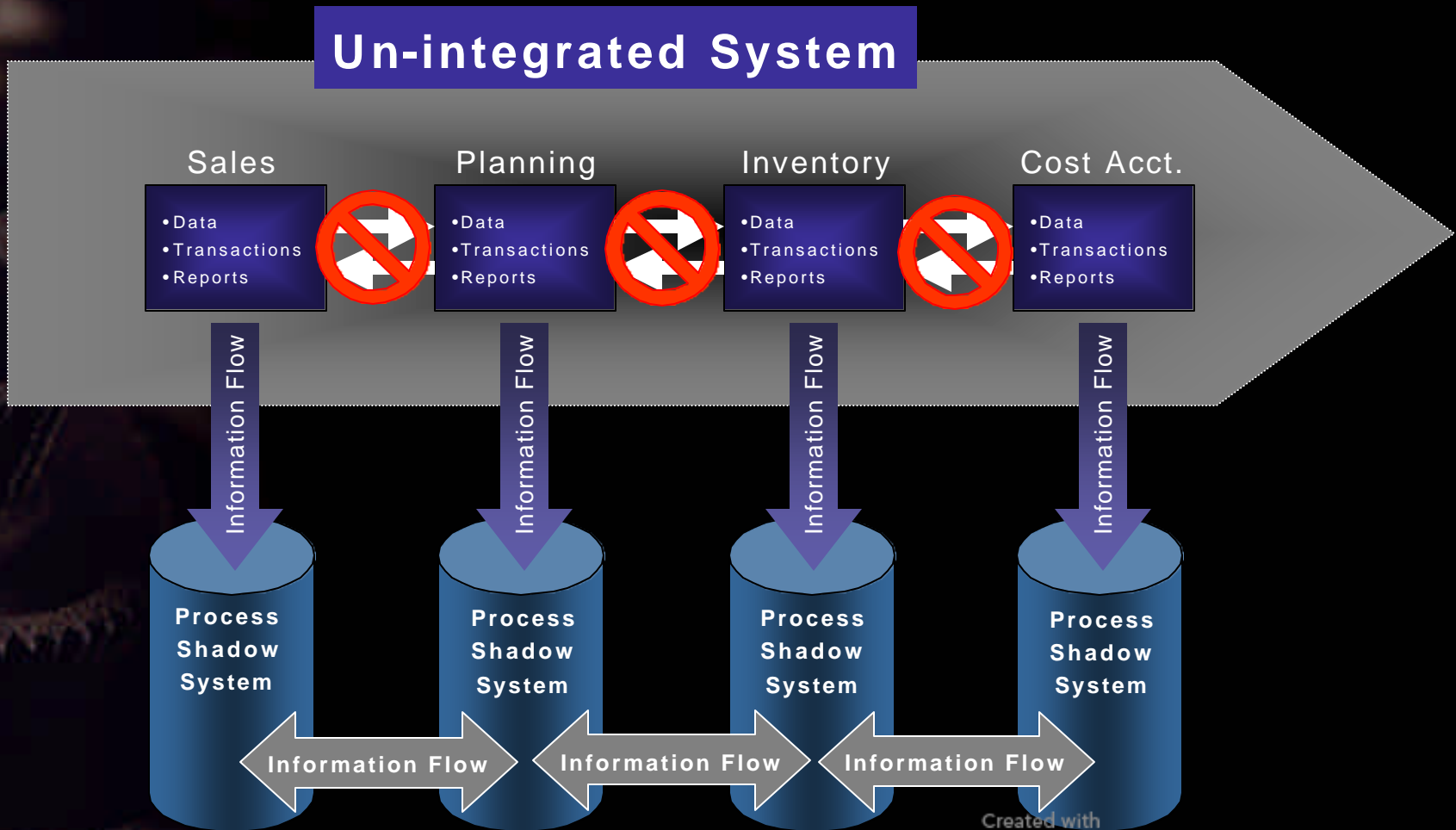
Integration Without Collaboration



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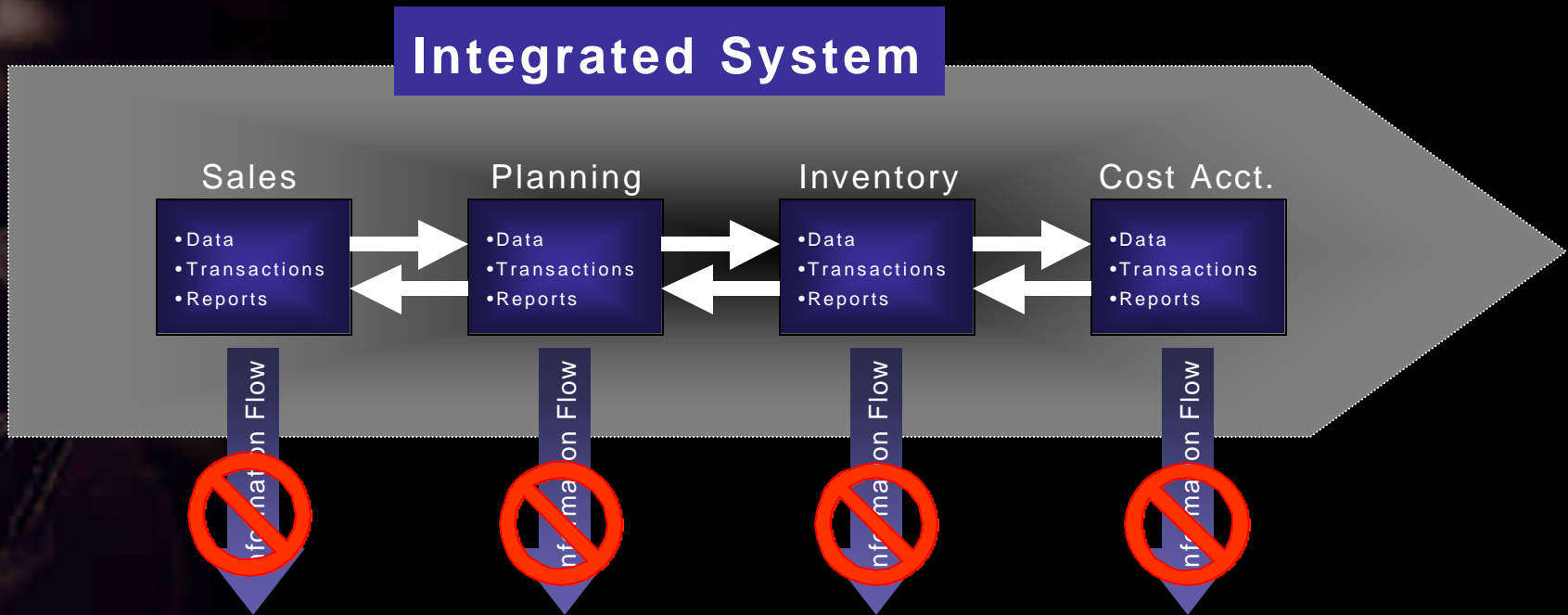
Collaboration Without Integration



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Collaboration + Integration = Synergy



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

Does ERP & Lean Really Work?

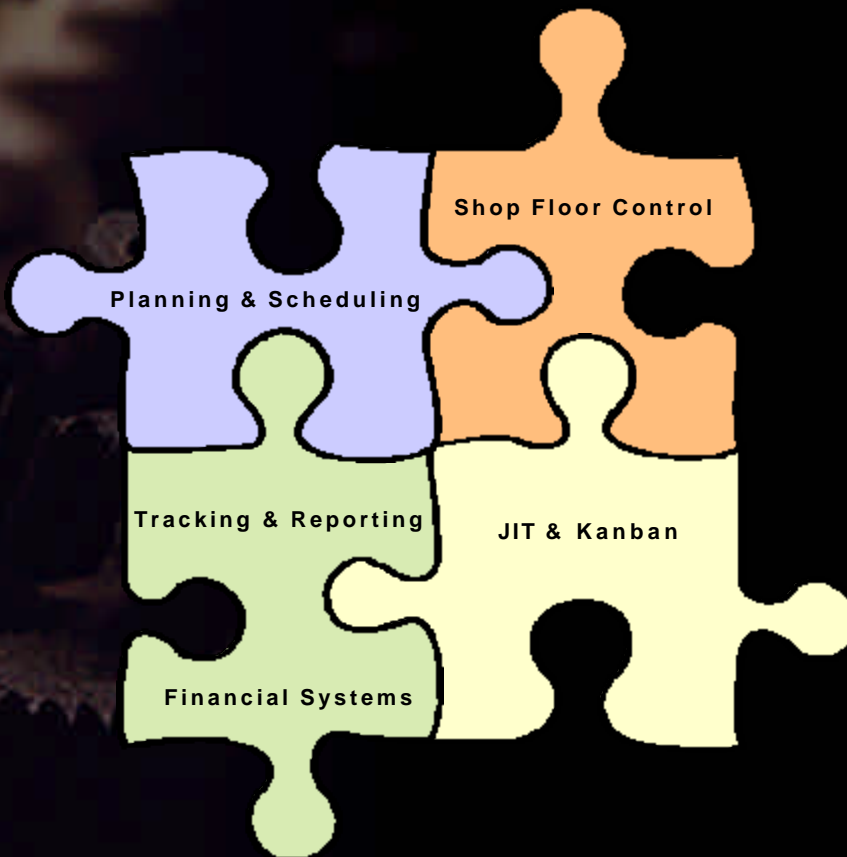
Doing the right “thing”:

- 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

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Thank You!

