Work Process Integration and System Planning

Or

The Science of Change

Presentation to

Northwest Construction Consumer Council

By

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Agenda

- How I came to the Science of Change?
- What are the Change Principles?
  - Lessons Learned
- How Do we Apply these Principles?
  - Method and Technique
- What Results can be Achieved?
  - Case Studies

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History Lesson

we could make much better software
than our Clients could implement.
…..the real problem was
not on the technology side,
on the business side.

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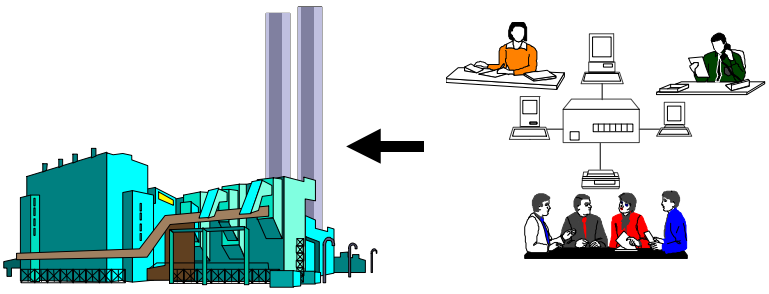
The Two Plants



You Must Pass Through the Information Plan

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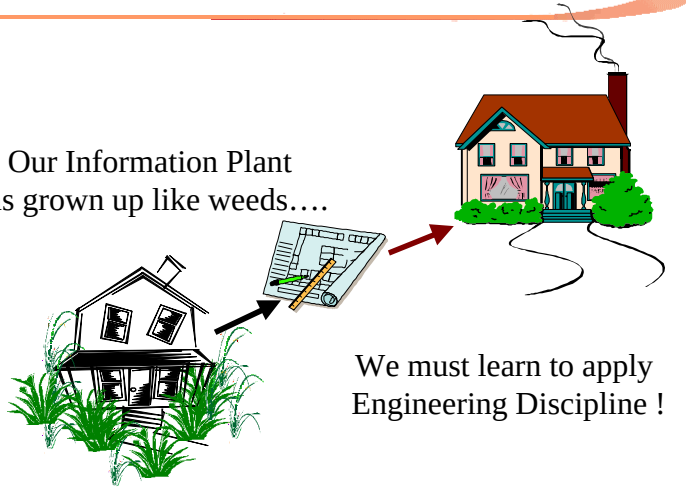
The Information Plant Problem

Our Information Plant
has grown up like weeds….



We must learn to apply
Engineering Discipline !

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The Science of Change

- It is a Messy World
  - Just because we can draw neat models does not mean we believe life can be this neat!
  - There will always be more name than fit in the Rolidex!
  - There will always be more things than we can do before noon!
  - There will always be things that don't work right!
  - There is more detail than we can ever deal with!

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- Chaos Theory
  - There is really order to the Messy World.
  - It is made up of complex arrangements of simple patterns.
  - When examined in the proper context the pattern appears.
  - Models help us understand these structures and deal with the messy world.
  - They help us bring a little order to a corner of the Messy World.

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- Systems Theory
  - Systems (Enterprises) are made of sub-systems
    - If the overall system is to operate optimally
    - The sub-systems will not operate optimally
  - Ignoring this principle
    - Causes inconsistent performance
    - Organizational Silos

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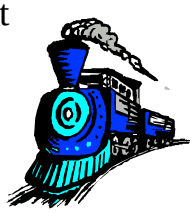
- Project Management
  - Scope Control
    - Resolving Out of Scope Issues
    - Keeping On Track
  - Management Commitment
    - Managing Expectation
    - Backing Results



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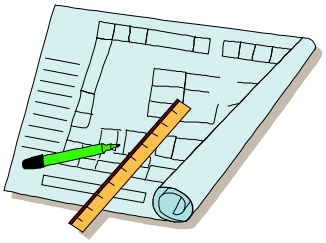
Change As An Applied Science

- MetaPower Methodology
  - Design Model
  - Project Model
  - Design Technology



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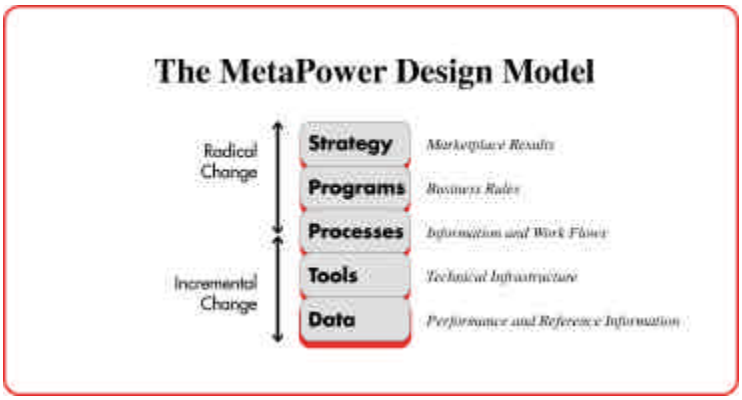
Change As An Applied Science



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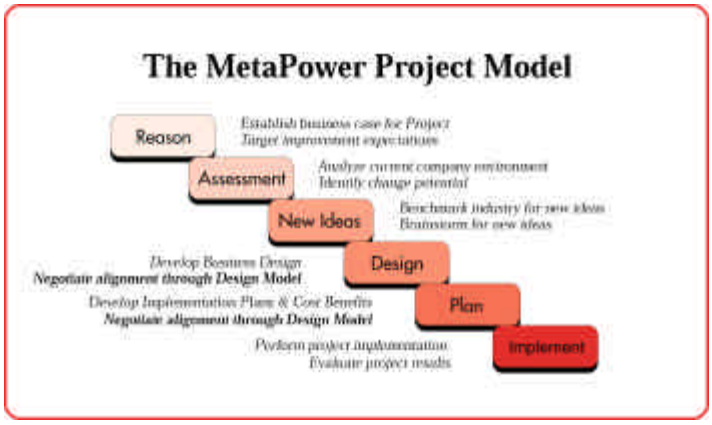
Change As An Applied Science



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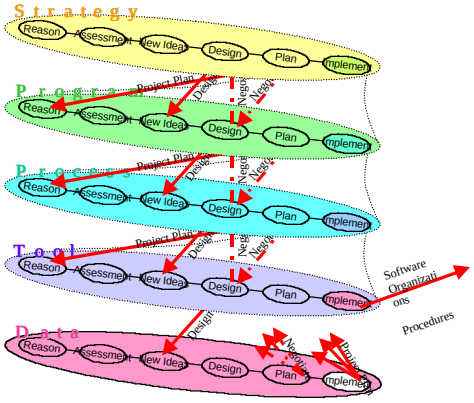
Putting It All together



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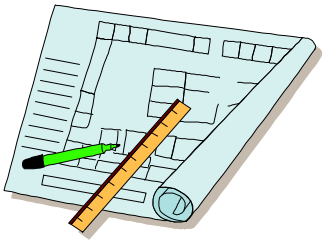
Change As An Applied Science

- Design Technology
  - Data Flow Diagrams
  - Data Dictionary
  - Logic Specifications



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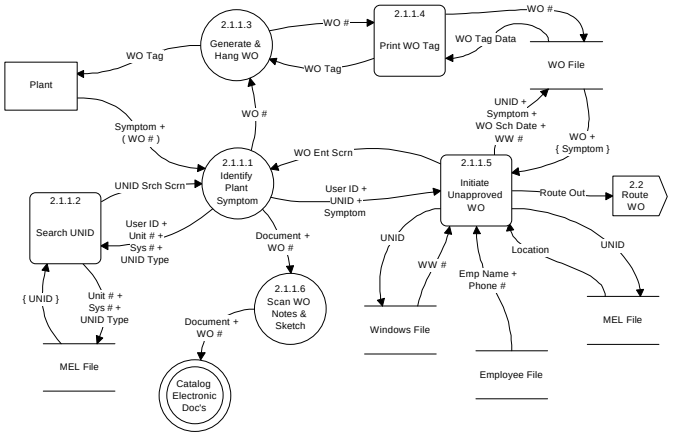
Sample DFD

"Initiate Unapproved Work Order"



Sample Data Dictionary

Equip ID # = * A unique number for a plant equipment that is registered in the EMS data base and used to identify equipment on a maintenance work order. *

Symptom = * A set of data that describes the equipment condition, the discovery of that condition and requests maintenance action. *
WO # + WO Prob Desc + Init UserID + Init Date + Init Time + Init Phone + Equip ID + Location + (MID + Source Doc Type + Source Doc #) + (SI# + SI Para) + (WO Tag? + # WO Tags) + WO Status

Wk Window Data = * A set of data that describes a condition in the plant that will enable certain equipment to be worked on in an outage condition. *
WW # + { Sys # } + Wk Window Sch Date + Wk Window Dur

Wk Window Sch Date = * The date on which a system Work Window begins and during which multiple work orders can be performed. *

WO # = * The unique identifier (number) for a work order. *

WO Tag = * A printed tag used to locate the equipment for which a work order has been written. *
WO Tag Data

WO Tag Data = * The set of data that is printed on a work order tag. *
WO # + WO Prob Desc + Equip ID + Equip Desc + Initiator + Init Date + Bar Code

"Sample" Logic Specification

UPON RECEIPT OF an **Equipment Symptom**:
IF the **Equipment Symptom** does not have an **Equip ID**,
DETERMINE the correct **Equip ID**.
IF **Equip ID** can not be determined,
PREPARE **Equip ID Search Request** WITH:
SET **System #** = **Equipment Symptom**'s **System #**.
SEND the **Equip ID Search Request** TO Search Sys Equip.
UPON RECEIPT OF the **Equip ID Search Results**:
DETERMINE the correct **Equip ID**.
SET **Equipment Symptom**'s **Equip ID** =
"Determined" **Equip ID.**
SEND the "Equip ID" **Equipment Symptom** TO Enter Equip System.

Case Studies

- TVA's Browns Ferry Nuclear Station
- Montana Power's Colstrip Station

Case Study

- TVA's Browns Ferry Nuclear Station
  - Activities
    - Process Design
    - Work Management Software Implementation
    - Document Management Implementation
  - Results
    - Presidential Award for Excellence
    - VP National Performance Review - Hammer Awards (2)
    - Reengineering Industry Association - Giga Excellence Award
    - Low Cost Nuclear Unit
    - 19 day Refueling Outage

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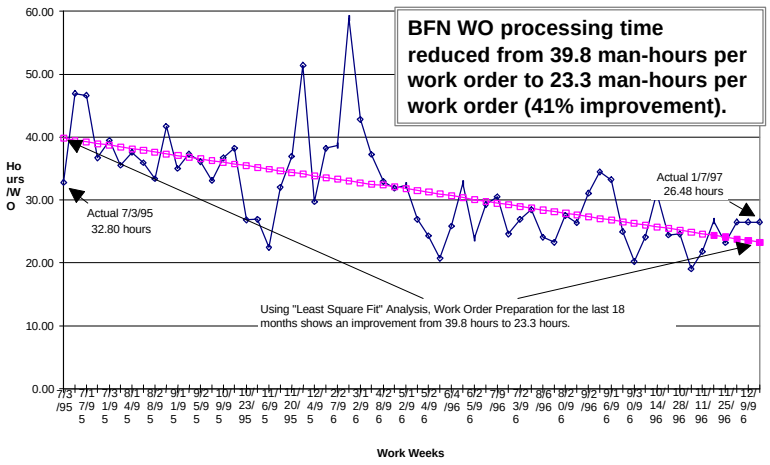
Work Order Processes - Savings



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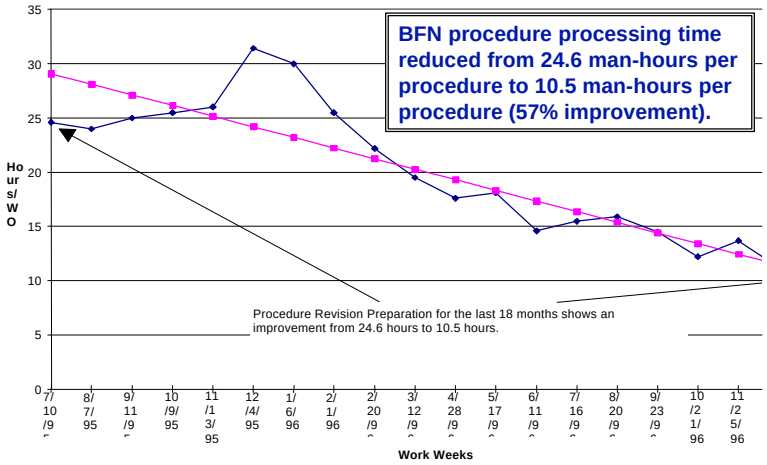
Procedure Process - Savings



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Browns Ferry Process Savings

Process	BFN Process Savings	Millions Per Year
Labor to plan, schedule and perform a work order	14.5 man-hour per work order savings	$ 4.5
Document management staff	N/A	$ 1.6
Labor to revise procedure	14.1 man-hours per procedure	$ 2.3
Total		$ 8.4

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Case Study

- Colstrip Station (Montana Power Co.)
  - Activities
    - Business Strategy
    - Reliability Base Production Program
    - Process Designs
    - System Designs
  - Results
    - Net generation is ***up 3.5%***
    - Non-fuel O&M costs are ***down 38%***
    - This results in $/MWh ***down 40%***
    - Opacity excesses are ***down 12%***
    - Recordable accidents are ***down 57%.***

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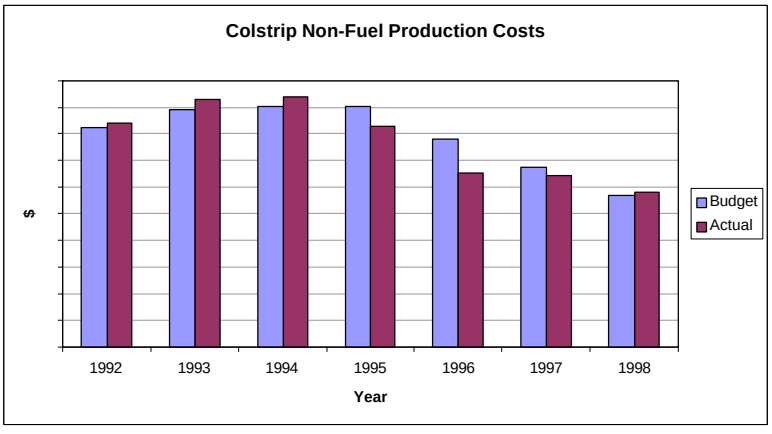
Colstrip Station - Case Study



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Summary

- *There is a science to changing business.*
- *It is important to covert this science to practice.*
- *It can produce significant if not dramatic results.*

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