

# The Information Organisation

Professor John Beckford  
Manchester Business School,  
23<sup>rd</sup> October 2013

# Themes for Today

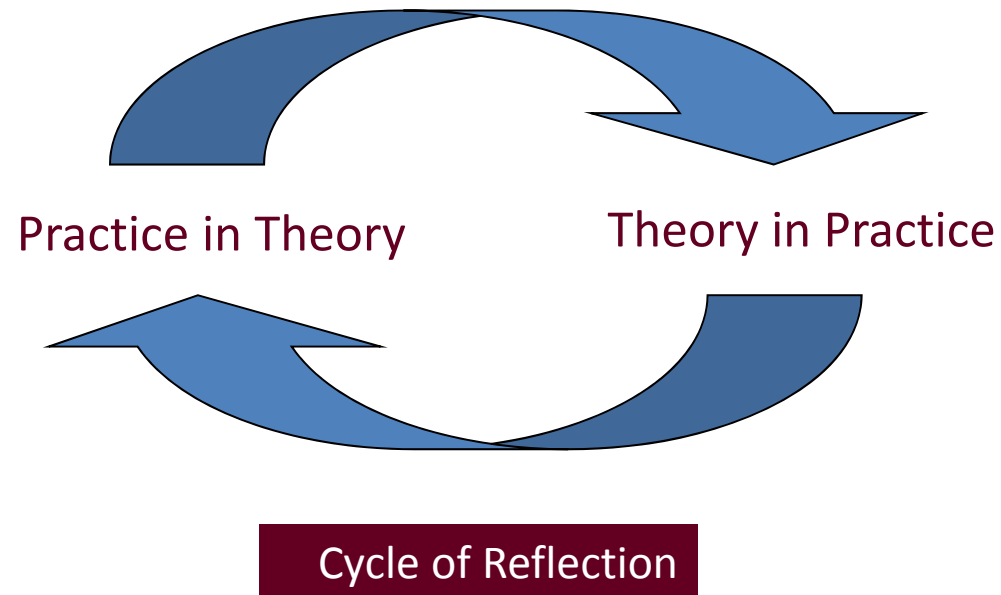
- The Information Challenge
- The Value of Information
- The Information Organisation
- The Information Factory
- Information for Adaptation
- Information for Performance

- PhD in Management Science (Hull)
- Visiting Professor, Dept. Of Information Science
- Fellow of the Cybernetics Society
- Member of the Institute of Management Services
- Fellow of the Royal Society of Arts
- Author of 'Quality' (Routledge, 3rd Edition, 2010)
- 60 + Papers and Articles, numerous 'talks'
- This talk – the basis of a book on Information Systems

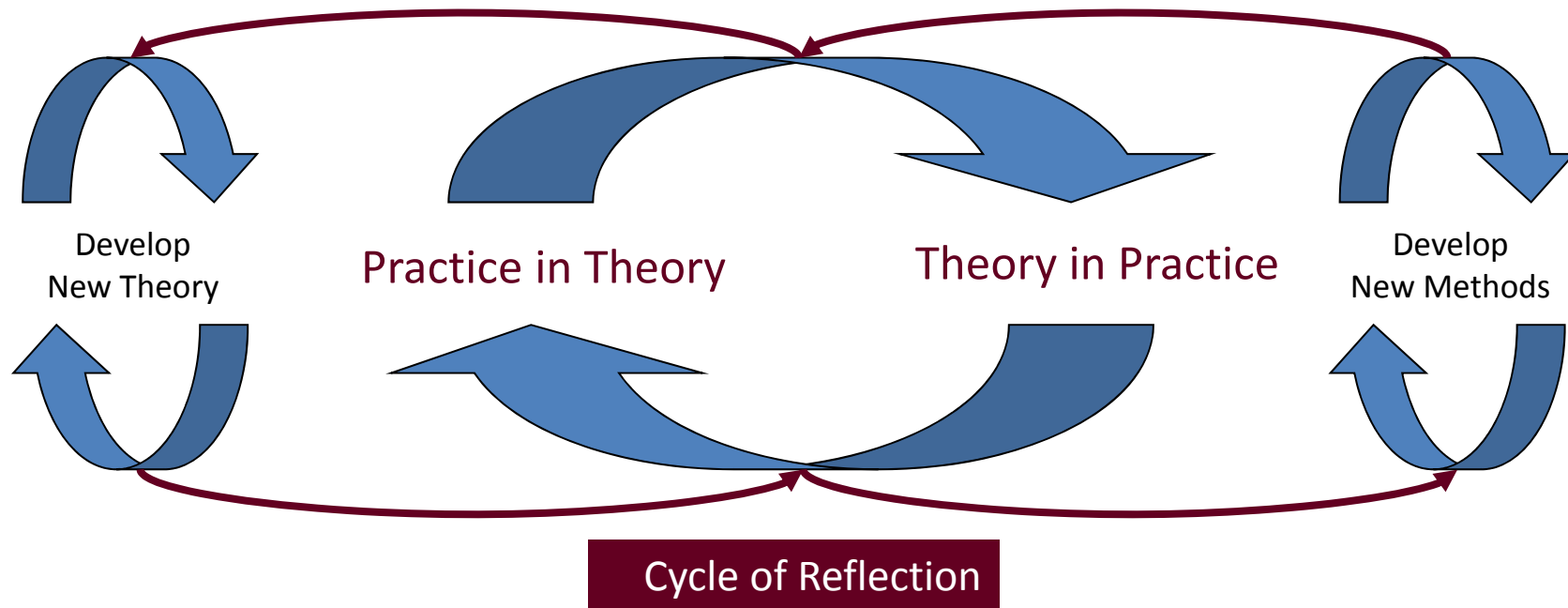
- The Passion
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  - At the limits of established thinking
  - Improvement will only arise from innovation
  - Most money spent on IT is wasted!

- The Passion
    - Deeply dysfunctional organisations
    - At the limits of established thinking
    - Improvement will only arise from innovation
    - Most money spent on IT is wasted!
  - My Approach
    - Treat the world as a laboratory
    - Demonstrate the power of ‘thinking’
      - Intractable problems
    - Create a virtuous (learning) cycle
-

# Virtuous Learning Cycle



# Virtuous Learning Cycle





# The Information Challenge



# The Information Challenge

- The 'hard' technology works

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- The 'hard' technology works
- Conventional approaches are failing
  - 'More of the same' is not working!
  - Look at the economy!
- Increasing demand for 'new' thinking
  - Greater willingness to engage
  - Reputation, experience, demonstrable success
  - Sustainability (viability) agenda

# The Information Challenge

- The 'hard' technology works
- Conventional approaches are failing
  - 'More of the same' is not working!
  - Look at the economy!
- Increasing demand for 'new' thinking
  - Greater willingness to engage
  - Reputation, experience, demonstrable success
  - Sustainability (viability) agenda
- Finding the scientific skills and knowledge
- The opportunities are out there!

- If these statements are true:
  - 80% of SAP clients disappointed in:
    - Benefits attained
    - Measurability of benefits
    - User competency
  - 90% of IT projects do not return real benefit
  - 40% fail completely
  - McKinsey
    - two thirds of CIOs admit that budgets don't have to be defended
  - Morgan Stanley
    - between 2000 and 2002 companies threw away over \$130 billion of their IT capital expenditure
  - HBR
    - 'IT doesn't matter'

then somebody somewhere  
**MUST** be doing something wrong

or, maybe, we are valuing  
and focusing on the wrong things!

# The Information Challenge: Convention

- Any organisation commissioning an IT/IS project will typically
  - measure the cost of:
    - hardware, software, configuration, customisation, training, business disruption
  - capitalise it all
  - measure the payback through:
    - reduced headcount, increased availability, better compliance, improved reporting, reduced 'clicks', improved appearance, better toys
  - hold nobody fully accountable for the difference
  - believe that IS is a 'necessary evil' and seek to minimise the costs it imposes on the organisation

# The Information Challenge: Convention

- Many people might be happier with:
  - The latest software
  - A blackberry
  - A smart phone, tablet, i-pad
  - A faster laptop
  - A wireless lan
  - A 3g card
  - A colour printer
  - A flat screen, a big screen, a big flat screen
- But
  - How much more productive, efficient, effective will they be?
  - How much better will the 'customer' be served?
  - How much better will they be able to do their jobs?

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# Not VERY!



# The Information Challenge UnConvention

- Often all we get is a faster, more efficient way of making the same mistakes
- These mistakes individually cost us less to make and we can make more of them more rapidly
  - An increase in productivity?
- The total cost of all the errors is greater than it was before!

# INFORMATION

is more important

than TECHNOLOGY

# The Information Challenge: UnConvention

- The truth seems to be:
  - The COSTS and PAYBACK are all measured in terms of the software, the toys and the people
  - The BENEFITS are all in the information!
- But we don't measure the VALUE of the information!

# The Information Challenge

- Getting beyond the hardware
- Defeating the sceptics
- Dealing with complexity
- Delivering claimed benefits
- Delivering value for money
- Demonstrating the value of information



# The Value of 'I'

- A utility
  - 200 applications (and rising!)
  - Capital spend on IS £10m+ annually!
  - IS Operational Expenditure £12m+ annually
  - Annual value of information provided?

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  - Annual value of information provided?
- Unknown
  - No one held to account for it
  - Basis of investment? Best endeavours!
  - AND
    - they don't have the right information to make good decisions!



- A small manufacturer
  - £24m t/o
  - 150 employees
  - low volume batching, high complexity product range
  - only use
    - on plant SCADA systems (not connected or integrated)
    - manufacturing planning system
    - accounts system
  - BUT business out of control
  - WHY? The data genie has escaped from the bottle!
    - uncontrolled, duplicated and triplicated, lacking integrity

# The Value of 'I'

- As matters stand today, many organisations are like this:
  - they don't know why they are buying what they buy
  - they don't know why they are using what they use
  - they really don't know what it costs (to buy or run)
  - they really don't know the value it provides

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  - they really don't know what it costs (to buy or run)
  - they really don't know the value it provides
- AND:
  - money is more easily spent on boxes and bellwire than on information
  - they spend on the 'S' when they SHOULD be investing in the 'I'!

# The Value of 'I'

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- How can that be expressed:
  - Improved response times to customers improve Customer Service
  - New opportunities recognised and responded to more effectively
  - Staff make better decisions
    - Spend LESS time collating data, more time analysing and using information
    - More 'informed' decisions, made more quickly
  - Reduce time to market
  - Adverse external events responded to more rapidly reducing losses
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- Value expressed in terms of the drivers of YOUR business

# The Value of 'I'

- And yes:
  - Total numbers employed can fall
  - The systems can be easier to use
  - There can be less duplication
  - Systems can be more up to date and more reliable
  
- ALL the conventional benefits can be realised as well!



# The Value of 'I'



# The Value of 'I'

- What IS the Value of 'I'?
  - The ability to achieve sustainable improvement in
    - CUSTOMER SERVICE
    - COMPETITIVE EDGE
    - COSTS
    - REVENUE

# The Value of 'I'

- What IS the Value of 'I'?
  - The ability to achieve sustainable improvement in
    - CUSTOMER SERVICE
    - COMPETITIVE EDGE
    - COSTS
    - REVENUE
- What do I need to know?
  - Information Value
    - What is a happy customer worth?
    - What is the value of time in the market?
    - What is the cost of a failure or error?
    - How many more might I produce and sell?

- How do I calculate Information Value
  - What is a happy customer worth?
    - Unit net value \* number of repeat customers \* number of purchase cycles
  - What is the value of time in the market?
    - Unit net value \* volume per day \* number of days advantage over competitors
  - What is the cost of a failure or error?
    - Cost per occurrence \* frequency \* days delay in the receipt of the information \* days required to design and implement a solution
  - How much more might I produce and sell?
    - Current capacity less Current volume \* unit net value \* number of days capacity not utilised
- Examples
  - Happy Customers, Logistics, Projects, Processes

# The Value of 'I'

- A registered social landlord was seeking to improve cost-effectiveness of operation
- Customer service costs were rising, income restricted by regulation
- A step change was needed in cost of service delivery to close the gap
- It was recognised that the principal activity of the organisation was data processing and THAT was mainly carried out by people
- A system – 'The Data Hut' was devised to automate the delivery and management of service activities
- The system, built as an integration layer to existing data systems, enabled BOTH a sustainable reduction in headcount (around 100 people) AND a sustainable improvement in service delivery
- Costs £400k, deliverable benefit year one £1m
- The Information Value: £600k per annum and rising

# The Value of 'I'

- A well known parcel distribution business was struggling to balance activity volume and staffing levels
- There was significant variance and unpredictability in daily volumes
- Its Information System led to substantial reporting delays
- Custom and practice informed all management decisions
- A daily reporting tool was constructed which:
  - analysed data in near real time
  - reported performance by individual, line, unit, shift
  - calculated the net value of change in staffing levels
- The information generated savings in staff cost of £15000 per day
  - The ANNUAL saving was £4.68m
  - The cost of the information provision was £120k
- The information value (so far!)
  - £4.68m \* 6 (years) - £120k = £29m

# The Value of 'I'

- A research organisation was seeking to optimise project life cycle to reduce time to market for new therapeutics
- The typical life cycle is 19 years from project inception to generic competition - entry to the market is typically at year 7
- The global market for each new therapeutic is £ billions
- A project simulation tool was devised:
  - simple modification of project plans in real time
  - assumptions, dependencies, resource allocations, activity durations
- The time to produce a revised plan was reduced from one month to one hour
- Project deliverables were recognised as deliverable up to one year earlier
- The Value of Information:
  - 12 months additional sales before generic competition
  - For EVERY project!

# The Value of 'I'

- A manufacturer was fighting in a tough business to increase output volume
- Every extra ton of output was worth £350 in the market
- Daily output was erratic and unpredictable
- The annual budget (300,000 tons) was consistently missed
- A production simulator was built which analysed the capacity of the whole plant and identified potential volumes for each element of the plant
- The capacities were discussed with the Production Team
- A plan was devised to systematically improve output and use the simulator to monitor volume
- Within 12 months the plant was producing in excess of 400,000 tons
- The Information Value:
  - $100,000 \text{ tons} * £350 * 3 \text{ (years)} = £105\text{m}$  additional revenue

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# The Value of 'I'

- Difficulty
  - Non-financial value can be difficult to measure!
- Ignorance
  - Lack of method, lack of skill, lack of data
- Assumptions
  - Unquestioned ways of working, unchallenged costs
- Politics (the CEO's favourite project!)
  - There will ALWAYS be one of these
  - Managing bad news
- Lack of breadth of understanding
  - There is ALMOST no such thing as an IT project
  - There are many INFORMATION projects
  - The costs are in the hardware, software, consultancy
  - The benefits are in the Information – but we don't measure that!

# The Value of 'I'

- What might be done differently?

# The Value of 'I'

- Understand that:
  - NO Information System or Project has an automatic right to exist!
  - SOME have no visible payback
- Develop a Project Planning/Business Case approach that:
  - is rigorous and transparent
  - addresses 'hard' issues
    - visible costs and benefits
  - exposes hidden costs and benefits
    - steering & stakeholder costs
    - behavioural benefits, learning
    - time to market, reduced errors, increased volumes
  - identifies 'political' aspects of the project
- Be brave!

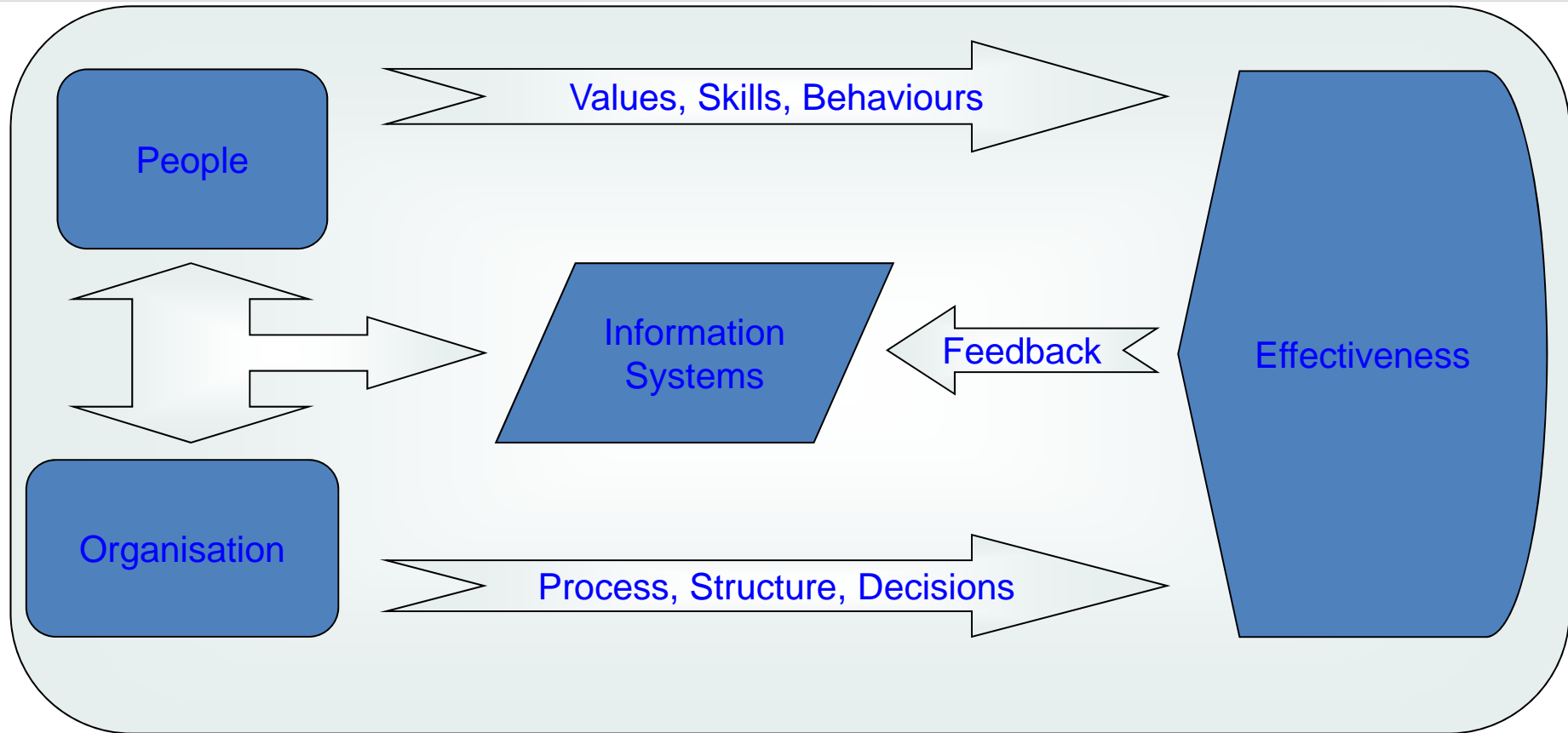
# The Value of 'I'

- The financial measures remain the same:
  - $\text{£ Cost} / \text{£ Benefit} * 100/1 = \%RoI!$
  - That's not going to change – it's how the sums work!
- What is different?
  - The costs and benefits address the wider business implications
  - Non-financial benefits and costs are understood
  - The basis of measurement is shifted from 'pure' financial measures to a range of quantitative AND qualitative measures
  - There is greater understanding and appreciation of the project itself – and the consequence of THAT is greater commitment!

# Designing the Information Organisation

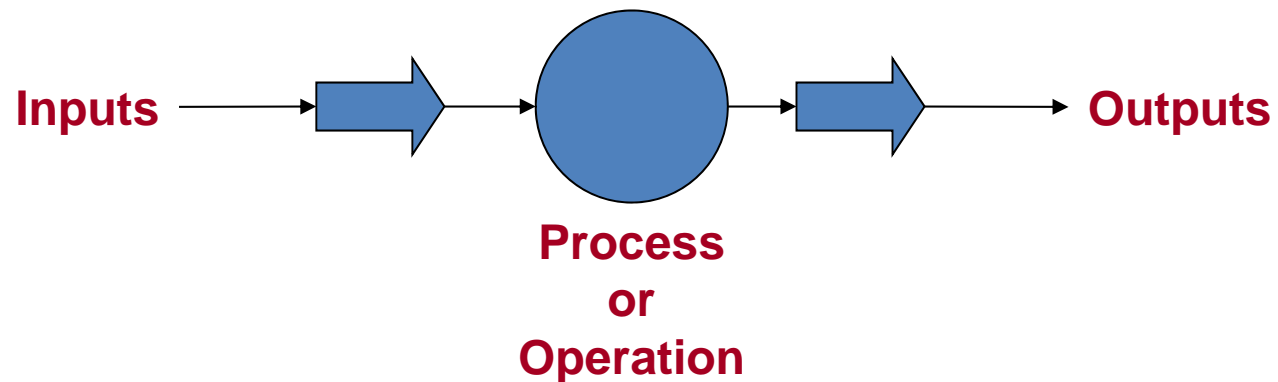
- A homeostat
  - a machine for synthesising the argument!

# Designing the Information Organisation



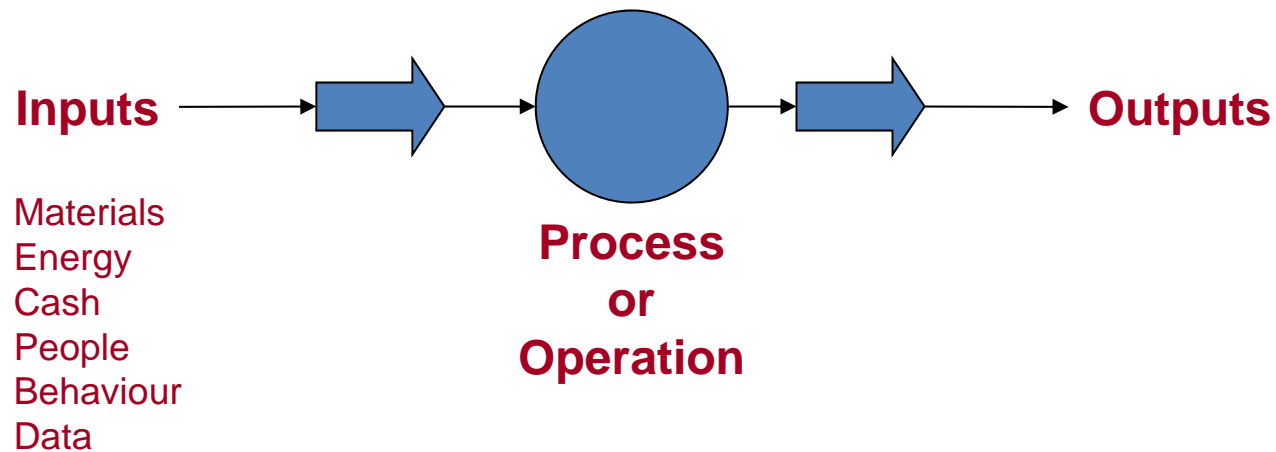
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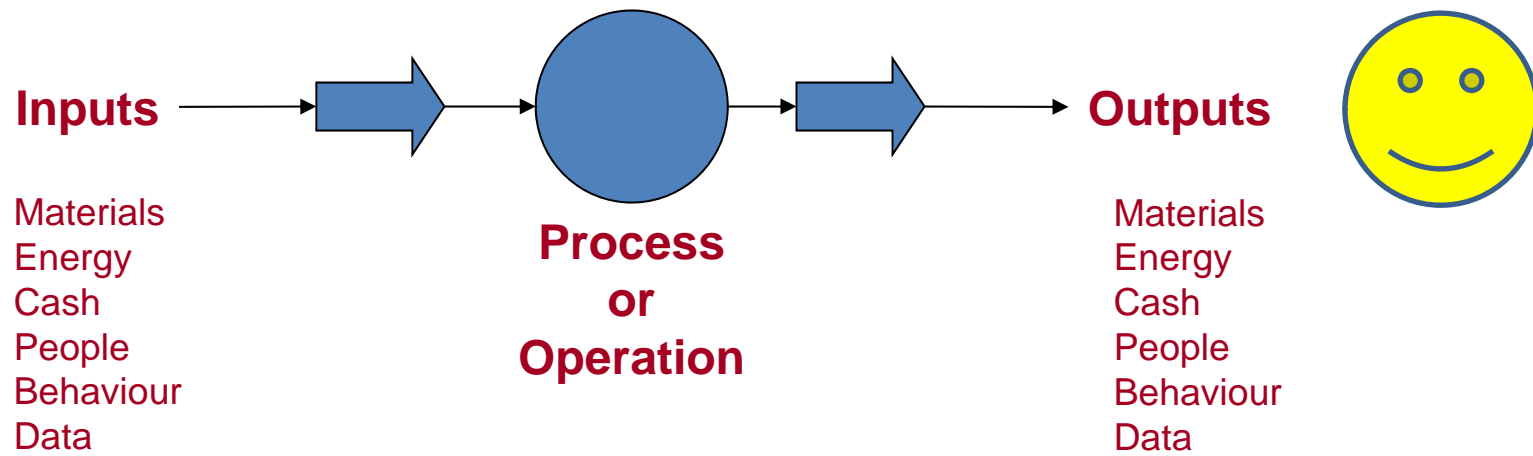
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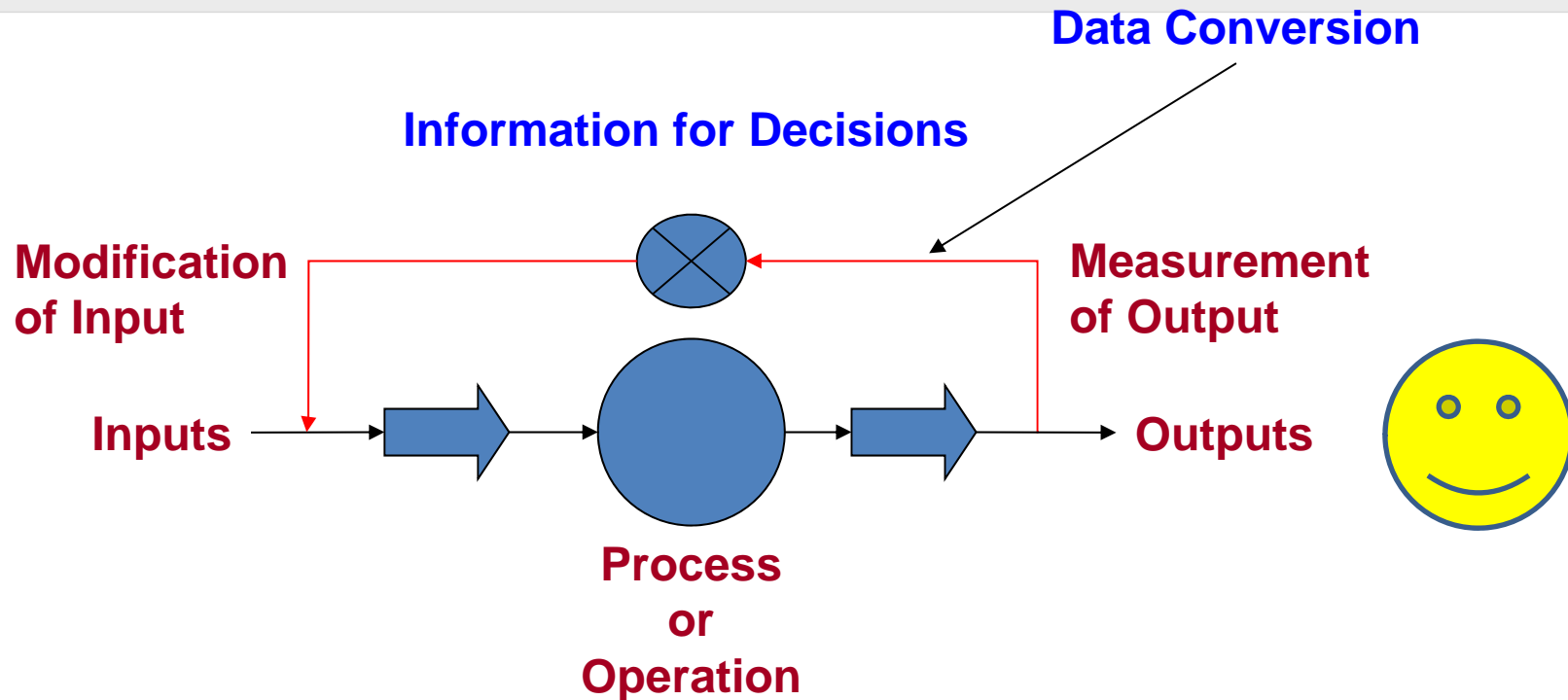


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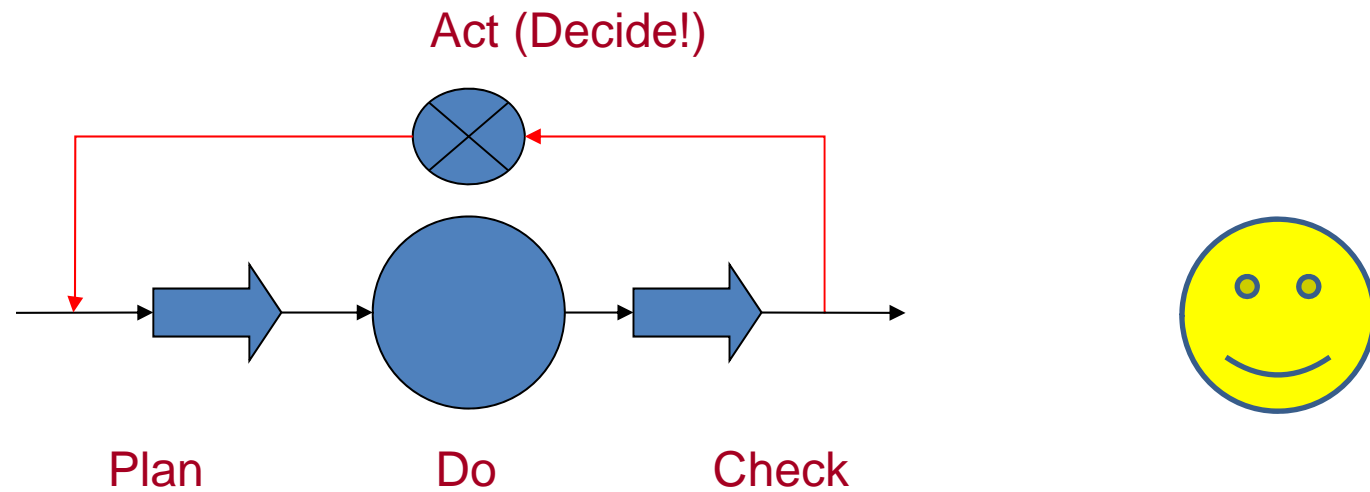
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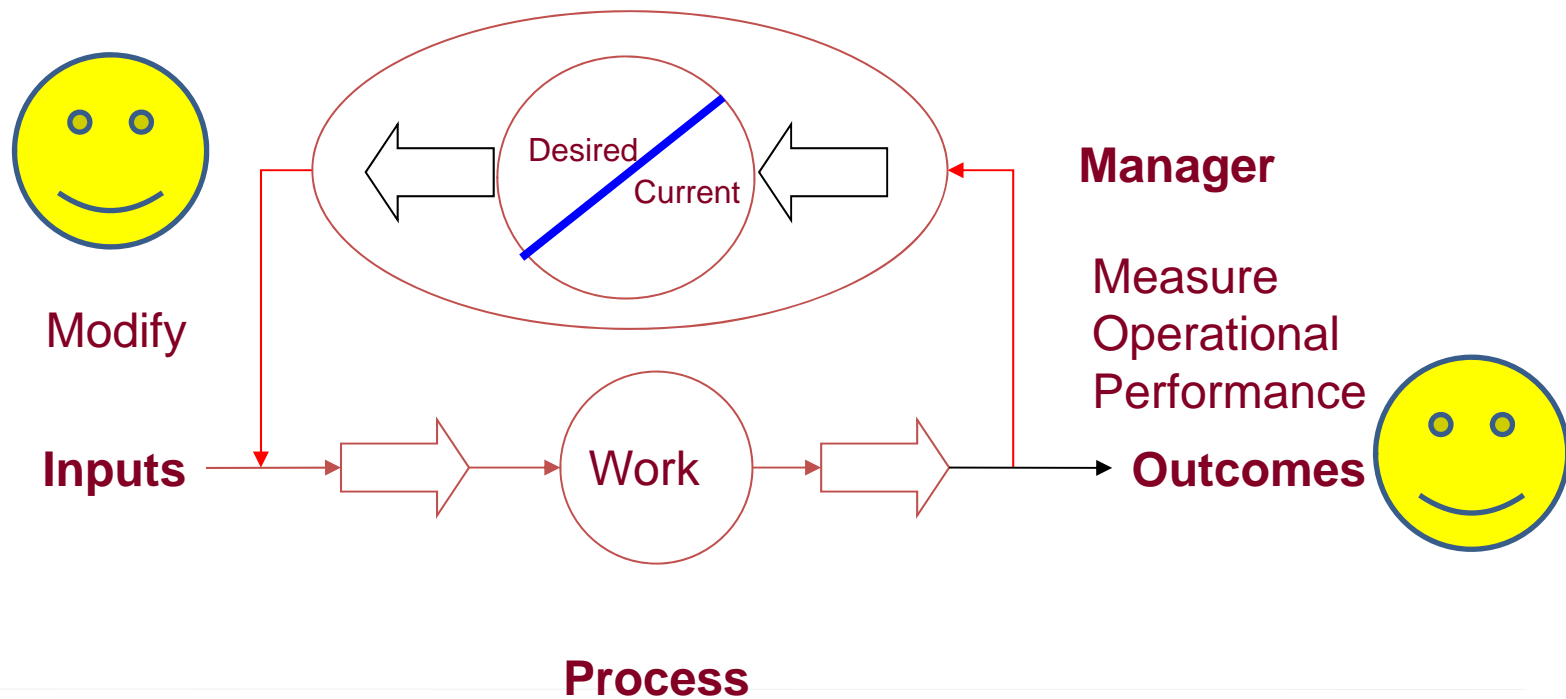
# Designing the Information Organisation



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Direct Relevance:

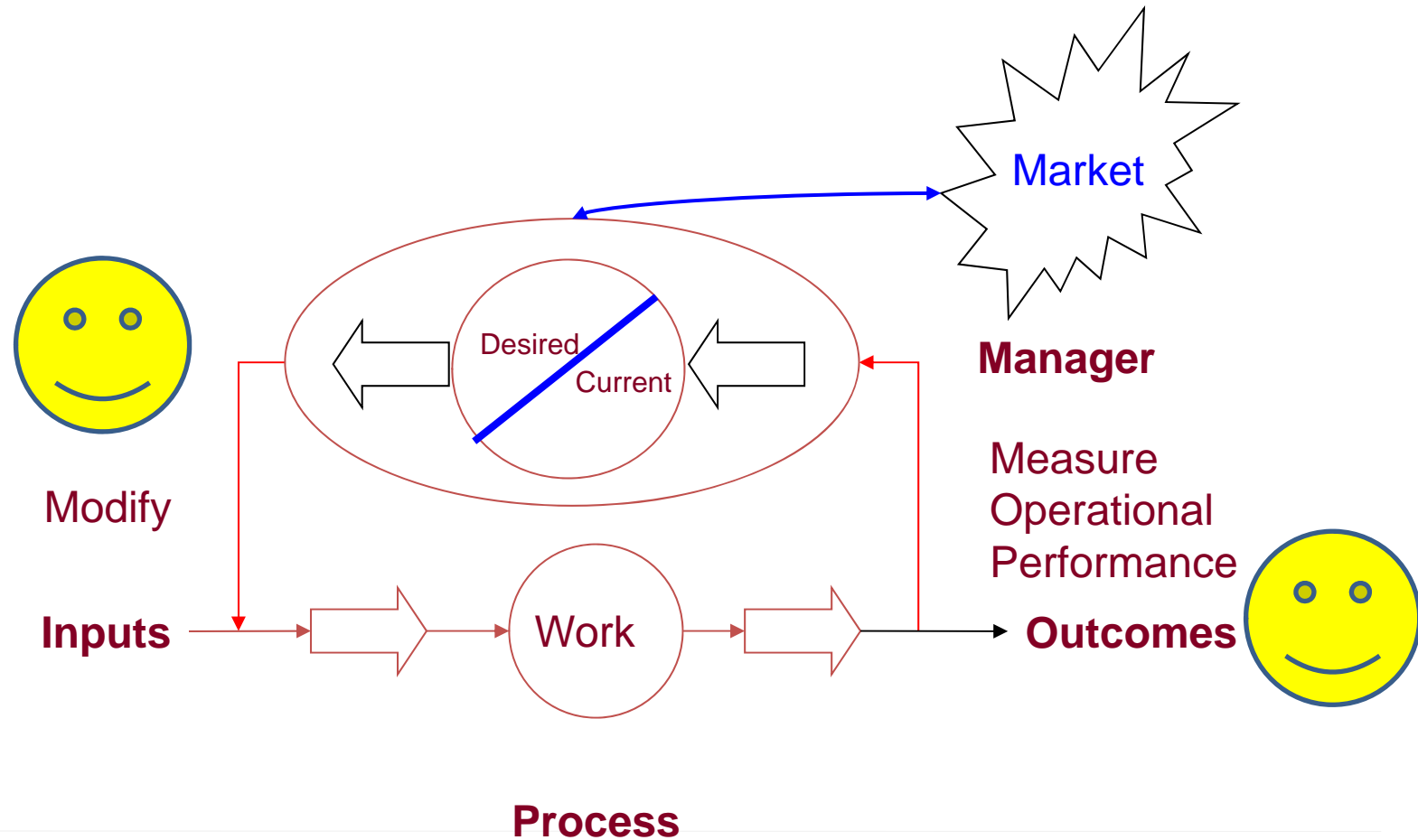
Did the actual (current) output of the process equal the desired output?



# Designing the Information Organisation

Contextual Relevance 1:

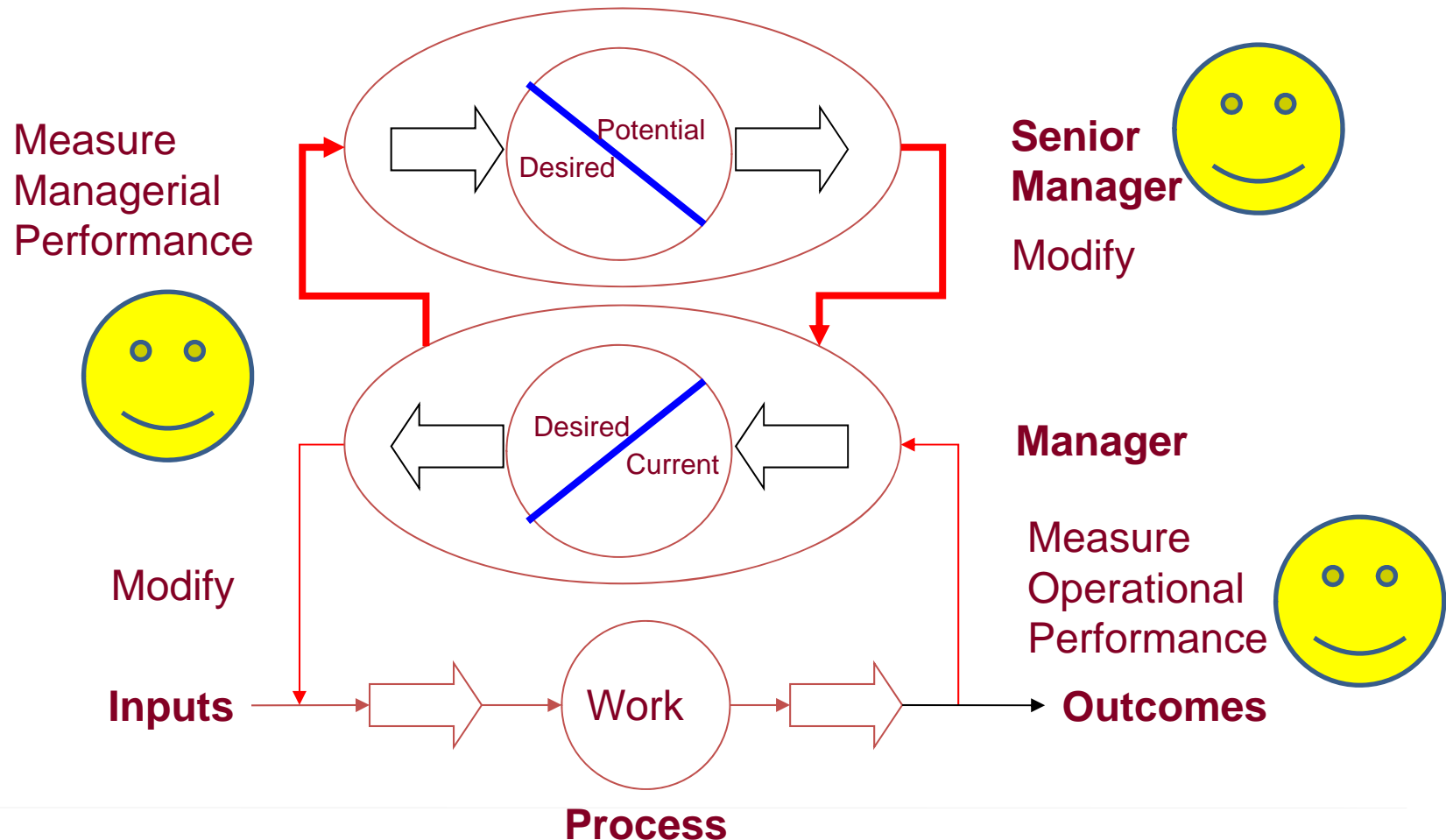
Did the actual (current) output of the process equal the needs of the market?



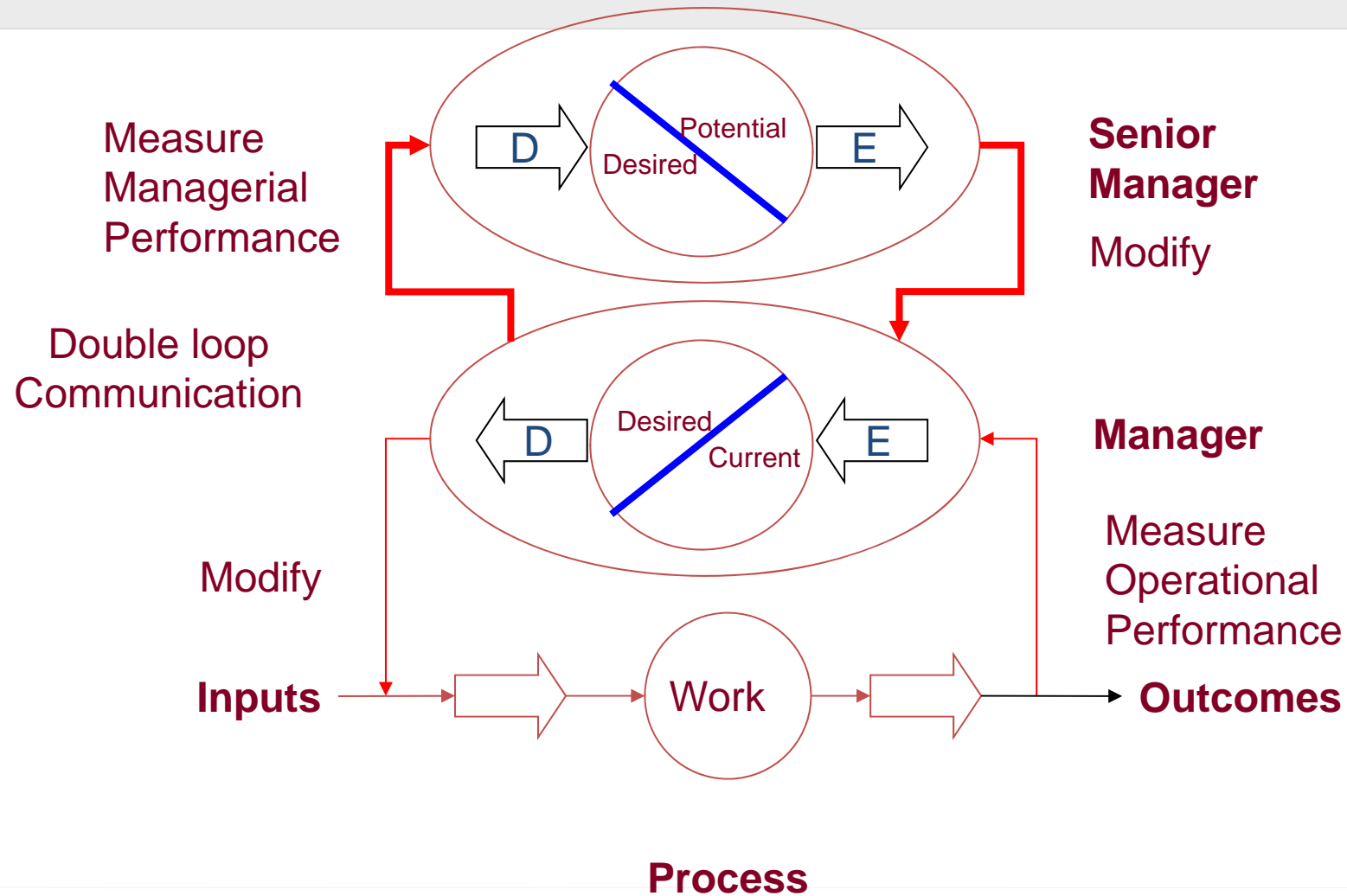
# Designing the Information Organisation

Contextual Relevance 2:

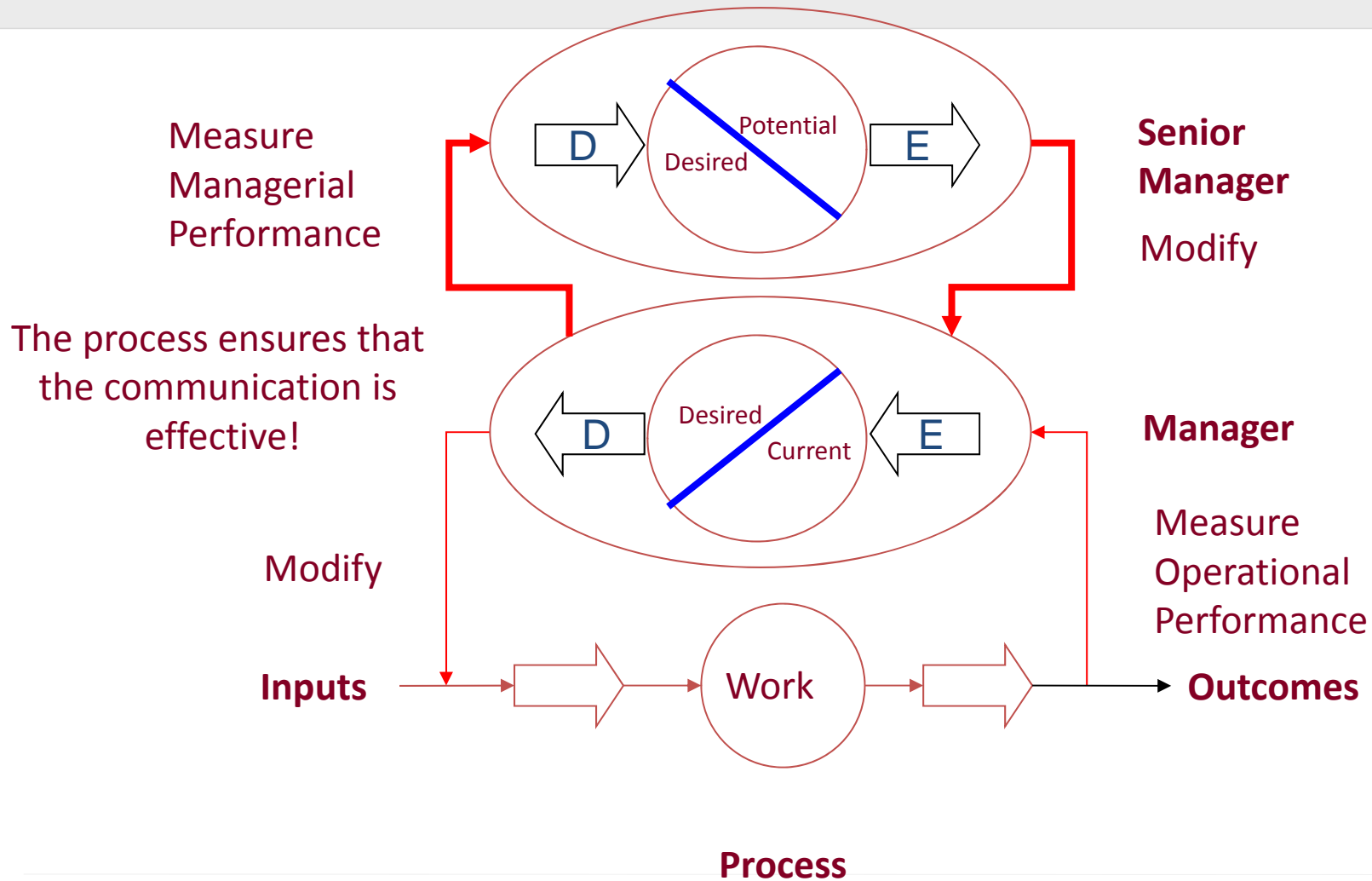
Did the actual (current) output of the process equal the expectations of the boss?



# Designing the Information Organisation

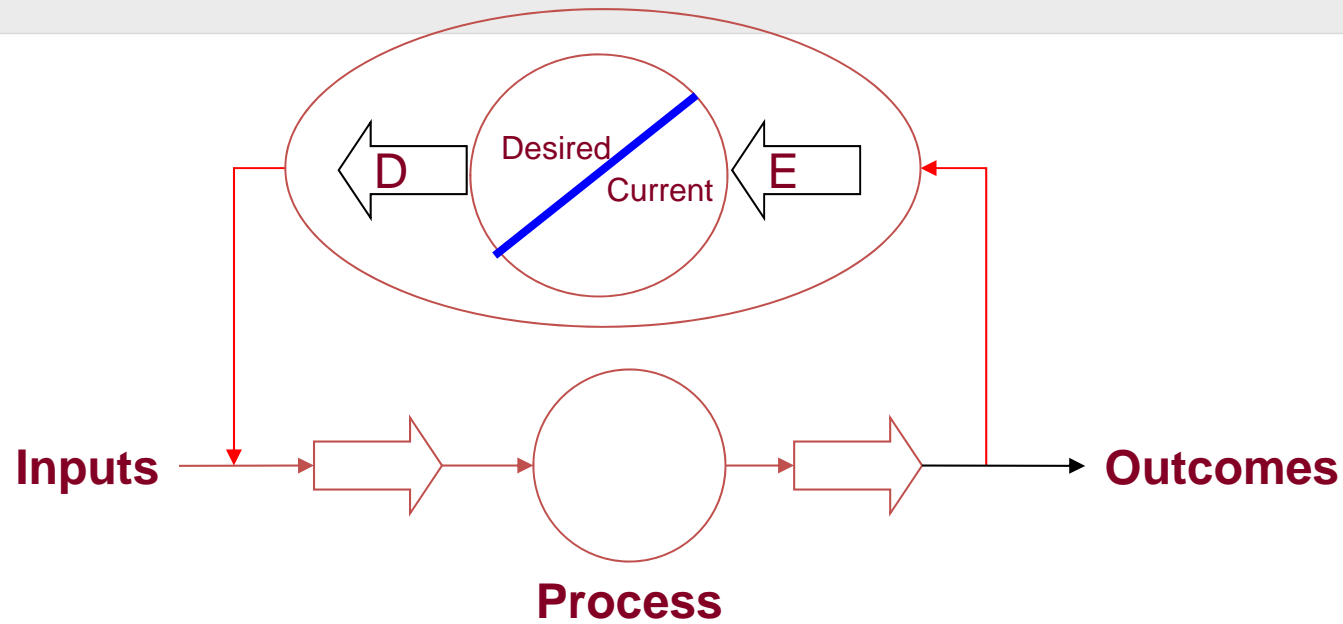


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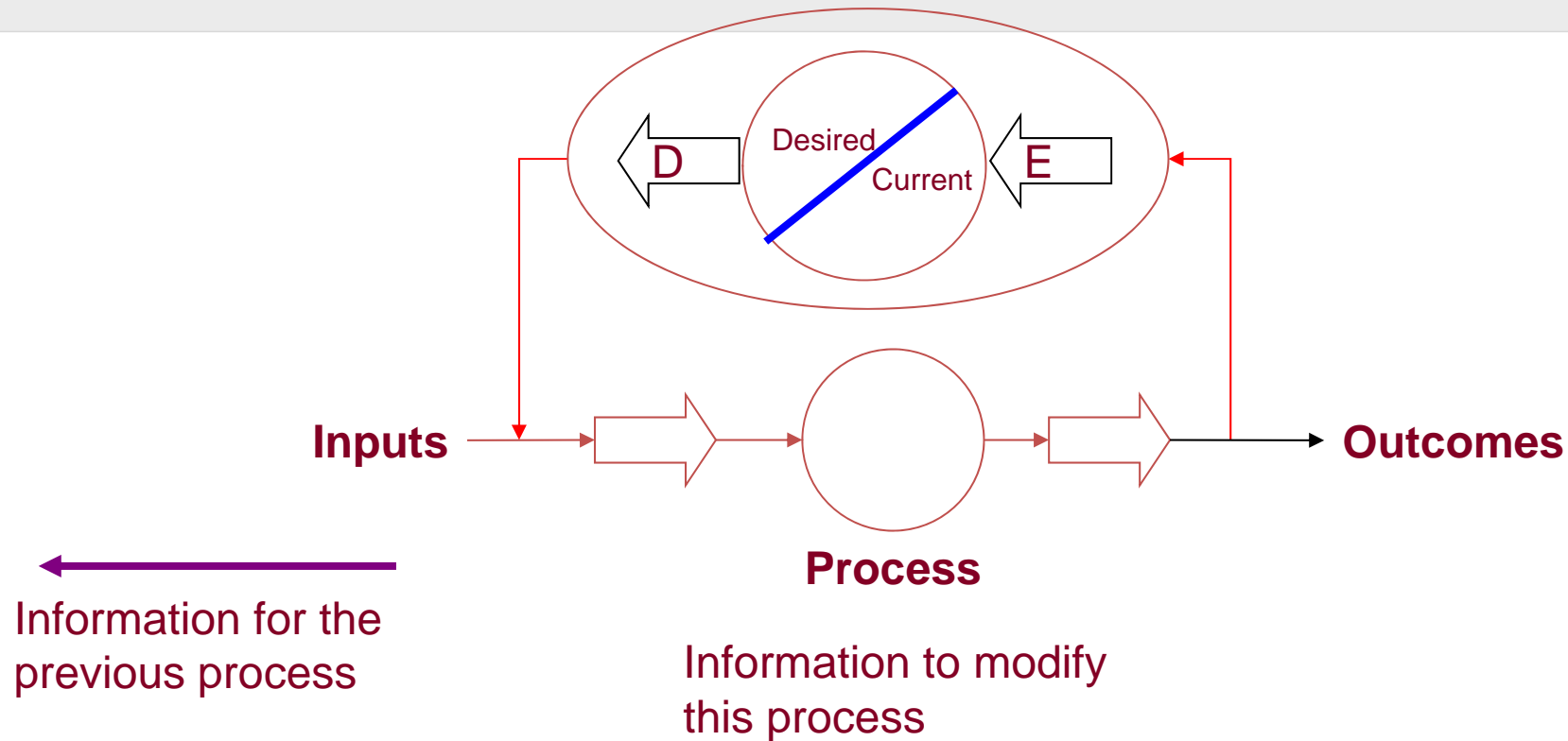


# Designing the Information Manager Organisation

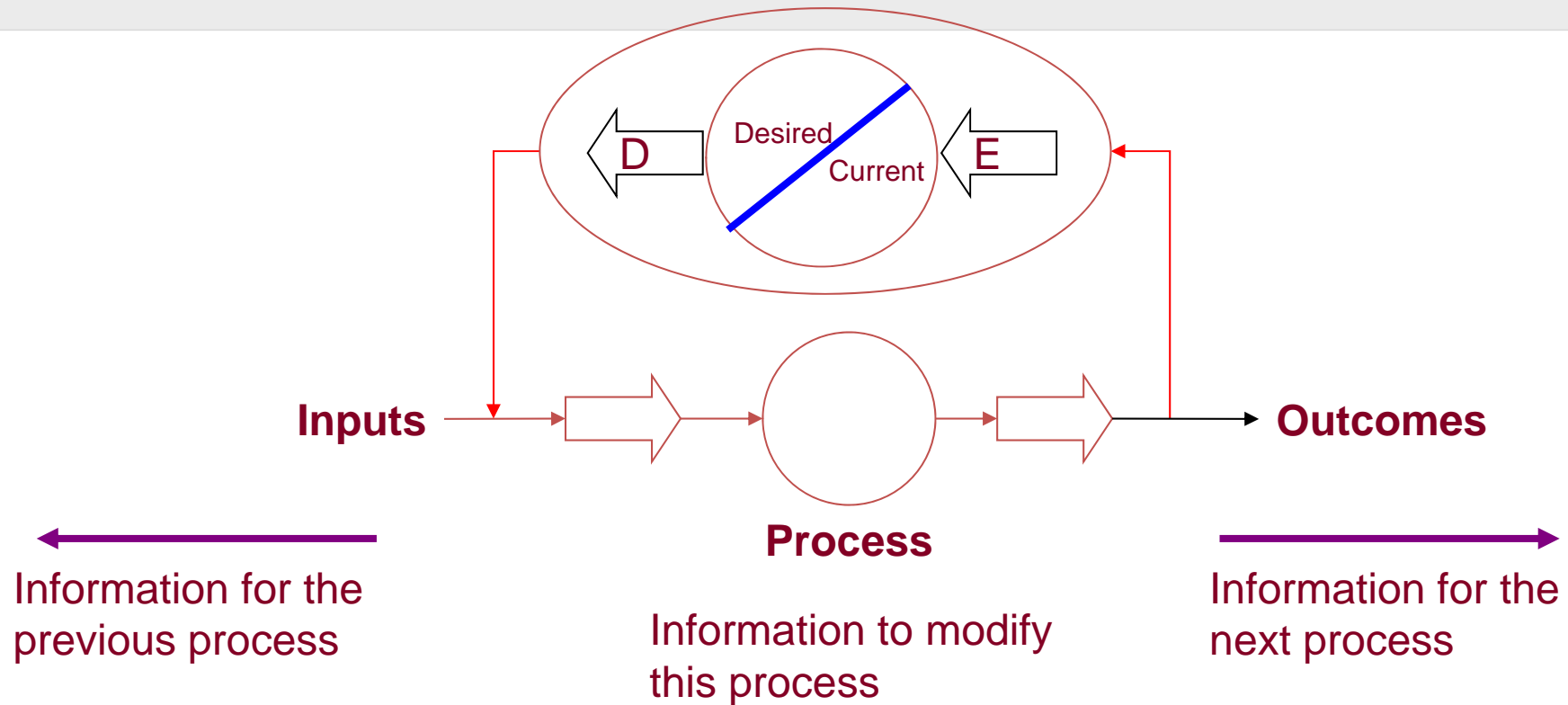


Information to modify  
this process

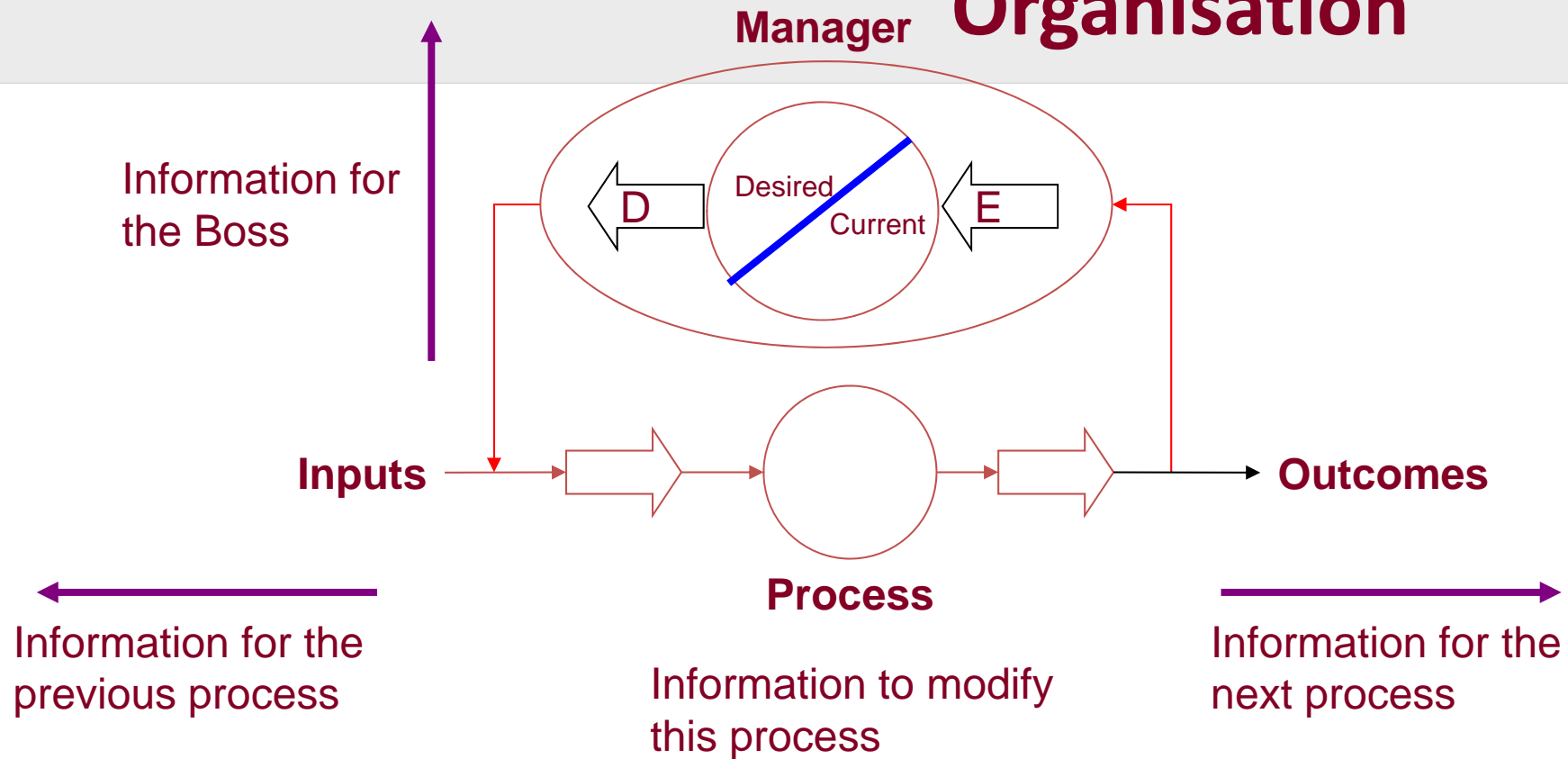
# Designing the Information Manager Organisation



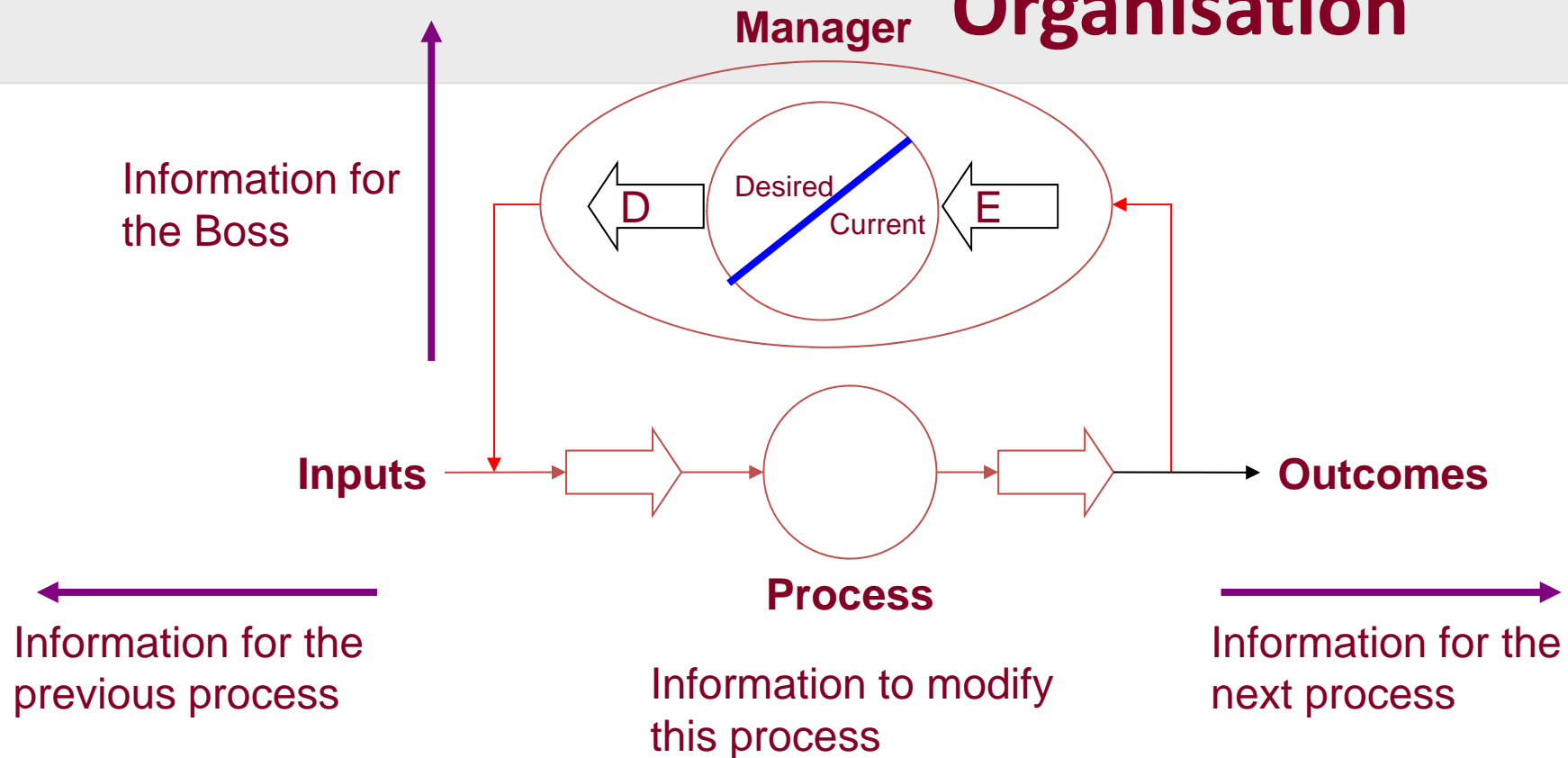
# Designing the Information Manager Organisation



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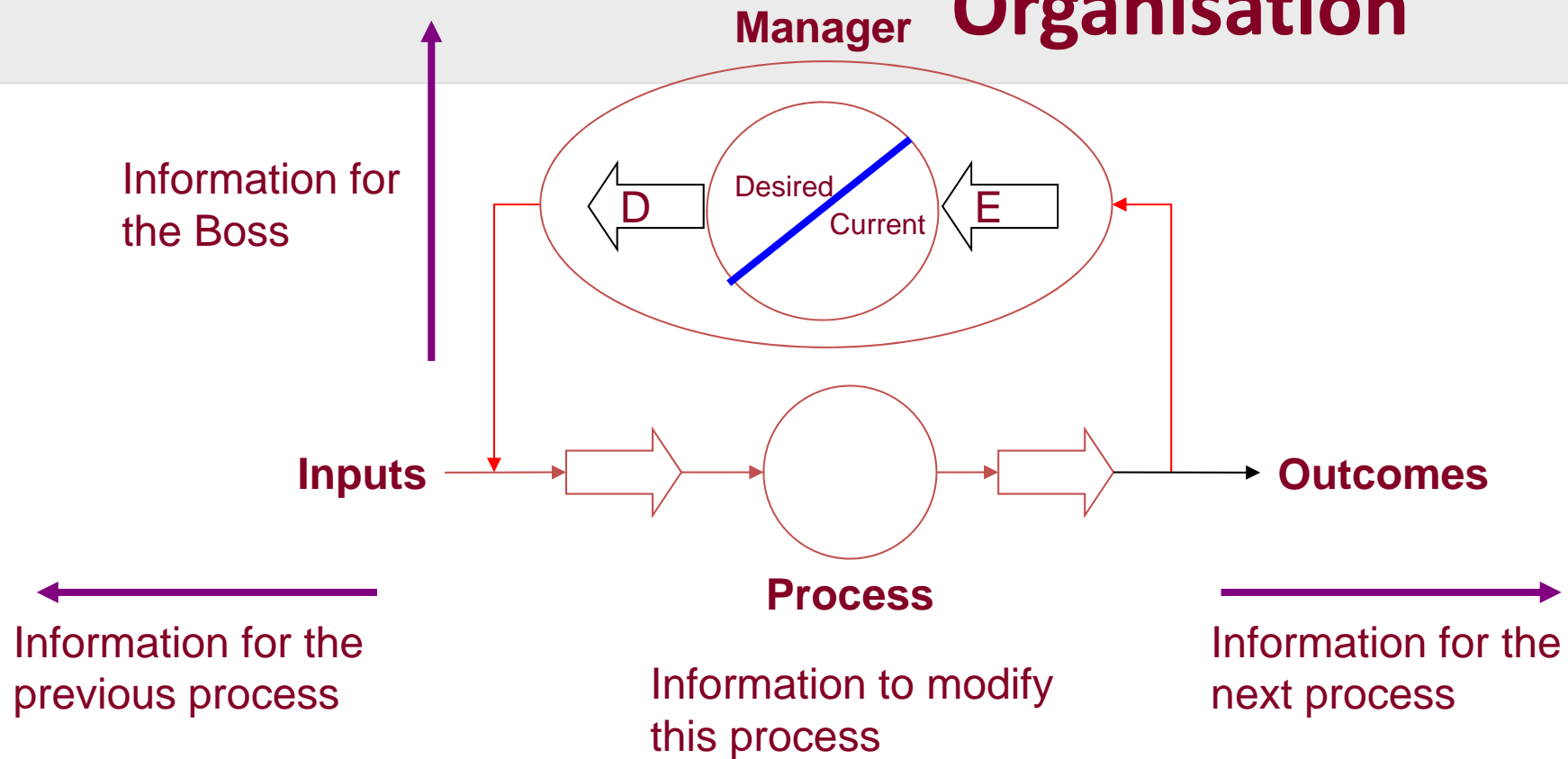


# Designing the Information Organisation



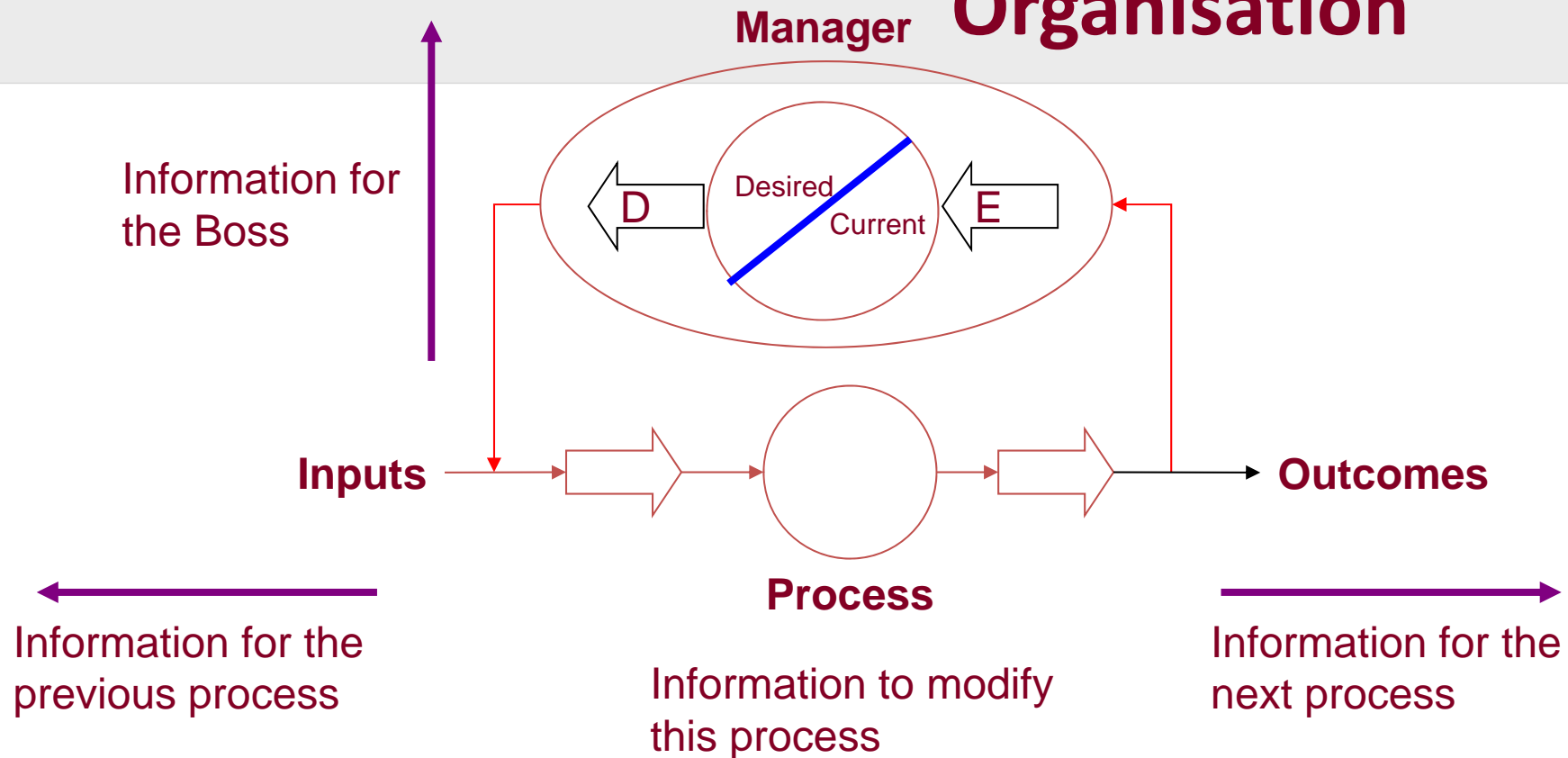
Vital to discriminate those things controlled HERE from those things controlled ELSEWHERE!

# Designing the Information Organisation



Vital to discriminate WHICH information is being used for what purpose!

# Designing the Information Organisation



We cannot fix the things we don't control!

# Designing the Information Organisation

- Decisions are often programmatic
  - they are a function of a prior decision and a stated objective
  - the reports are needed to trigger the appropriate organisational response
    - Fix it, stop it, do it again, do it the same but faster, cleaner cheaper....
- IT can be great at
  - programmatic reporting
  - decision support
- Let's design systems that let the machines do well what THEY do well – and free the people up for the real work!





# The Information Factory

# The Information Factory

- So, what has happened?
  - Why is it a problem?
-

# The Information Factory

- So, what has happened?
- Why is it a problem?
  - Our ability to process data has increased exponentially
  - Data is multiplied, often hundreds of times
    - Email chains?
  - We put so much time into data processing we have no time left for turning it into information

# The Information Factory

- How often do we hear:
  - “We don’t have enough.....”
  - “We don’t have the right .....”
  - “How can I make a decision with....”
  - “What we need round here is a better information system”

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# The Information Factory

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  - “We don’t have the right .....”
  - “How can I make a decision with....”
  - “What we need round here is a better information system”
- Truth is most managers are overwhelmed with data
  - BUT data is NOT information
  - Data has no context, no connectivity, no meaning
  - It only becomes information when we can do something with it!

# The Information Factory

- Bragging rights?
  - Paper and Steel - Tonnage
  - The ‘Information Industry’?

# The Information Factory

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- Bragging rights?
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      - The number of racks in the server farm?
    - What about SMART Infrastructure?
      - Number of devices?
      - Frequency of transmission?
      - Volume of data?
-

- What about SMART Infrastructure?
    - Number of devices?
    - Frequency of transmission?
    - Volume of data?
  - Example?
  - How about the VALUE of the INFORMATION?
    - What we can DO with it?
      - Improve capacity and utilisation
      - Improved reliability and uptime
      - Reduced operating and maintenance costs
-

- How about the VALUE of the INFORMATION?
  - What we can DO with it?
    - Improve capacity and utilisation
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    - Reduced operating and maintenance costs
- Data generates COST

Information generates VALUE

---

# The Information Factory

- The NHS Electronic Health Record System
  - The Child Support Agency
  - CJIT (Criminal Justice IT System)
  - Border Controls
  - FiReControl
  - Tax Credits
  - ID Cards
  - Defence Procurement
  - Integrated Tax and Social Security (coming your way soon!)
-

# The Information Factory

- “Every time Whitehall has made the case for technological innovation on the grounds of efficiency, it has ended up costing more not less”
  - *Daily Telegraph, 20<sup>th</sup> September 2011*

# The Information Factory

- Information lets us make decisions
  - For data to become information it must be presented
    - in context
    - in relation to other relevant data
    - in the right quantities
    - at the right time
    - in comparison to ‘model’ data (the desired outcome) which enables a decision to be made about change or improvement
  - Decisions are not just about having the right data – but about asking the right questions and ‘manufacturing’ the information!
-

# The Information Factory

- Establish NOT

what questions we can answer given the data we have

BUT

what questions we need to answer and what data is  
required to do so!

---





# The Information Factory

- The Data Proliferation Engine

- How has this come about?
  - 1973 Texas Instruments Calculator
  - 1976 IBM3982 Golf Ball Terminal
  - 1980 Word processors
  - 1983 Personal Computers
  - 1990 Apple Power Book
  - 1995 Desktop Computing & Internet
  - 2000 PDA's & broadband
  - 2005/6 Smartphones and Blackberries
  - 2008/9 Tablets
  - 2013 'I' EVERYTHING

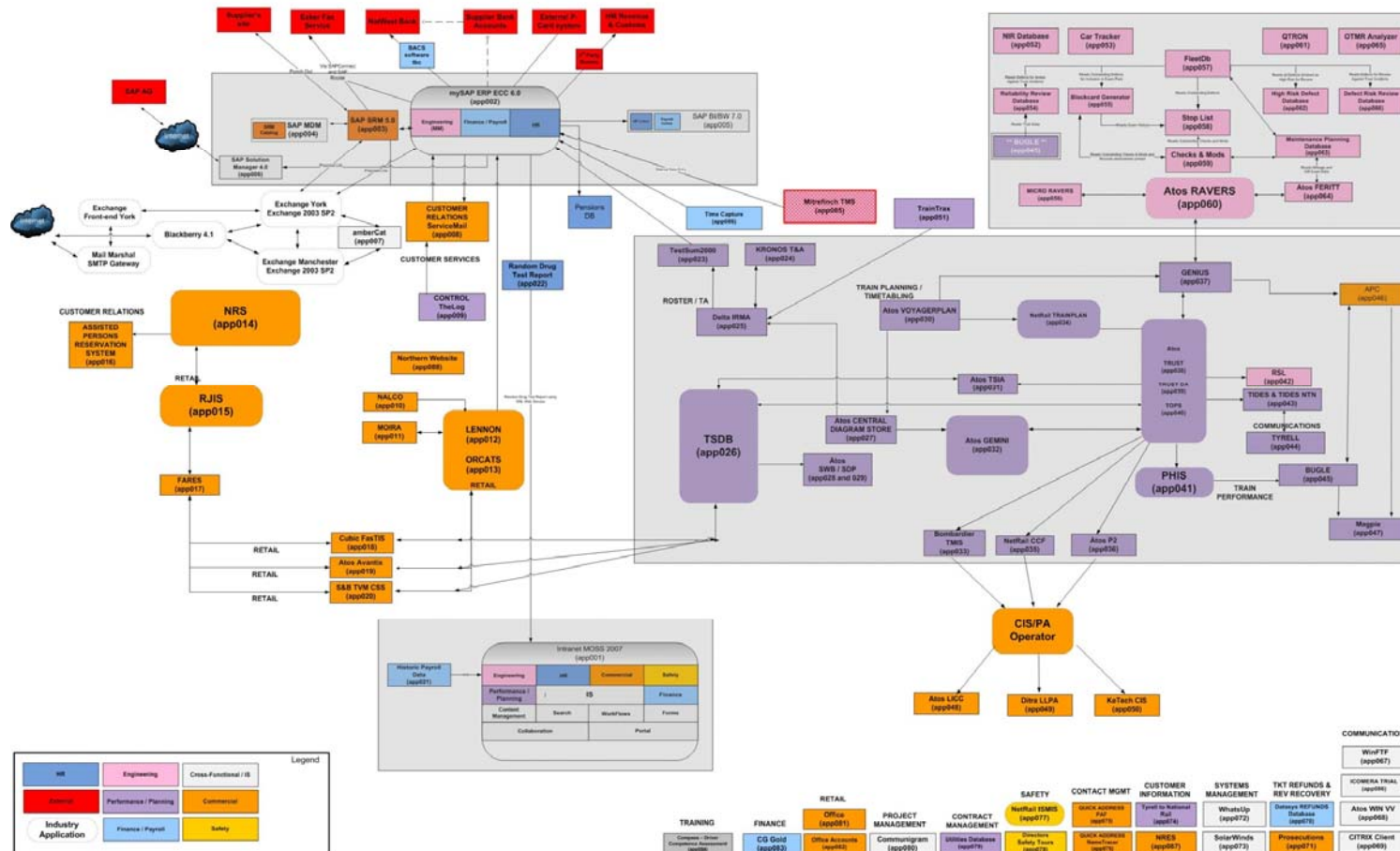
- How has this come about?
    - Our ability to process data has increased exponentially
    - Data is multiplied, often hundreds of times
      - Email chains?
    - We put so much time into data processing we have no time left for turning it into information
  - Enablers?
    - Cheap, powerful devices
    - Cheap, fast, data transmission
    - Cheap, easy storage
-

# The Information Factory

- How has this come about?
  - Reductions in cost, increases in speed!
  - It is, relatively, easy to explain and justify grey boxes and bellwire
    - And they can be admired, polished, depreciated and pictured in the annual report
    - And they can be fitted into a 'rolling replacement' cycle!

# The Information Factory

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  - It is, relatively, easy to explain and justify grey boxes and bellwires
    - And they can be admired, polished, depreciated and pictured in the annual report
    - And they can be fitted into a 'rolling replacement' cycle!
  - It is, relatively, hard to explain information!
    - it is, largely, invisible
    - It is difficult to 'count' (so we don't bother)
    - very hard to admire
    - it's 'value' is poorly understood and, after the first report, the audience always wants more
      - 'can you make it do.....?'
      - The 'customer' is always disappointed!



# The

# Information

# Factory

150k excel spreadsheets

5000 access databases

103 business systems

507 locations

Direct 1 to 1s

352 managers

Department Meetings

5 regulators

Section Heads

Individual Performance

Board Meeting

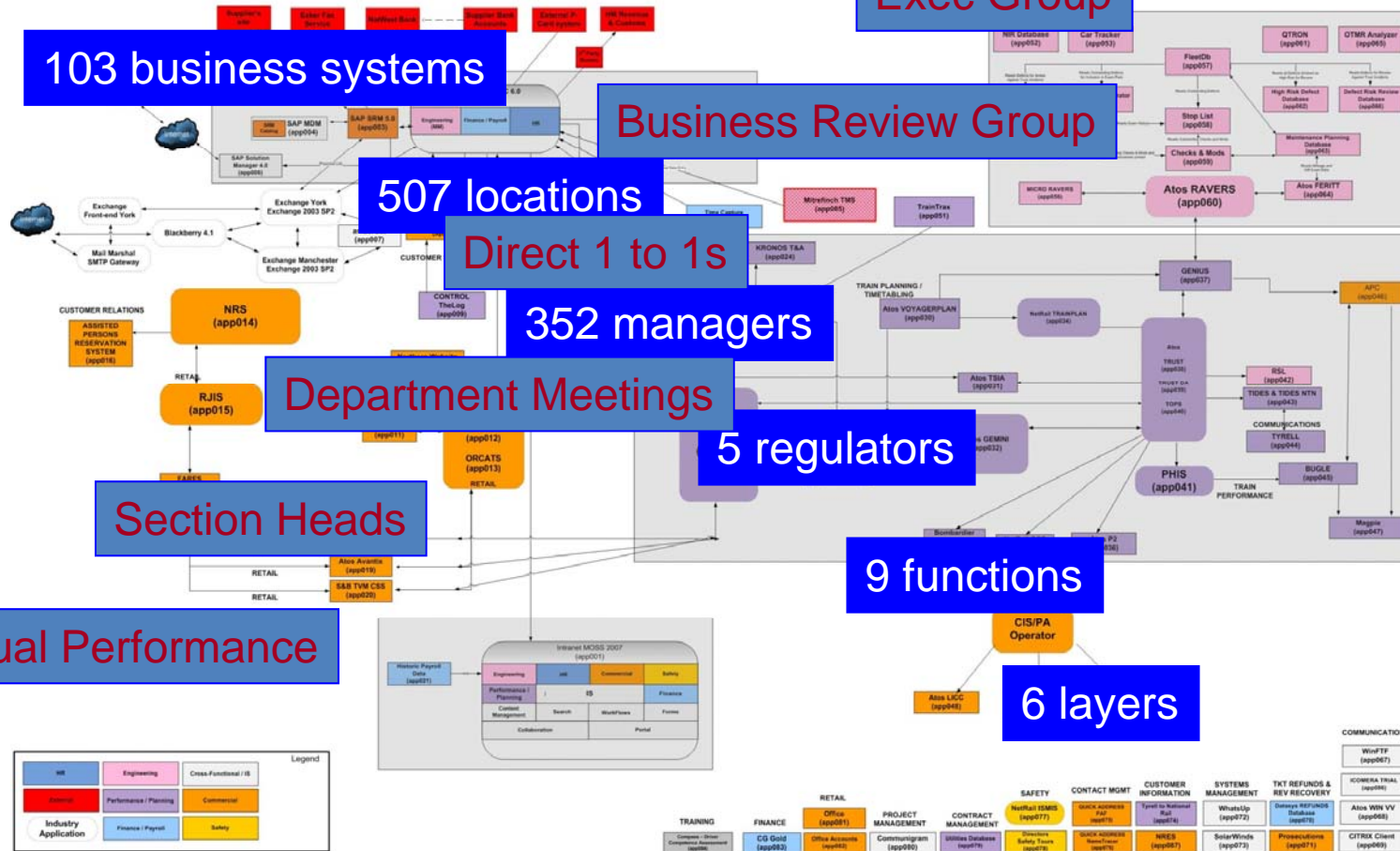
Exec Group

Business Review Group

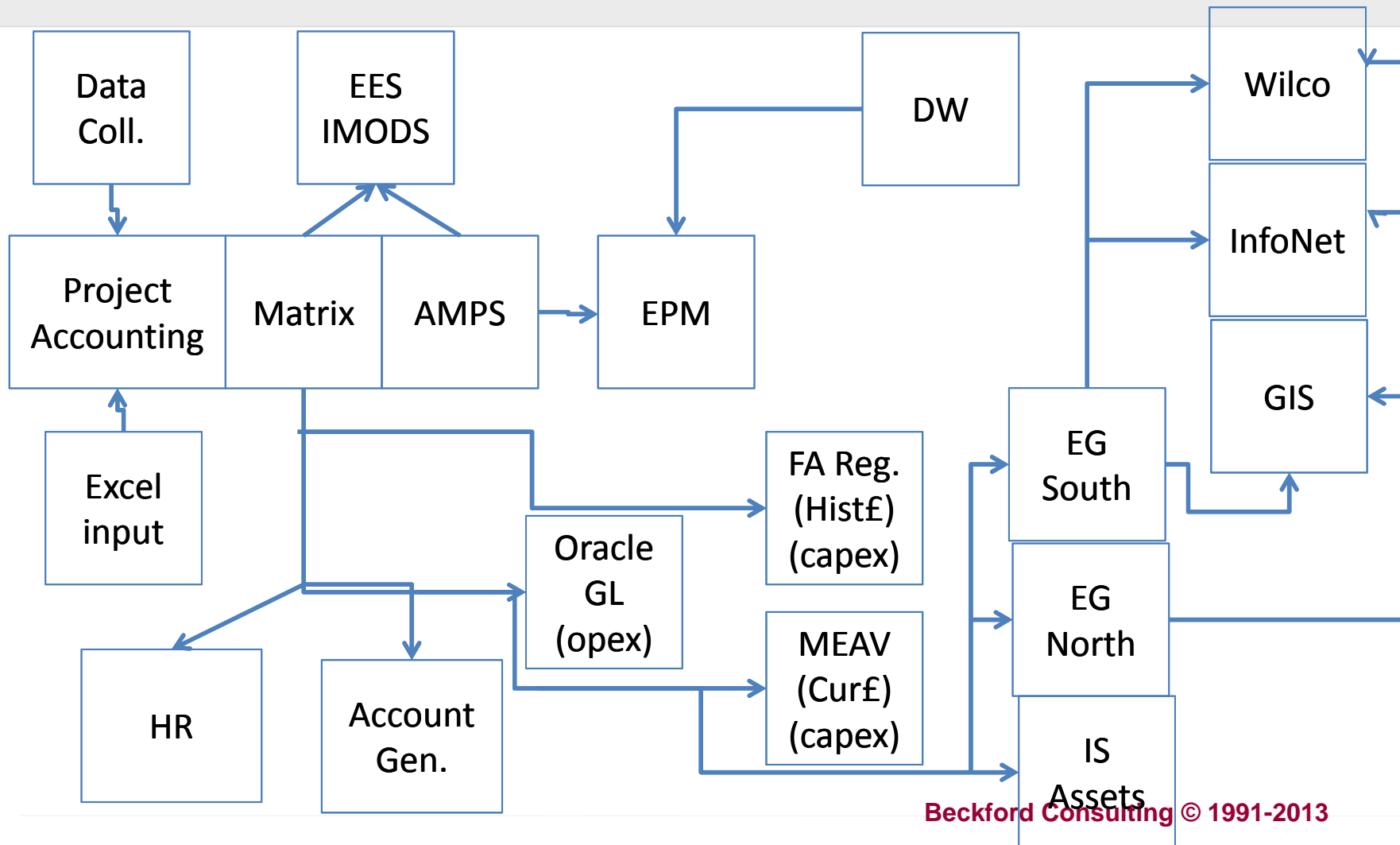
Project Reviews

9 functions

6 layers



# The Information Factory







# Beckford's Law

- Moores Law
  - processing speed doubles every 2 years
  - a driver of the growth in cheap, fast machines
  - we get a lot more bang for our buck!

- Beckford's Law
  - Data proliferates as a function of:

- Beckford's Law
  - Data proliferates as a function of:
    - the number of users

- Beckford's Law
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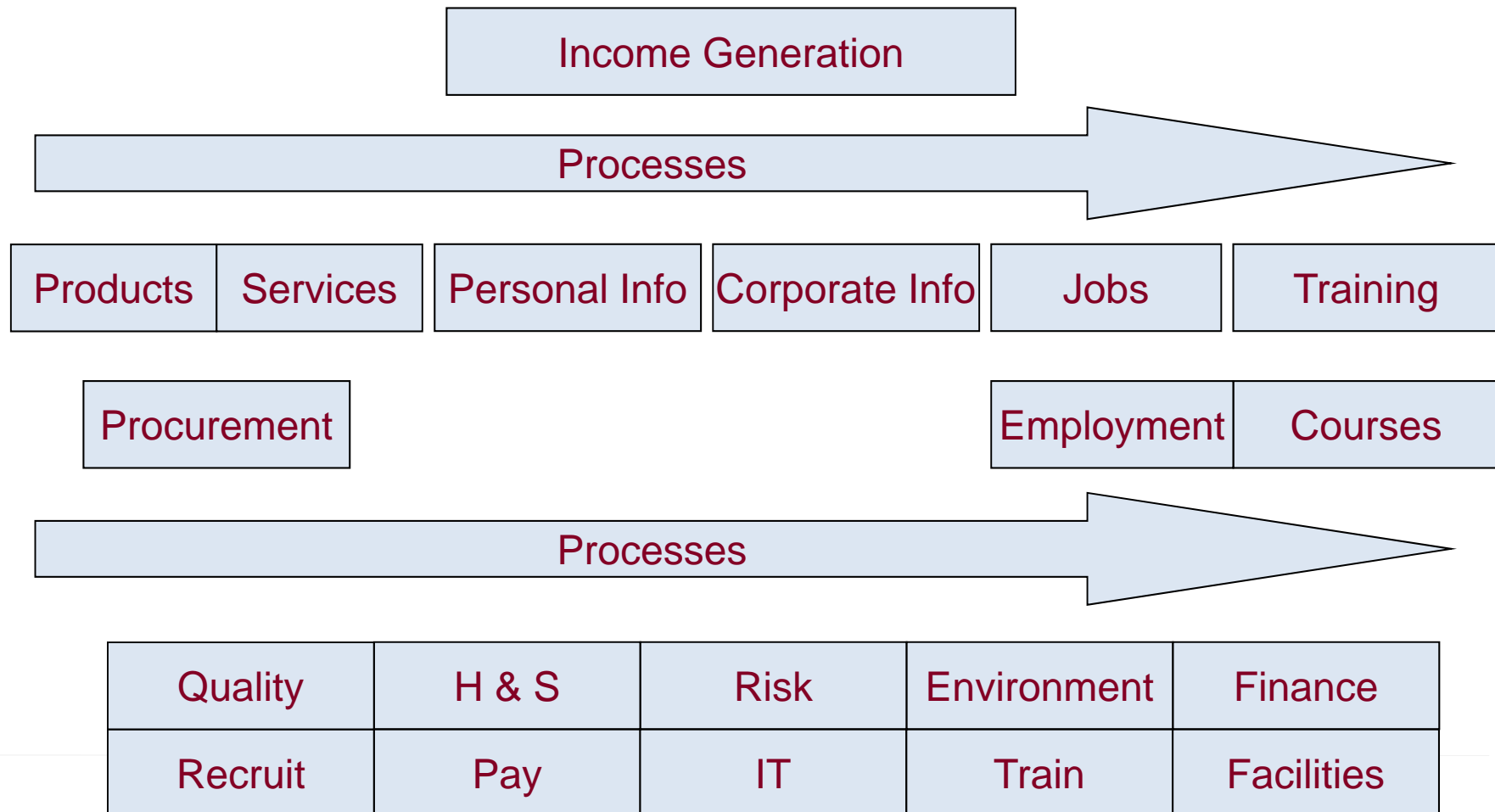
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  - Data proliferation is therefore exponential in volume and frequency
  - Information declines in proportion
  - Upshot – the more data, the less information!
-

- And, 'as evry fule kno' this:
  - Answers to the law of second law of thermodynamics
  - Reflects the notions of entropy (chaos) and negentropy (organisation):
    - Chaotic systems are higher energy/less organisation
    - Stable systems are lower energy/higher organisation
    - Data is free (unconstrained) energy – generating chaos
    - Information is constrained energy – generating order

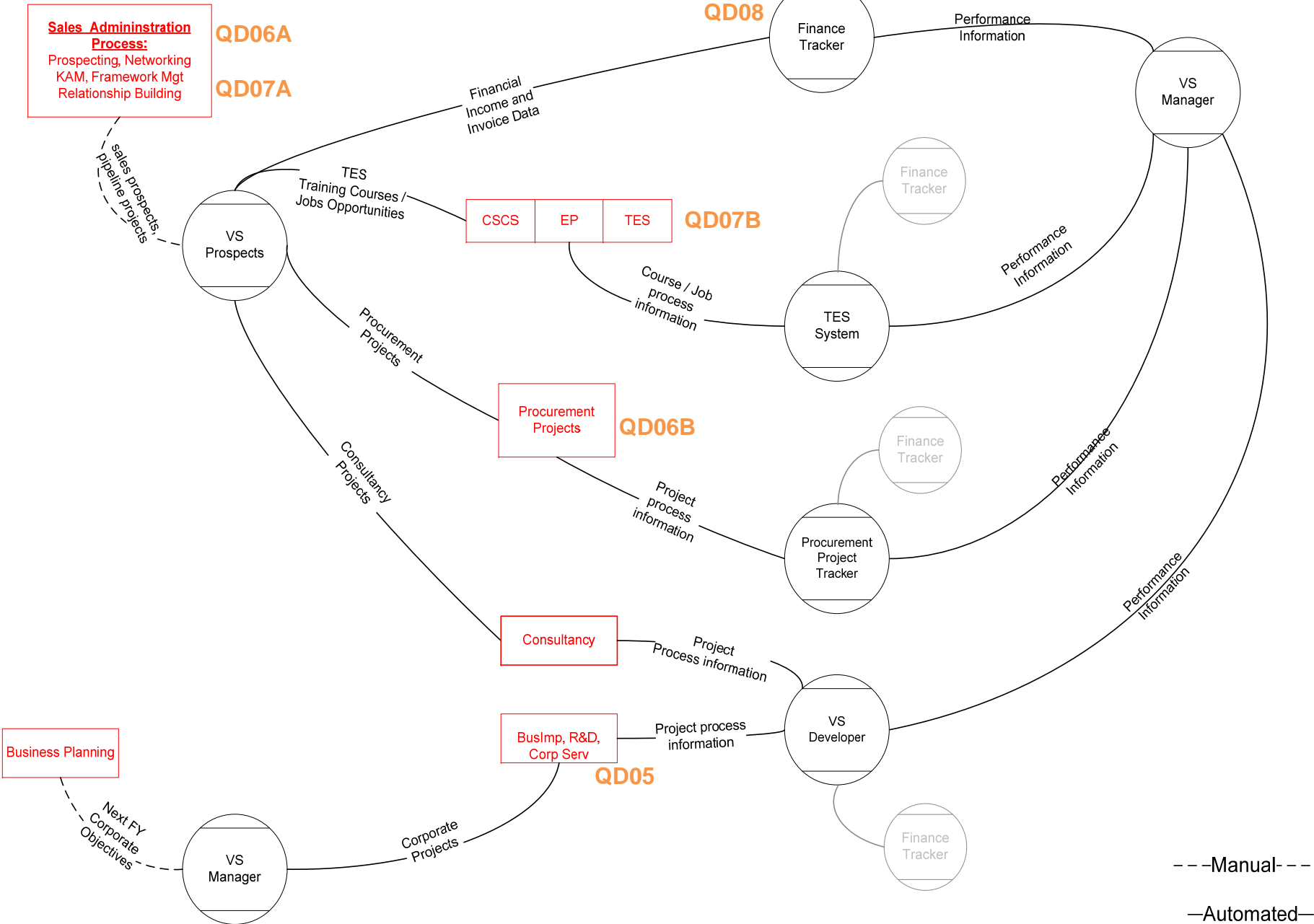
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    - Information is constrained energy – generating order
  - Order is the basis of management
  - The key to consistency, coherence, performance

# The Information Factory

- Information Systems Design – Rooted in Process Management



# The Information Factory



# The Information Factory

—Activity Data—

—Process Data—

—Core Data Flows—

—Performance Data—

—Managerial Data—

VS Manager

**Performance Outputs:**  
 Business Performance  
 Board  
 SMT  
 Unit  
 Business Streams  
 Individual

Business Planning

CRM

Finance

Marketing

Process Performance

Core Data

Finance Tracker (exists)

Core Data & vol, £££, etc

Regulatory Data

Process Level

S1

Exists  
CSCS

Exists  
EP

Exists  
TES

Convert from Excel\*  
Project Tracker

VS Dev\*\*  
Consultancy

VS Dev\*\*  
Busimp, R&D, Corp Serv

VS Prospects  
**Sales Administration Process:**  
 Prospecting, Networking  
 KAM, Framework Mgt  
 Relationship Building

Rich Data

Rich Data

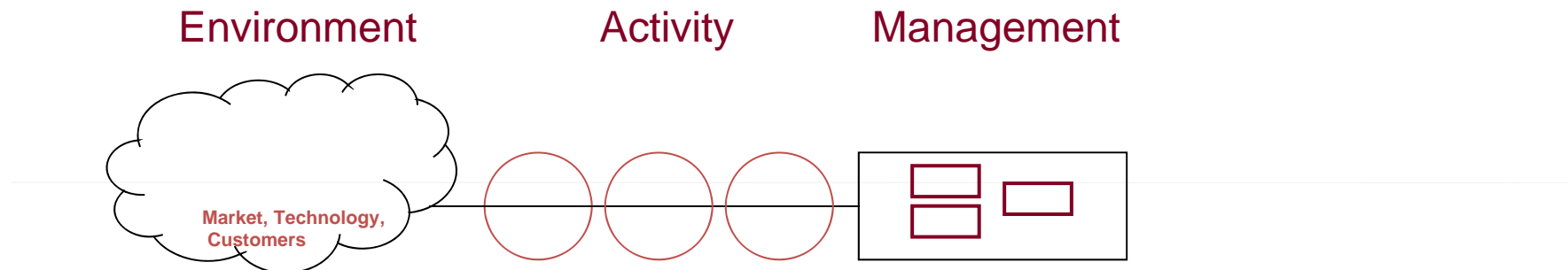
Rich Data

Rich Data

CORE DATA TABLES & APPLICATION SPECIFIC TABLES

\* Use VS Developer  
 \*\* Use VS Developer

# The Information Factory





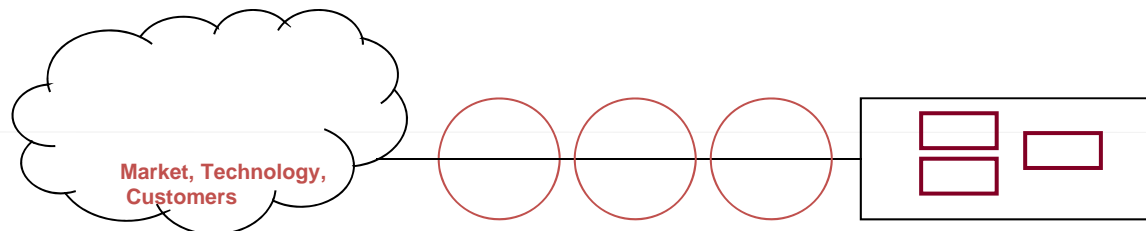
# Presentation Integration Applications Devices Network

5 Layers

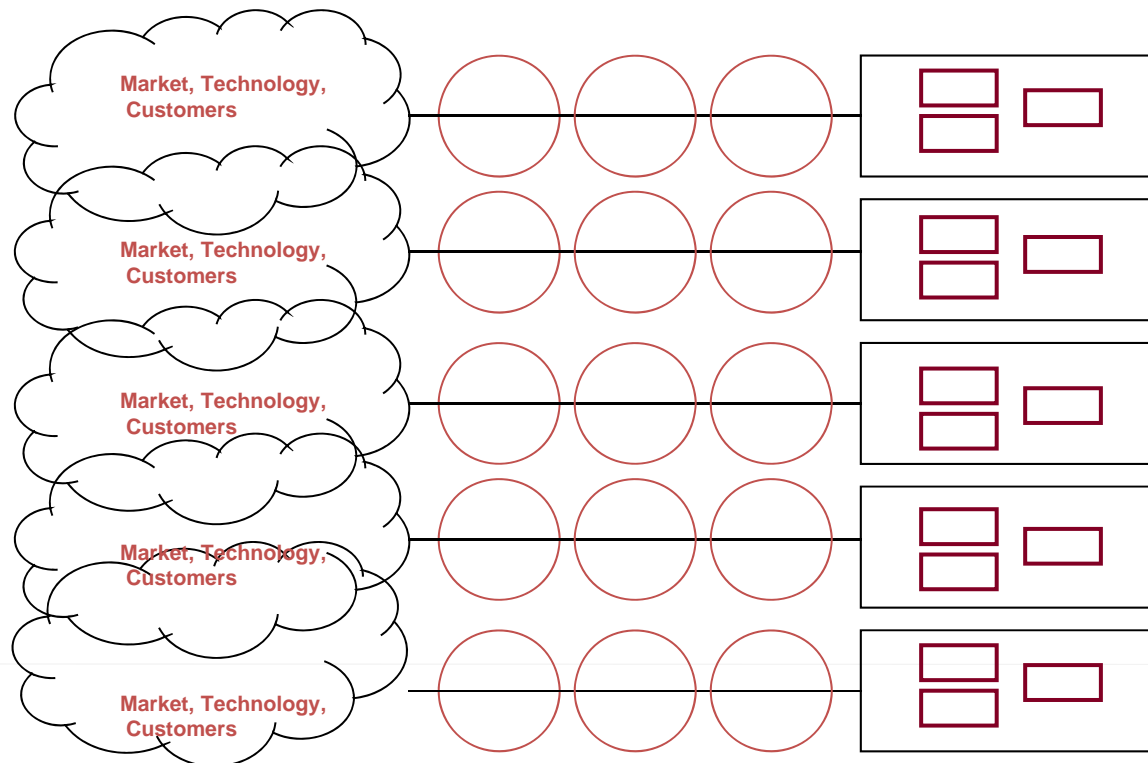
Environment

Activity

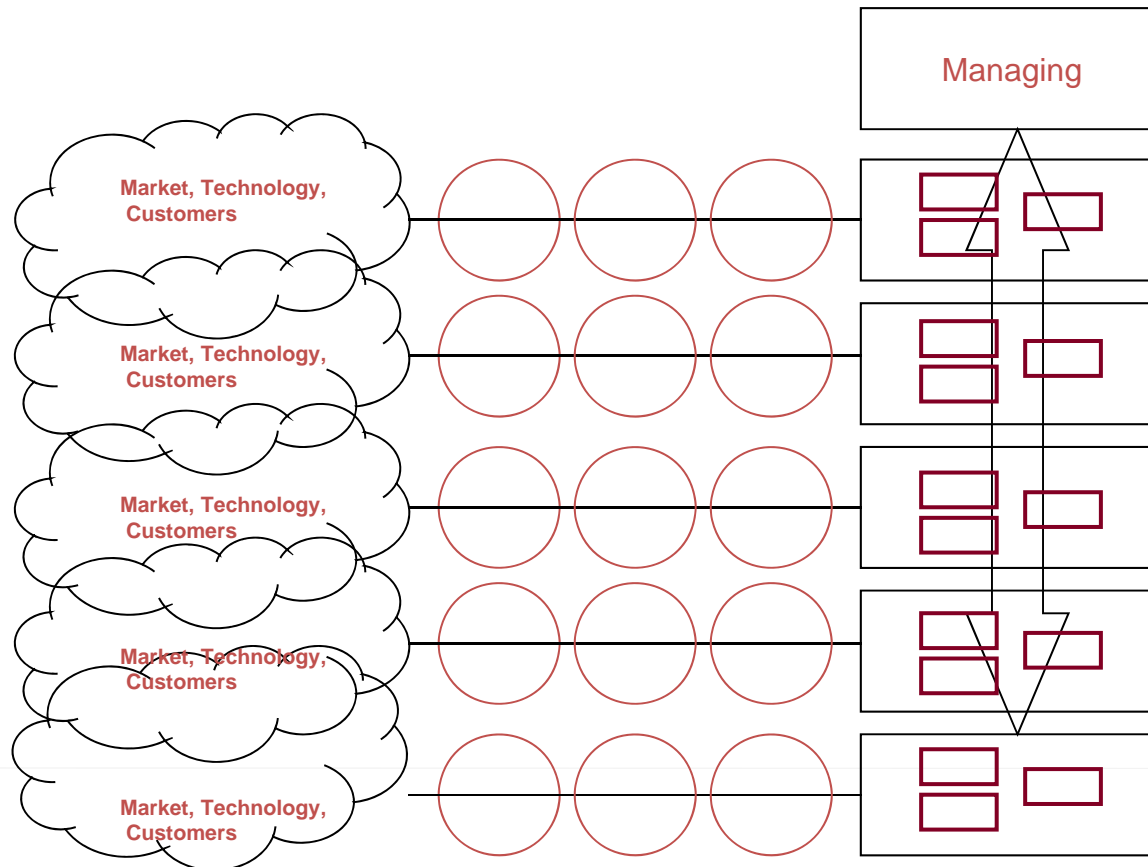
Management



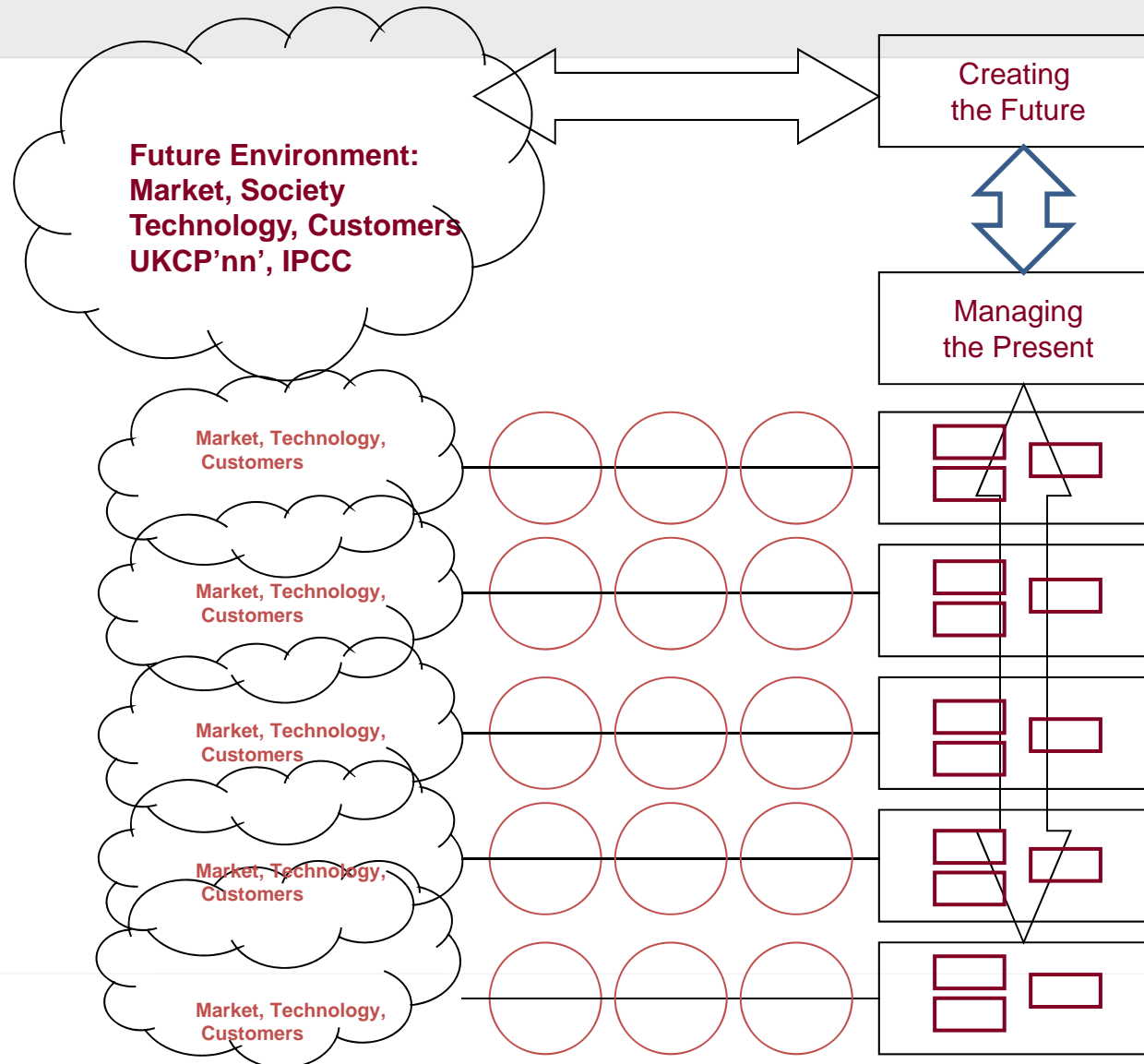
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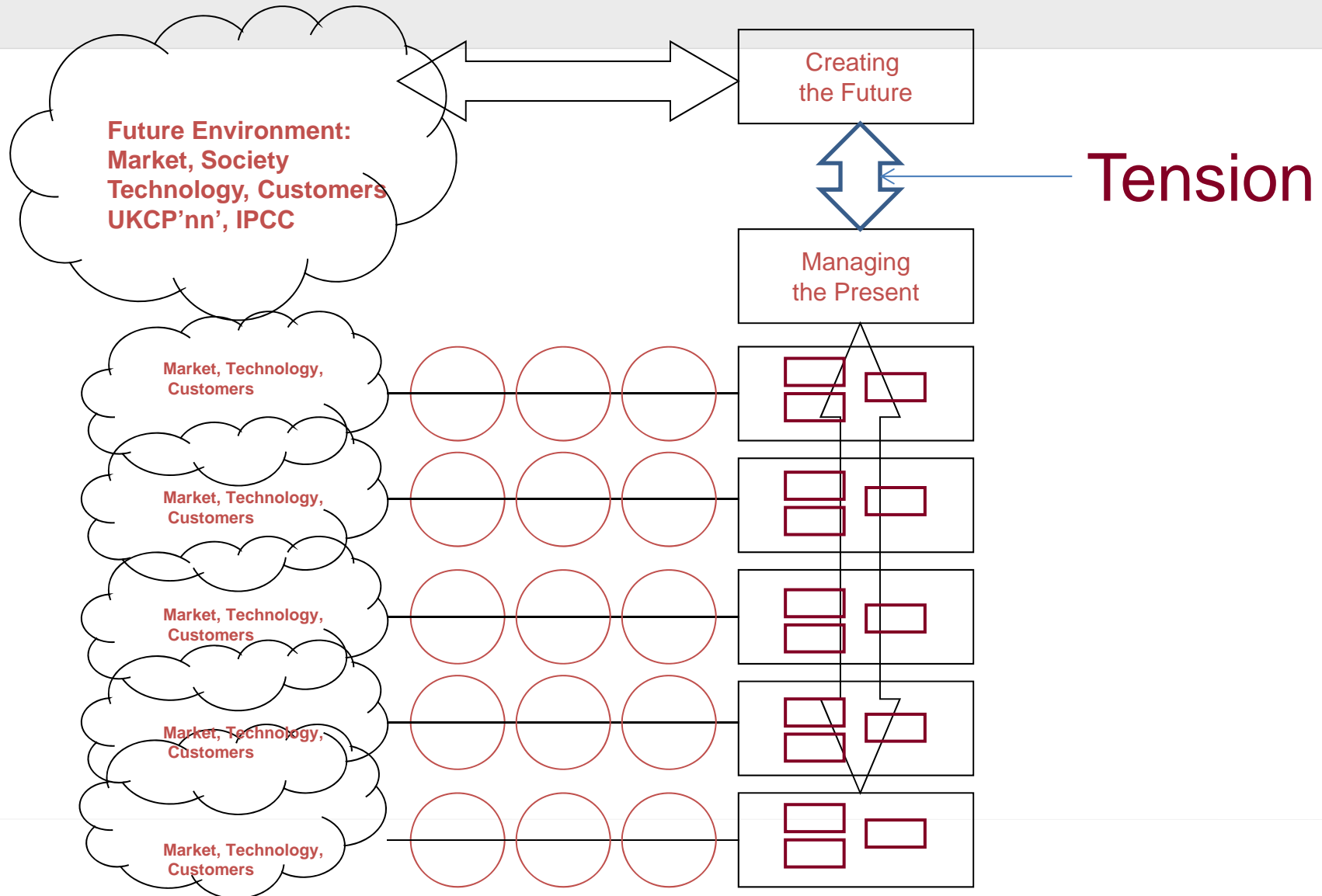
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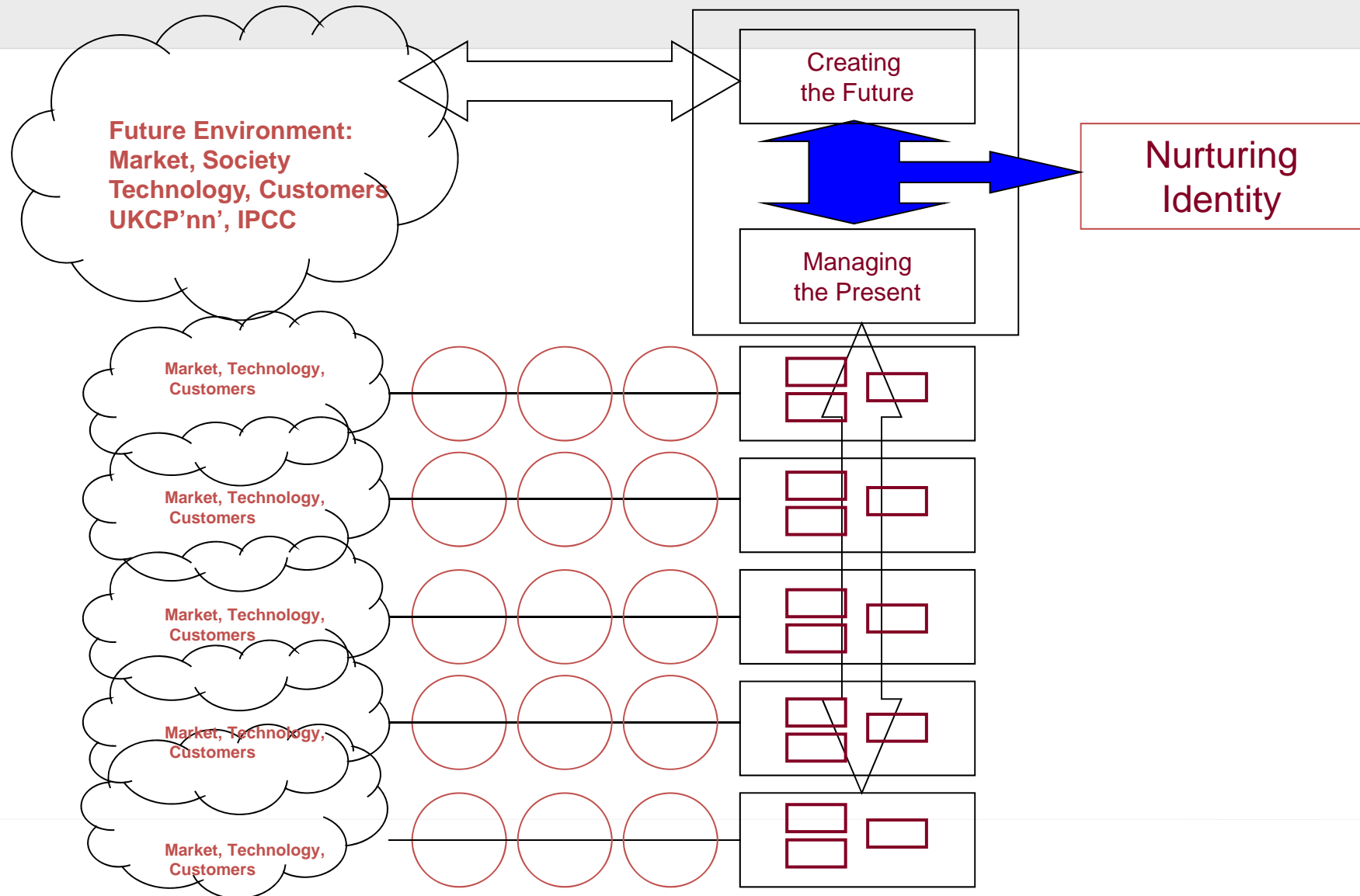
# The Information Factory



# The Information Factory



# The Information Factory



- Information lets us make decisions
- For data to become information it must be presented
  - in context
  - in relation to other relevant data
  - in comparison to 'model' data (the desired outcome) which enables a decision to be made about change or improvement
    - not improvement in the data but in the activity that generates the data

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- CEO: "I want better results"
- Information delivers:
  - the right value
  - at the right time
  - in the right format and language
  - the right decision

- Effective investment in IS requires a value proposition that:
  - offers realisable information benefit
- as an enabler of
  - realisable business benefit
- and
  - “sweats the asset”
- This requires:
  - a deep understanding of information needs
    - now and tomorrow
  - intelligent exploitation of existing systems

- Effective investment in IS can, in many cases, be derived from effective exploitation of existing systems:
  - the 'data' is already there
  - we are just not asking the right questions

- Effective investment in IS can, in many cases, be derived from effective exploitation of existing systems:
  - the 'data' is already there
  - we are just not asking the right questions
- Contention:
  - there is significant benefit to be obtained by many organisations from existing systems
  - there is more value in realising that benefit than from investing in new systems (and more data!)
  - the IS department won't like it!

- So what SHOULD we do?
  - Develop an Information Strategy rooted in:
    - Understanding the information needs of the business
    - Understanding the value to be obtained from it
    - Commission Information Projects
    - ‘Sweat the asset’ – work the IS as hard as we work other capital assets (most computers do only a small fraction of the work of which they are capable)
    - When the pips are squeaking....
    - Invest against ‘Return on Information Investment’
      - Measure the information benefit against the cost of provision

Understand the information  
needed to manage the business

Business Effectiveness

## Investing in Information

Understand the information  
needed to manage the business

Business Effectiveness

Understand the value to the business  
of having that information

Business Financial Performance

Understand the information  
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Business Effectiveness

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Business Financial Performance

Develop an Information Strategy



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Determine what hardware and  
systems are needed

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Commission Information Projects

Measure  
the  
Information  
Payback

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Business Effectiveness

Understand the value to the business  
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Business Financial Performance

Develop an Information Strategy

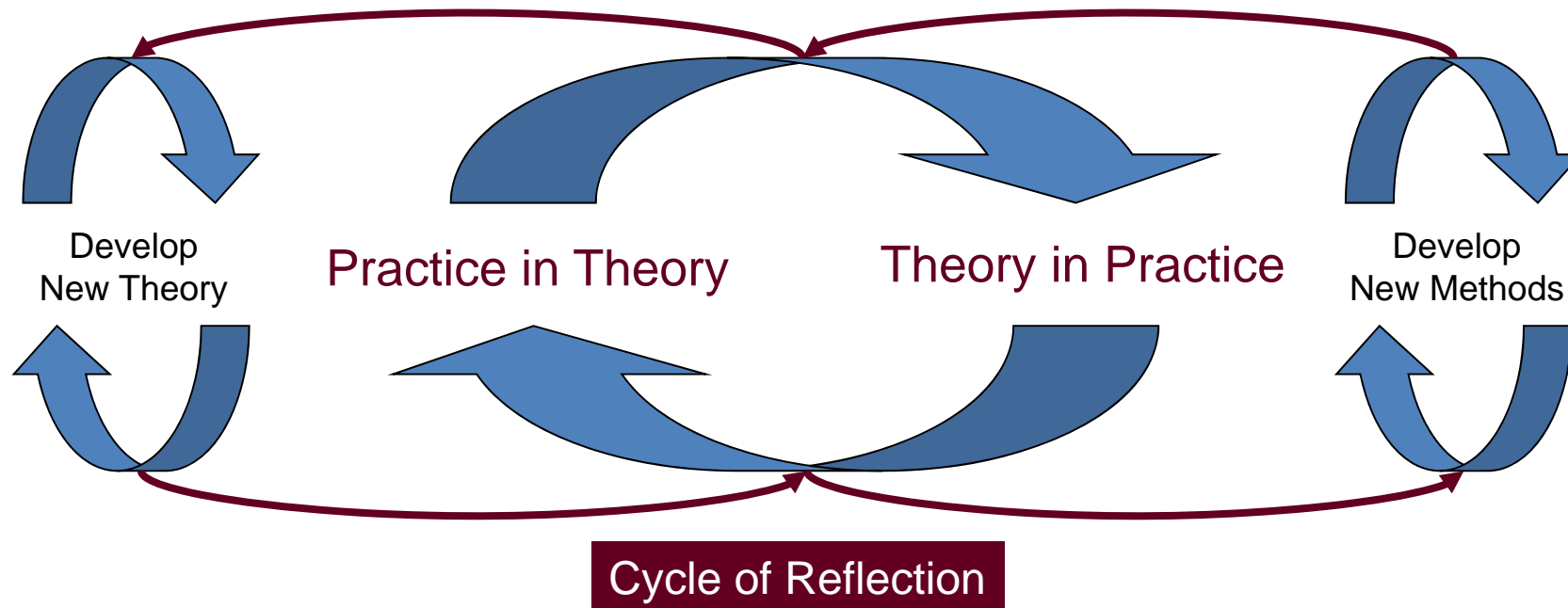
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Commission Information Projects

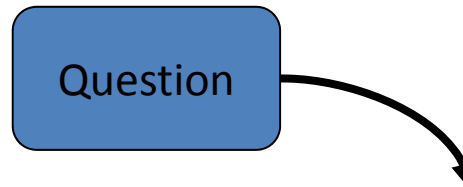
Measure  
the  
Information  
Payback

Measure  
the  
Value  
Added

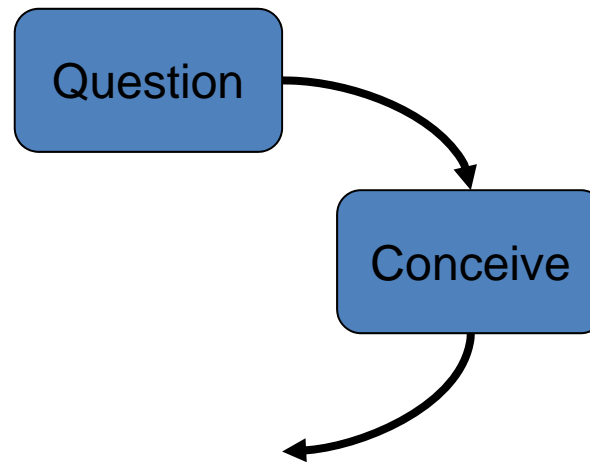
Continuous adaptation!



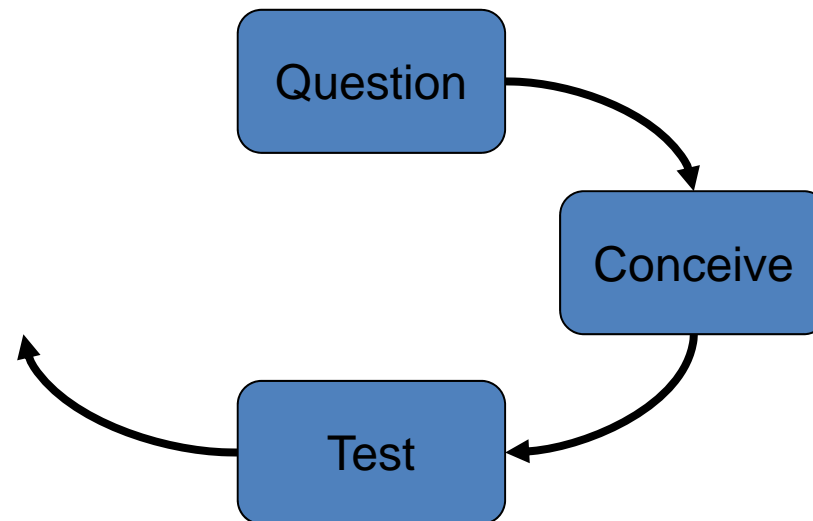
- A Learning Cycle:



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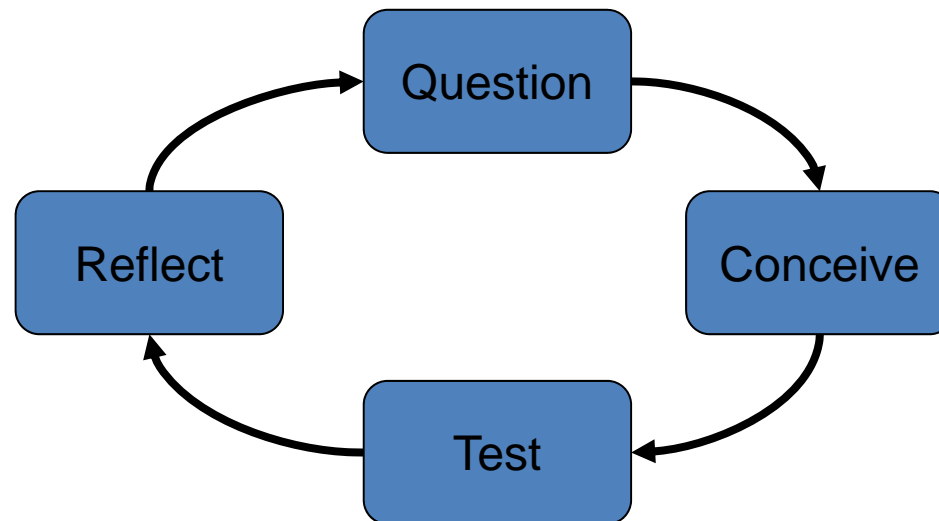


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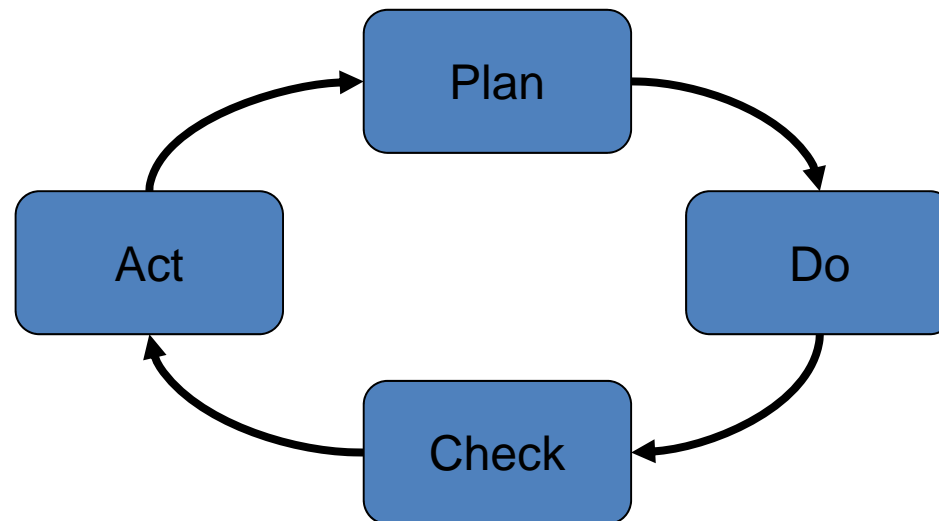




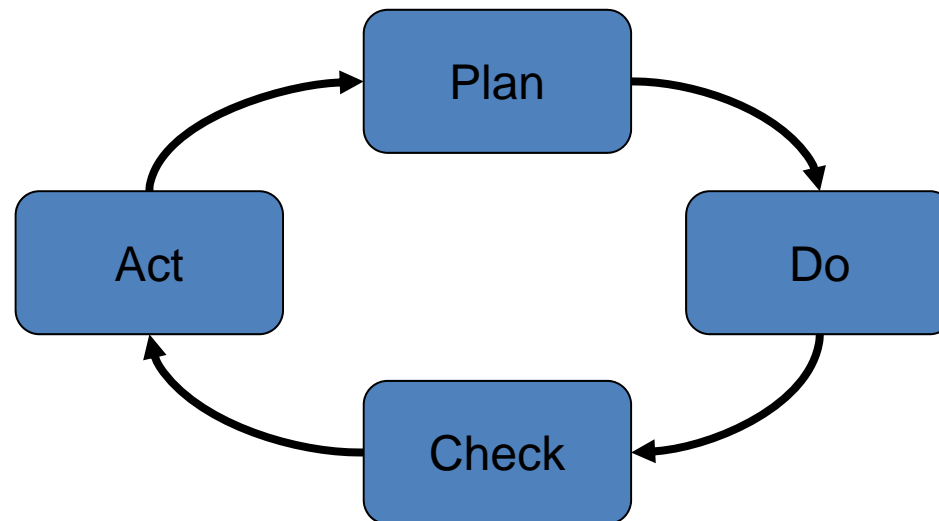
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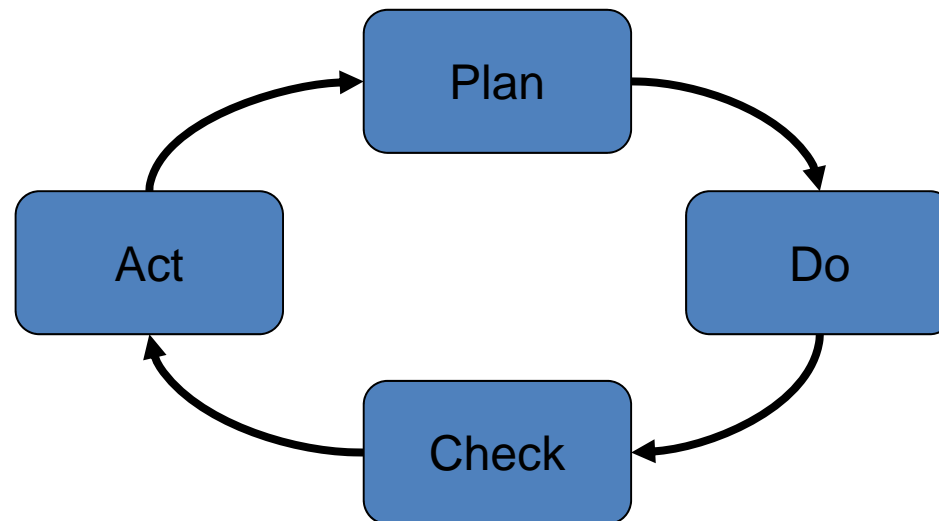


- A Learning Cycle:



What has changed?

- A Learning Cycle:

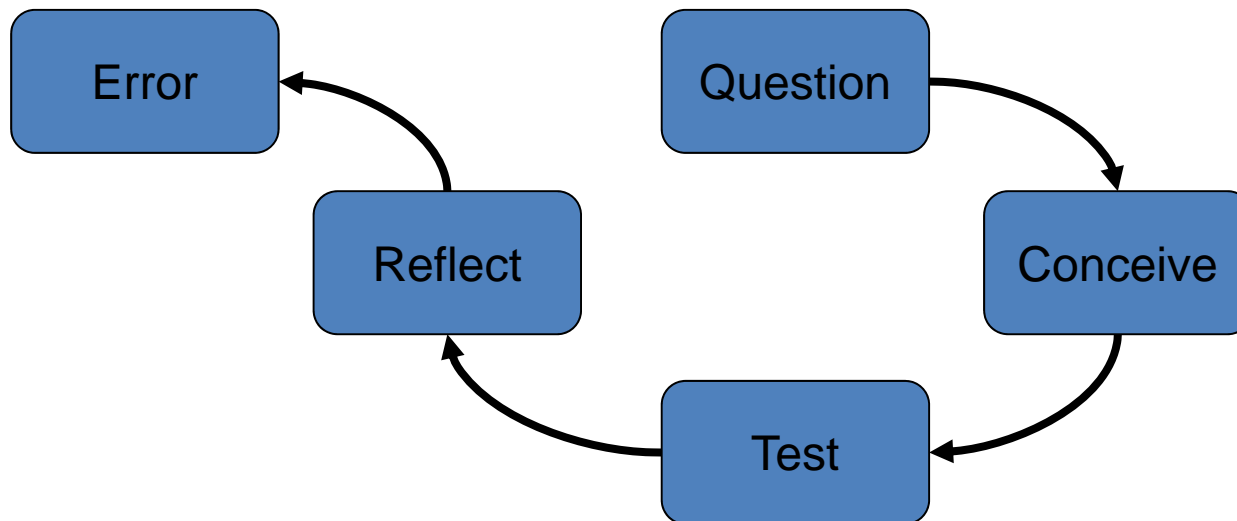


- What has changed is knowledge!

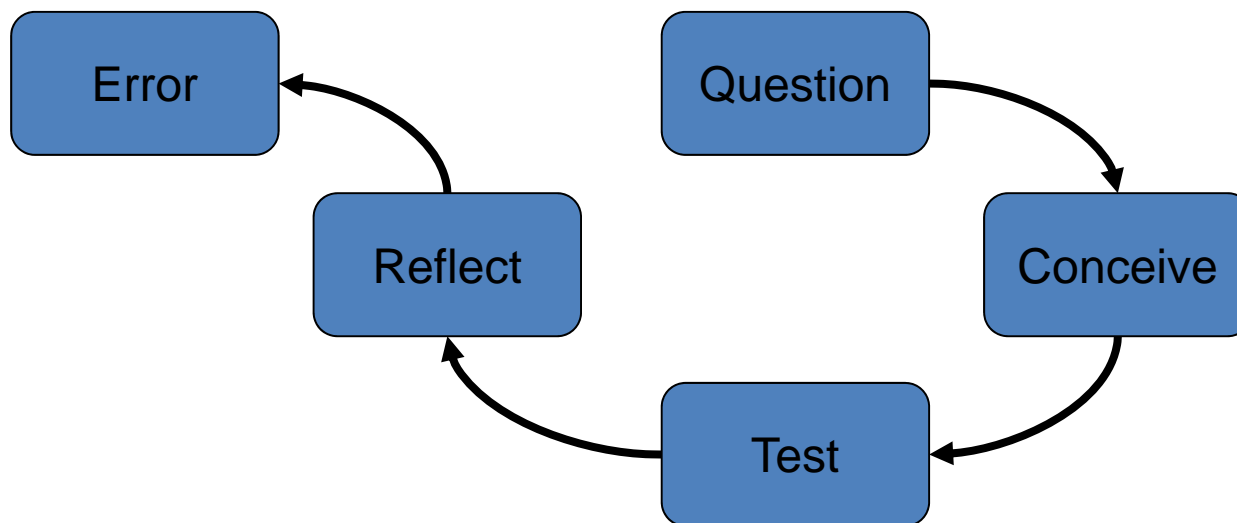
# Information for Adaptation

- What has changed is knowledge!
- New knowledge enables new decisions

- Learning fails when “Information Loops” are left open

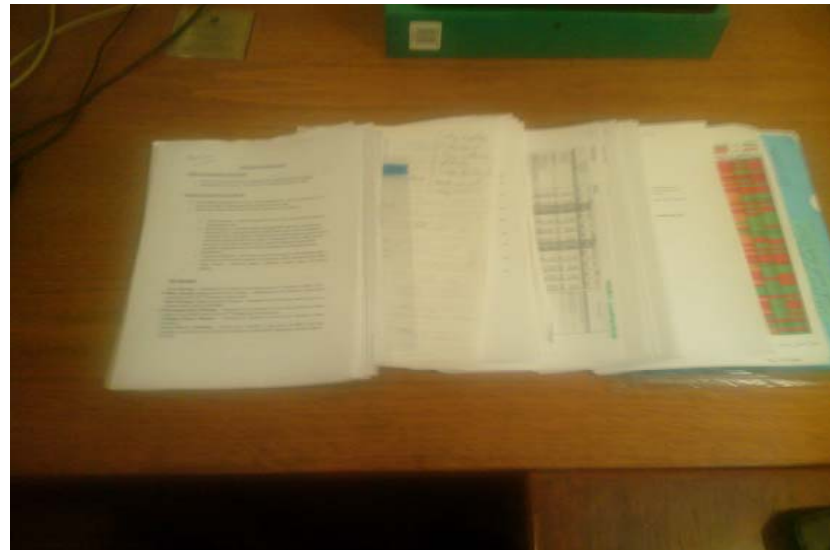


- Open loops (lack of closure) mean that nothing is decided – so nothing changes!



# Information for Adaptation

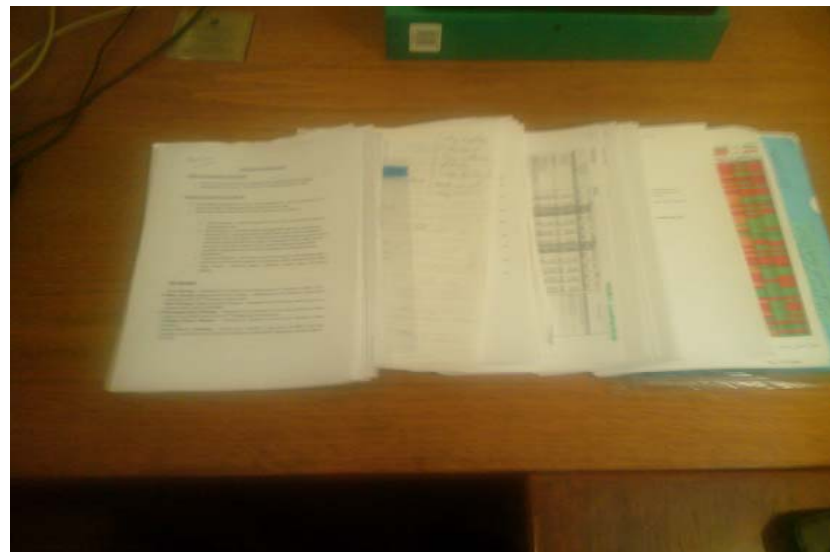
- So, how do we carry out this ‘exchange of data’?
- Typically by producing a report (or several!)





# Information for Adaptation

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One week's worth  
for one Director

# Information for Adaptation

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The Month!



# Information for Adaptation

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# Information for Adaptation

- So, how do we carry out this ‘exchange of data’?
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# Information for Adaptation

- So, how do we carry out this ‘exchange of data’?
- Typically by producing a report (or several!)
- Typically we are overwhelmed with data – but have little information!

“Reports and procedures should be kept to a minimum and only used when they save time and labour. They should be as simple as possible!”

Peter Drucker, *The Practice of Management*, 1955

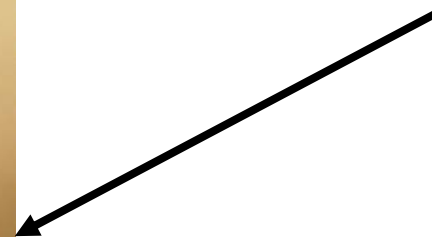
# Information for Adaptation

- “..... kept to a minimum.....”

- “..... kept to a minimum.....”



Hmmmmm!



# Information for Adaptation

- What is a report?



- What is a report?
  - An explanation of why what was planned didn't happen
  - Written by someone who wasn't there
  - Addressing a question they didn't understand
  - Sent to a recipient who didn't ask the question
  - Presented to an audience that doesn't care
  - Asking for a decision that doesn't matter because its too late to affect the outcome of the next cycle

# Information for Adaptation

- The essence of communication may rest in having something to say!
  - A story to tell
  - A message to convey
  - A concern to share
  - A decision to get made

So, why are we so bad at it?

- The essence of communication may rest in having something to say!
- Why are we so bad at it?
  - We have too much data to assimilate adequately
  - We don't know what the message is
  - We are too concerned with 'what they want to hear'
  - We are not confident in our message
  - We have data, we NEED information

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  - We have data, we NEED information
    - Information is aggregated data that has meaning
    - Meaning is relative - direct (internal) or contextual (external)

# Information for Adaptation

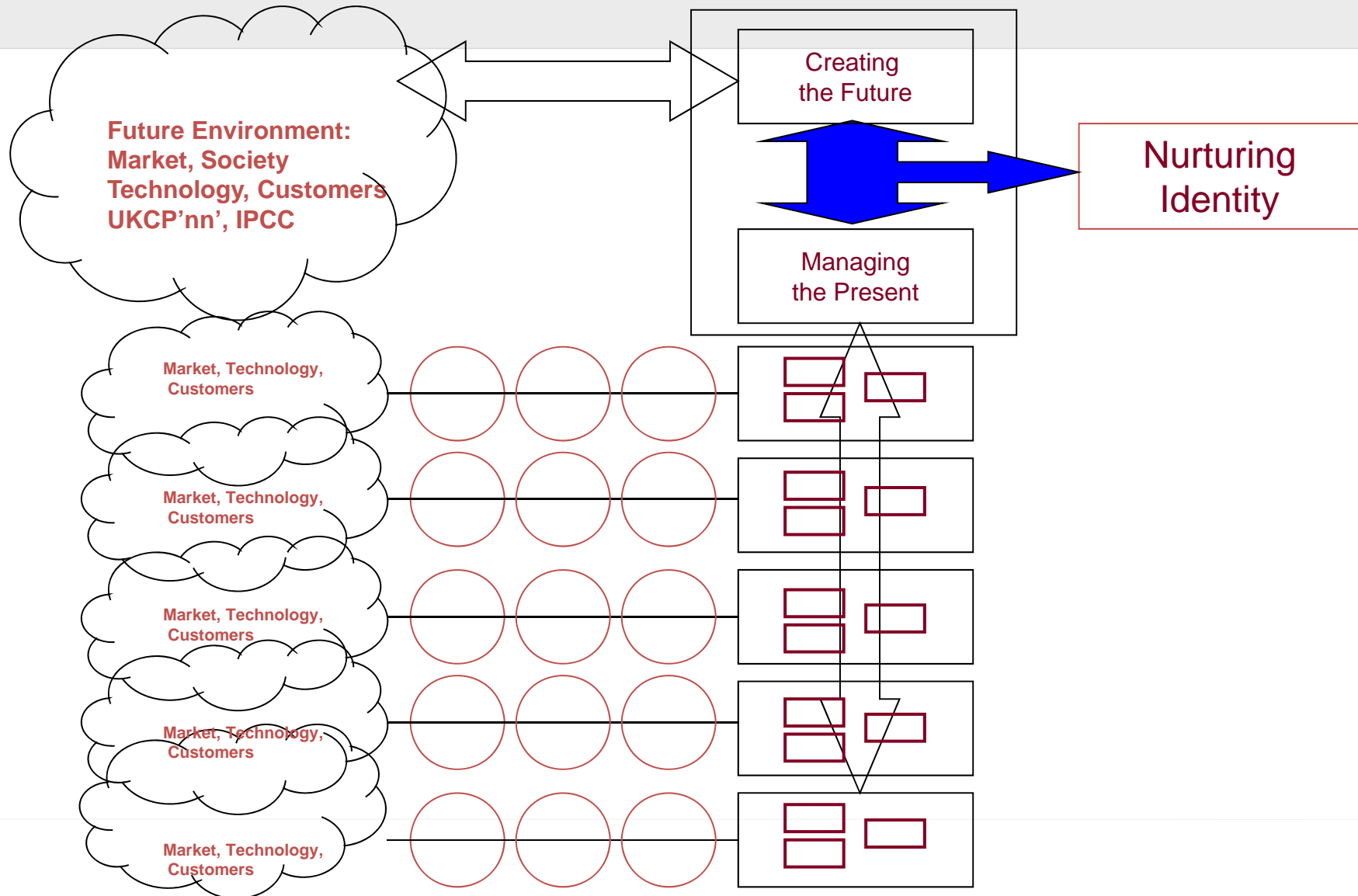
- The essence of communication may rest in having something to say!
- Why are we so bad at it?

If you think IT is the solution to your problems,  
then you don't understand IT

and you don't understand your problem either!

Joseph Rowntree Reform Trust, March 2009

# The Information Factory



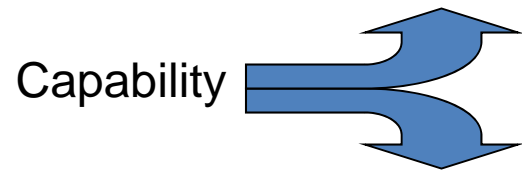


# Information for Performance Management

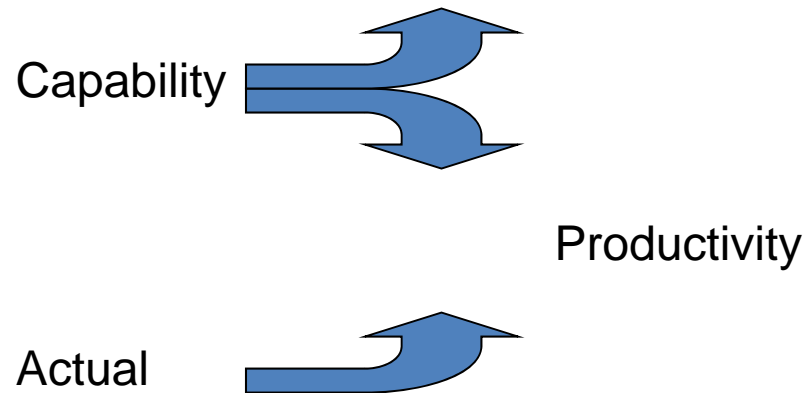
- The potentiometer
    - A device for measuring viability
    - For comparing apples with pears
    - For financial AND non-financial measures of performance
    - For understanding effectiveness
    - For aligning the organisation around fulfilment of its purpose
-



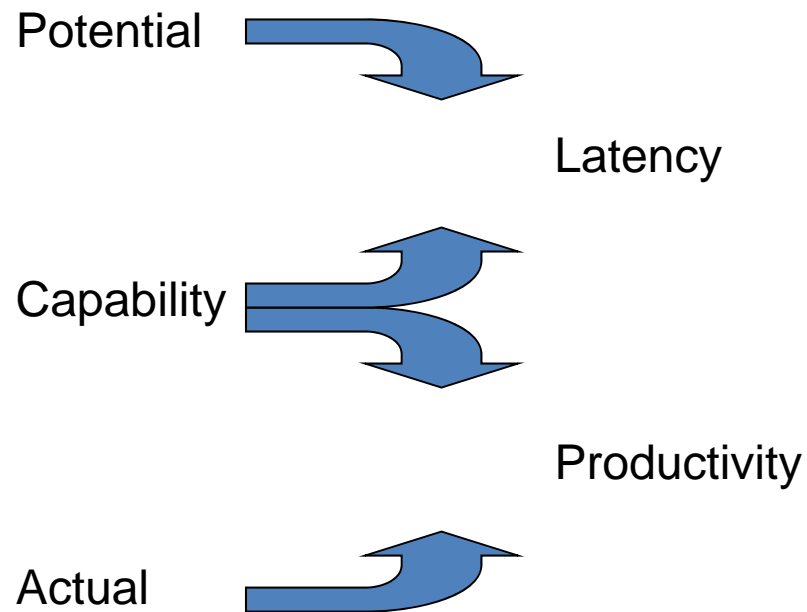
# Information for Performance Management



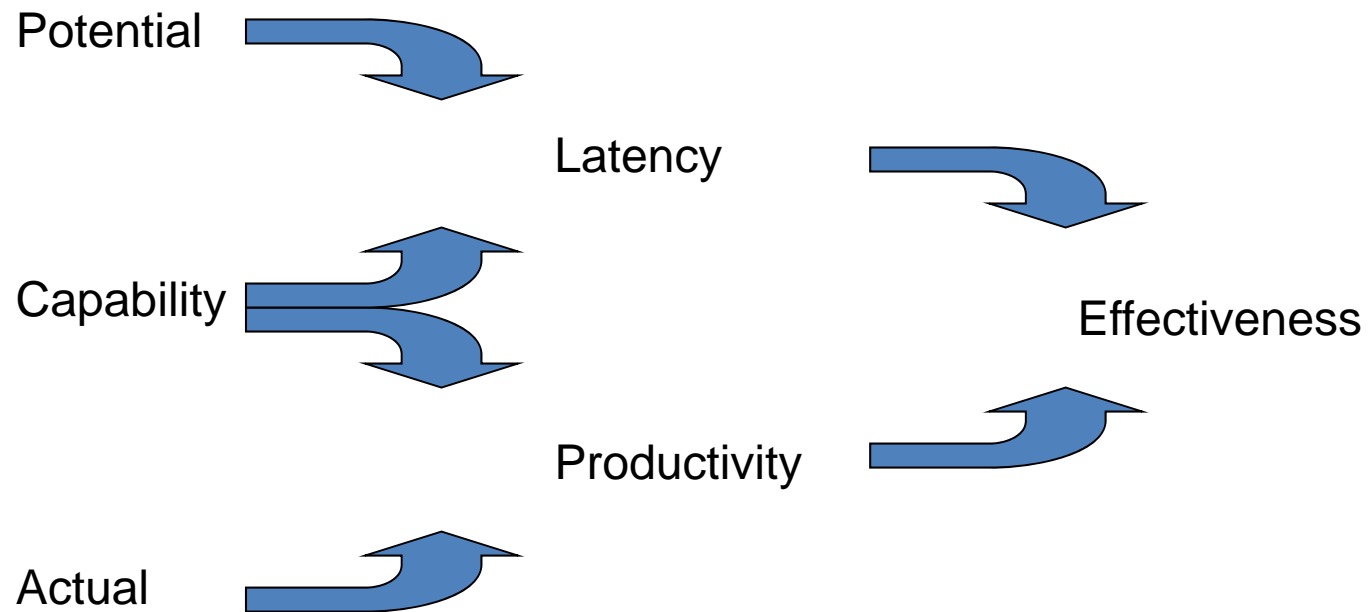
# Information for Performance Management



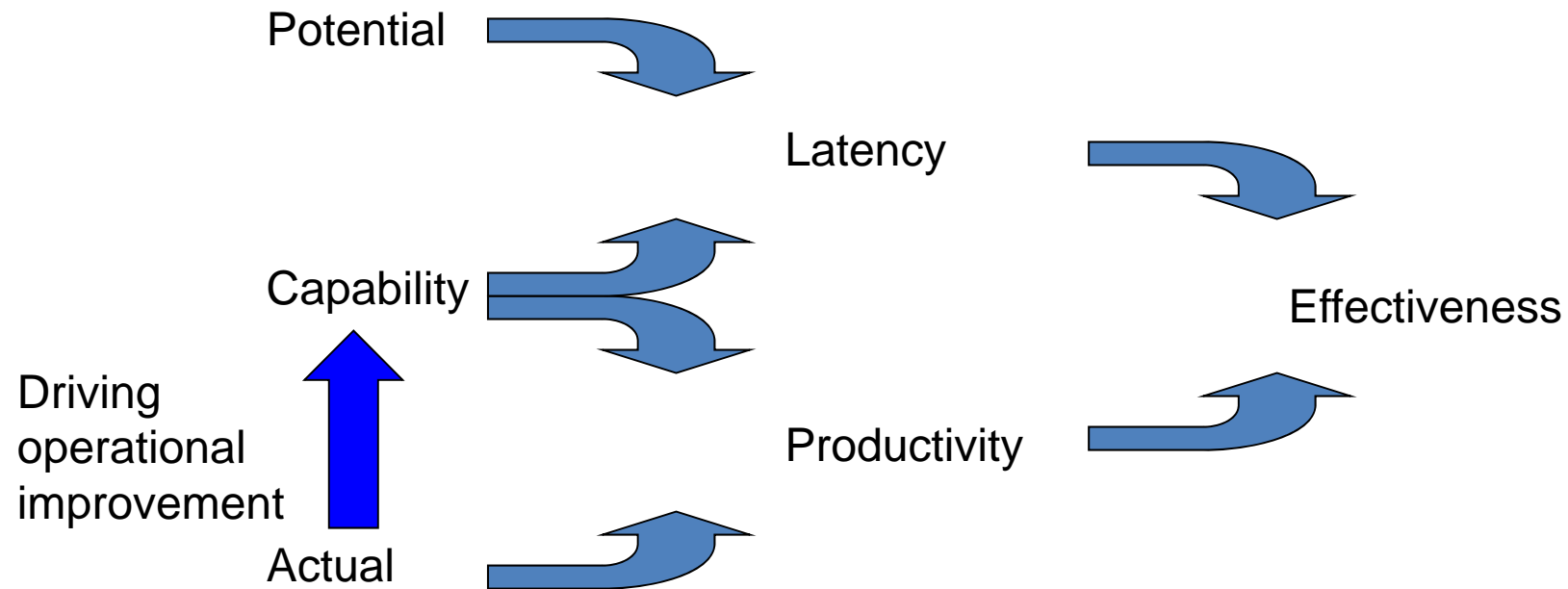
# Information for Performance Management



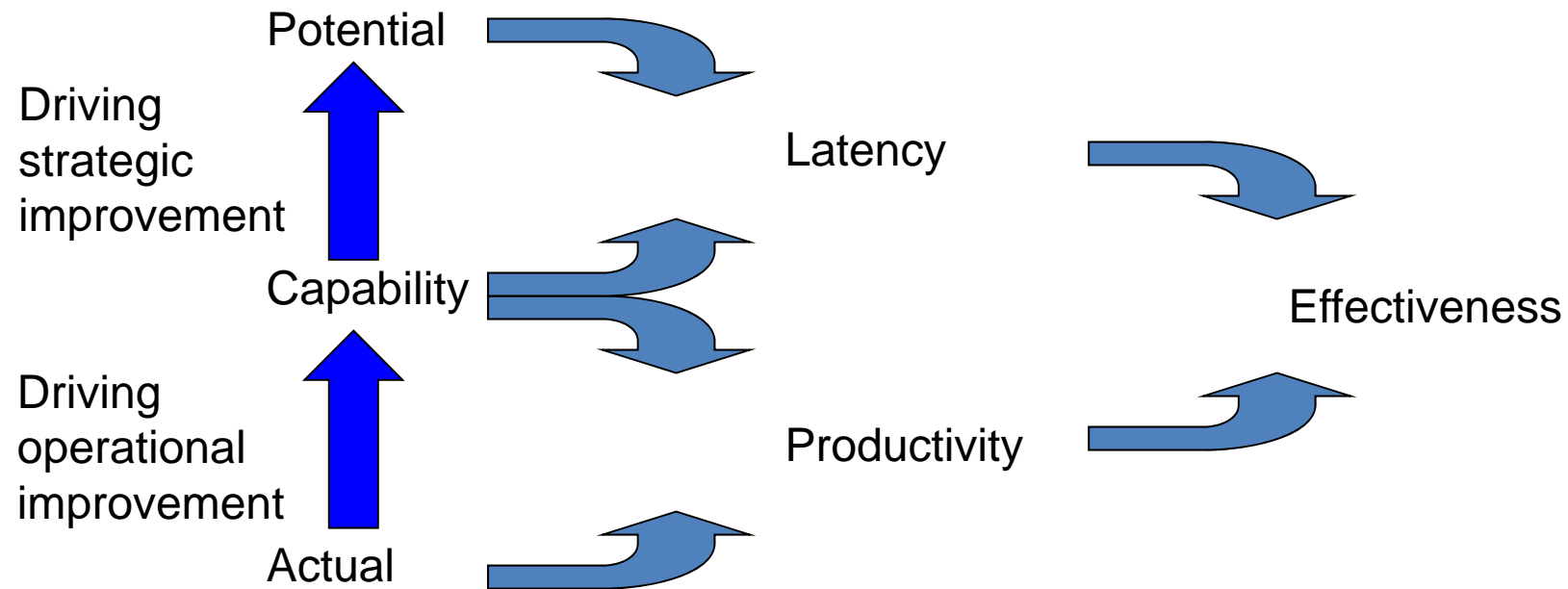
# Information for Performance Management



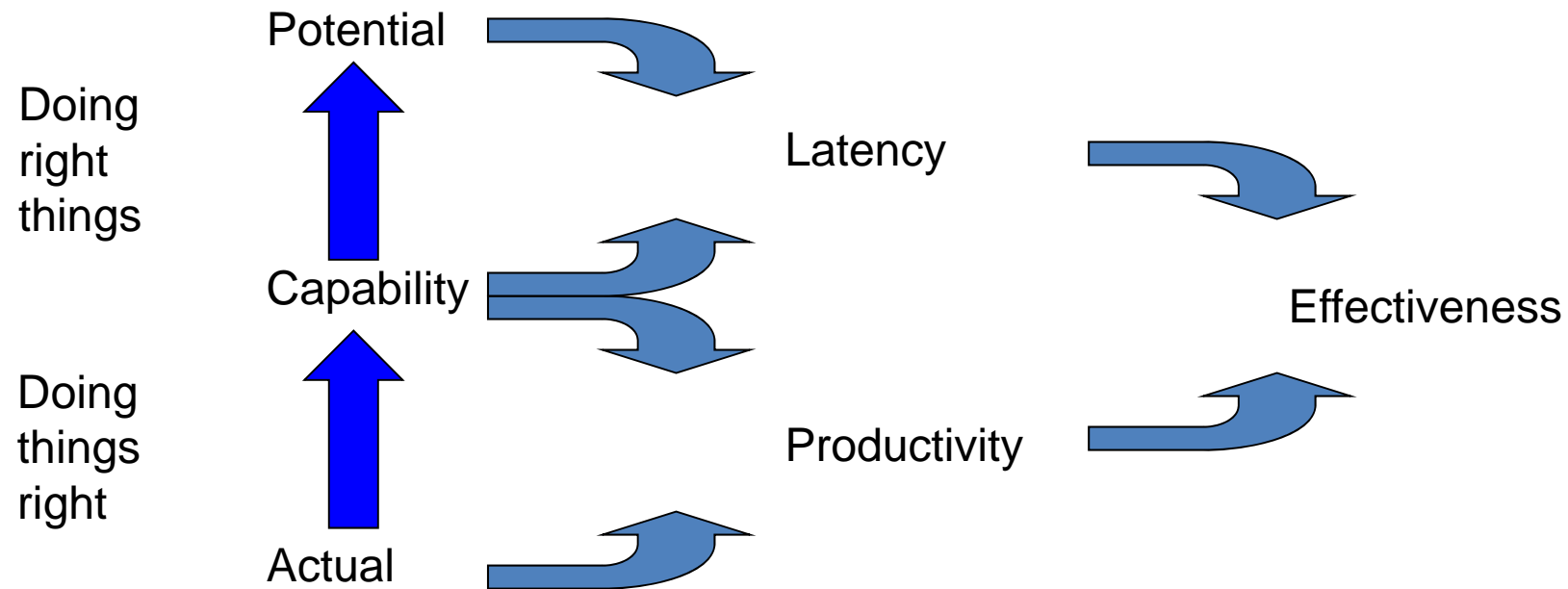
# Information for Performance Management



# Information for Performance Management



# Information for Performance Management



# The Information Organisation

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Professor John Beckford  
Manchester Business School  
23<sup>rd</sup> October 2013