Key Performance Indicators

Measurable Facts to Tune Execution of the Business Plan

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Requirements of Standards

Teaching Goals

Intuitive Introduction

Operational Definition

- Defining generic KPI's
- The PDCA-cycle
- The Learning Organization
- The political arena
- Reinforcing desired outcome
- Working with people
- Nuts and Bolds

Summary

Cited from ISO 15189:2007

4.12.4 Laboratory management shall implement quality **indicators** for **systematically monitoring and evaluating** the laboratory's contribution to patient care.
When this program identifies opportunities for improvement, laboratory management shall address them regardless of where they occur.
Laboratory management shall ensure that the medical laboratory participates in quality improvement activities that deal with **relevant areas and outcomes of patient care**.

4.1.6 Laboratory management shall ensure that proper communication processes are established within the laboratory and that **communication** takes place **regarding the effectiveness** of the quality management system.

Cited from JCI

QPS.3.2 Clinical monitoring includes those aspects of laboratory services selected by the leaders.

…

Clinical monitoring data are used to study areas targeted for improvement.

KPI
Definition

1. Indicators for
systematically monitoring and evaluating
the laboratory's contribution
in improving relevant areas and outcomes of patient care.

2. Proper communication within the laboratory
regarding the effectiveness of the system.

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Summary

Pre-Test

1. The introduction of KPI's is important

- ☐ for compliance with ISO-15189 and other standards
- ☐ for policing the laboratory

2. The introduction of KPI's results in

- ☐ increased motivation of employee's
- ☐ improved performance
- ☐ a net benefit over overhead investment in KPI's
- ☐ all of the above
- ☐ none of the above who secretly thought this ?

The validity of the concept is questioned.
KPI's are seen as an instrument of repression / coercion.
Why this negative premonition ?

Pre-Test

3. To setup KPI's

- ☐ define new statistics
- ☐ use existing statistics
- ☐ make statistics available for the management review
- ☐ post statistics periodically
- ☐ post statistics publicly

Teaching goal:

By understanding the answer to the above questions,

to understand

- how to select (& validate) **KPI's**

- how to go about their implementation

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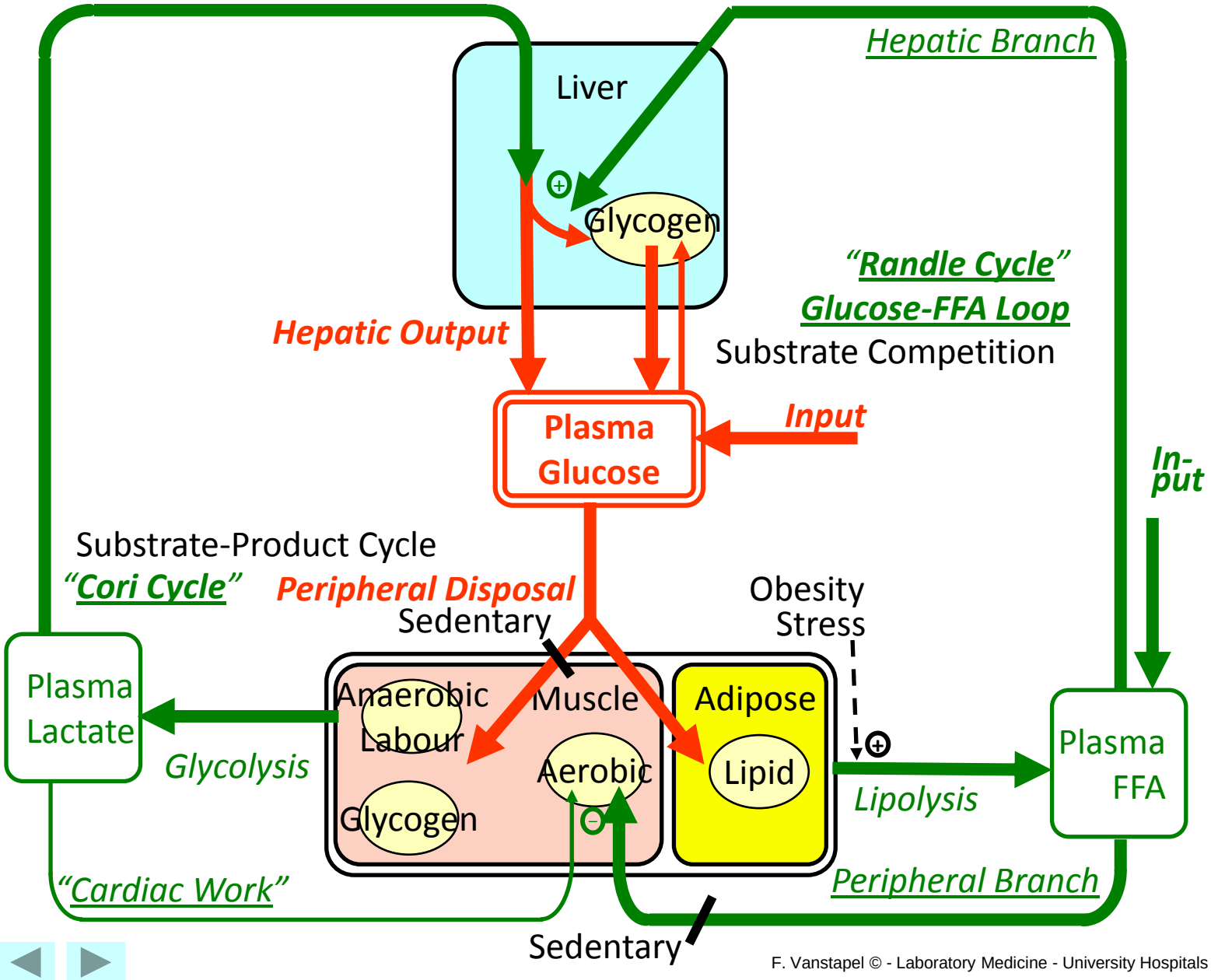
Summary

Life
= Open Systems maintaining Steady States
= Physiology of Permanence

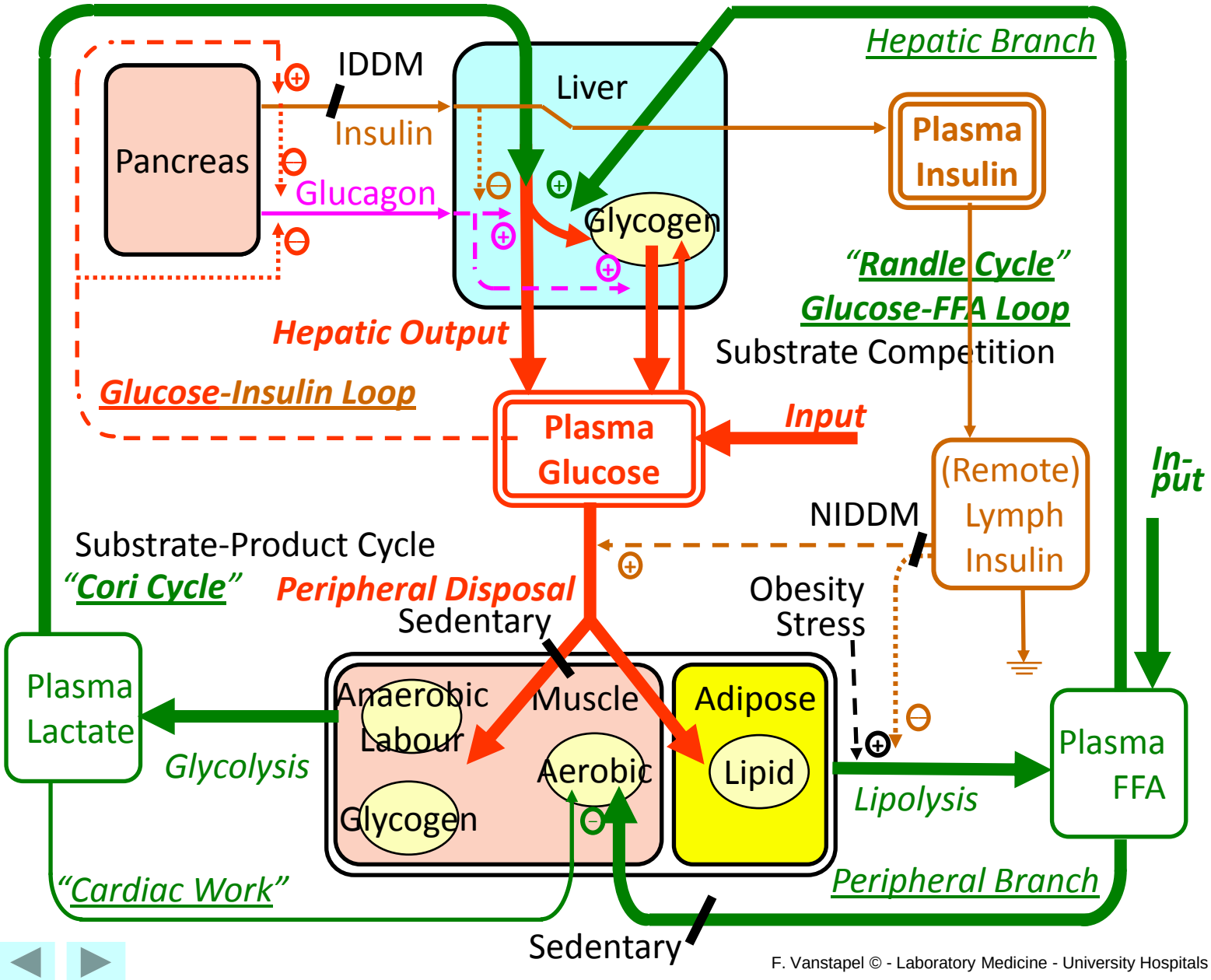
Biology is the prime example of the Science of Cybernetics

(Norbert Wiener, Ross Ashby)

The glucose loop



The insulin-glucose loop



Summary 1/2

Physiology:
The glucose-insulin axis works (feedback cycle) because:

- There is an underlying metabolic machinery at work
- That system has its own characteristic set-point
- Hormonal control resets the set-point to a desirable level
- To that end a signal is sensed & processed
- In pathologic conditions the actual set-point differs

Your Business:
The PDCA cycle is not a fictional construction

- Your business is a system (aufbau & ablauf)
- That system has its own level of performance
- Management sets performance goals
- A KPI is measured & communicated
- Aberrant conditions require action

Summary 2/2

The **PDCA cycle** is not a fictional construction, but
a cybernetic system = a system that can function by design

If your PDCA-cycle doesn't work, it must be sick somewhere ?
The patho-physiology of the PDCA-cycle is the topic of this lesson

PATHOLOGY

IDDM (Type-1 DM) : Interrupted loop
NIDDM (Type -2 DM) : Insulin resistance & irresponsiveness
Sedentary lifestyle : No Pull on Glc-compartment
....

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Summary

Operational Definition

Intelligent Design

Step 1. What do you want ?
= Relevance

Step 2. Ask the right question
= What is the problem to solve ?

Step 3. Why doesn't it work ?
= What were your *tacit wrong* underlying assumptions ?

Operational Definition

Intelligent Design = Relevance

Step 1. What do you want ?

What are your **Business Goals** ?

What is your core-business ?
What do you want to achieve ?
What do you need for that ?

Recipe:

Voice of the Customer (**VOC**)
Balanced Score Board / **SWOT** analysis

Operational Definition

Intelligent Design = Relevance

Step 1. What do you want ?

What are your Business Goals ?

KPI Definition 1

Step 2. Ask the right question = What is the problem to solve ?

What are **necessary conditions** to achieve your goal ?

Performance Limiting Variables

= determines the level of Value Generated

Of course it is important to **manage critical resources**

PATHOLOGY

Don't provide excuses
to wait for "external" solutions,
in stead of thinking-up innovative alternatives !!!

Operational Definition

Intelligent Design = Relevance

Step 1. What do you want ?

What are your Business Goals ?

KPI Definition 1

Step 2. Ask the right question = What is the problem to solve ?

What are **necessary conditions** to achieve your goal ?

Performance Limiting Variables

= determines the level of Value Generated

Of course it is important to **manage critical resources:**

= **be aware of opportunity costs = stick to your core-business**

PATHOLOGY

Resources hijacked

for hidden agenda's of stake-holders

Operational Definition

Intelligent Design = Relevance

Step 1. **What do you want ?**

What are your **Business Goals** ?

Step 2. Ask the right question = What is the problem to solve ?

What are **necessary conditions** to achieve your goal ?

Performance Limiting Variable

= determines the level of Value Generated

How will you **steer the course** ?

Value to be Generated translated into Objectives

Objectives translated into **Accountable Targets**

KPI Definition 1

KPI Definition 2

Performance Indices

PATHOLOGY

Triad: (intangible) Values –
Objectives –
(tangible) Targets not defined

Operational Definition

Intelligent Design = Relevance

Step 1. **What do you want ?**
What are your **Business Goals** ?

Step 2. Ask the right question = **What is the problem to solve ?**
What are **necessary conditions** to achieve your goal ?
How will you **steer the course** ?

Step 3. What are your underlying assumptions ?
Do you **understand your business-model** ?
Do you **understand stake-holder objectives** ?

Assumptions are tacitly taken for granted
and are never questioned

Understand your Business Model

- Understand environment in which you operate
- Understand Stake-holder Objectives

My Core Business is Laboratory Diagnosis

- What is the Business Environment ?
- What are Requirements
  of the Diagnostic Process ?
- What are Remediable Weaknesses
  in the Diagnostic Process ?

The Laboratory Diagnosis Business Environment

Managed Health Care

not a free market but a subsidised system

5 parties: patients, insurers, government
health care providers,
industry (pharmaceutical, ...)

Evolve towards consolidation to maximize share of subsidies

Generic KPI area's:
Costs per product

The Laboratory Diagnosis Business Environment

Managed Health Care

not a free market but a subsidised system

5 parties: patients, insurers, government
health care providers,
industry (pharmaceutical, ...)

Diagnostic assets becoming commodities

What is your Vision ?

Lab as a production platform ?

Lab as a consultative service ?

Generic KPI area's:

Costs per product

Consultative services

The Laboratory Diagnosis Business Environment

True intelligent systems technically feasible

Information Technology

5 parties: patients, insurers, government
health care providers,
industry (pharmaceutical, ...)

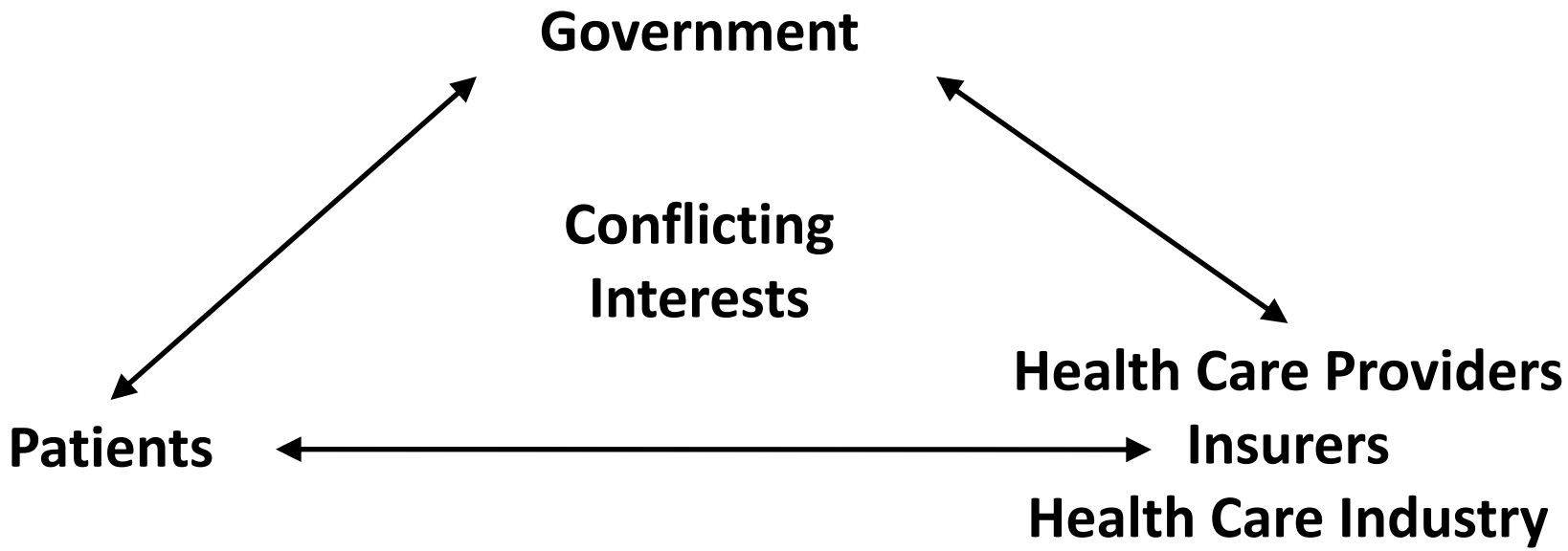
Governance by patient of centralized database technically feasible

Evolve towards integrated whole business systems

Generic KPI area's:

Business integration
IT integration

The Laboratory Diagnosis Business Environment



What is your Vision ?

Equitable Health Care ?

The biggest piece of the cake ?

Generic KPI area's:

Market share

Return / Investment

Understand your Business Model

- Understand environment in which you operate
- Understand Stake-holder Objectives

My Core Business is Laboratory Diagnosis

- What is the Business Environmental ?
- What are Requirements
  of the Diagnostic Process ?
- What are Remediable Weaknesses
  in the Diagnostic Process ?

Requirements of any diagnostic tool

- Relevant
- Accurate
- Timely
- Accessible
- Understandable
- Comparable
- Coherent
- Complete
- Right price / costs

= purposive

= fit for purpose

→ Specs / targets
cfr. method validation file

Logistic requirements of laboratory test

- Relevant : position / function in care algorithm(s) ?
- Accurate : sampling design
- Timely : timing / TAT with respect to care program(s)
- Accessible : test request / reporting of results & conclusions
- Understandable : cumulative reports / reference & decision limits
- Comparable : over methods / time frames
- Coherent : with other tests & procedures
- Complete : identification of lacking / censored data
- Right price/costs : low financial & user burden to patients & medical staff

(non exhaustive list)

Generic KPI area's:

Implementation of Care Paths
Consultative services
TAT, cost

Analytical requirements of laboratory test

- Relevant :
- Accurate : data processing / analytical traceability
- Timely :
- Accessible :
- Understandable : traceability to the applicable clinical studies
- Comparable : commutability over methods / time frames
- Coherent : diagnostic specificity of measurement
- Complete :
- Right price/costs : process excellence

(non exhaustive list)

Generic KPI area's:

Process Excellence
Corrections
iQC-problems
Cost / object

Balance Logistic / Analytical Requirements not respected

Understand your Business Model

- Understand environment in which you operate
- Understand Stake-holder Objectives

My Core Business is Laboratory Diagnosis

- What is the Business Environment ?
- What are Requirements
  of the Diagnostic Process ?
- What are Remediable Weaknesses
  in the Diagnostic Process ?

RISK ANALYSIS - FAULT TREE in Laboratory Diagnosis

OUTCOME

Right test for the right patient at the right time ?
Right interpretation at the right time ?
Right consequential action at the right time ? → **LOGISTICS**

Treat ↑ **Use** ↑ **Interpret** ↑ **report** ↑ transmission generation transcription

BRAIN-TO-BRAIN CYCLE

PATHOLOGY — Wrong Focus

Diagnostic Workup

LIS

Request LabTest → Sample → collect condition → transport → condition aliquot

Reagents → obtain → store → condition formulate

Calibrators → obtain → store → condition formulate

Controls → obtain → store → condition formulate

Instruments → install → maintain → setup

Operators → train

calibrate → measure

ISO/TS 22367:2008

Generic KPI area's

- TAT (B2B)
- Consultative services
- Critical value reporting
- ...

RISK MANAGEMENT - METHOD VALIDATION

Method Validation Process ↔ **Generic KPI: Outcome Care Program**

Number to Treat / Days Hospitalization / …

Clinical Scenario
Inventory of Means
Selection of Means

Requirements ?
Suitability ?

Risk Analysis
determine medically
Important Errors

Select Appropriate
Control Procedures

Implementation

Evaluation of Clinical Path

Diagnostic Process ↔ **Generic KPI: Diagnostic Acuity**

Patient Symptoms

Model
- differential diagnosis
- measurement model

Test Request
Sampling

Evaluation

Treatment

Analysis

Report

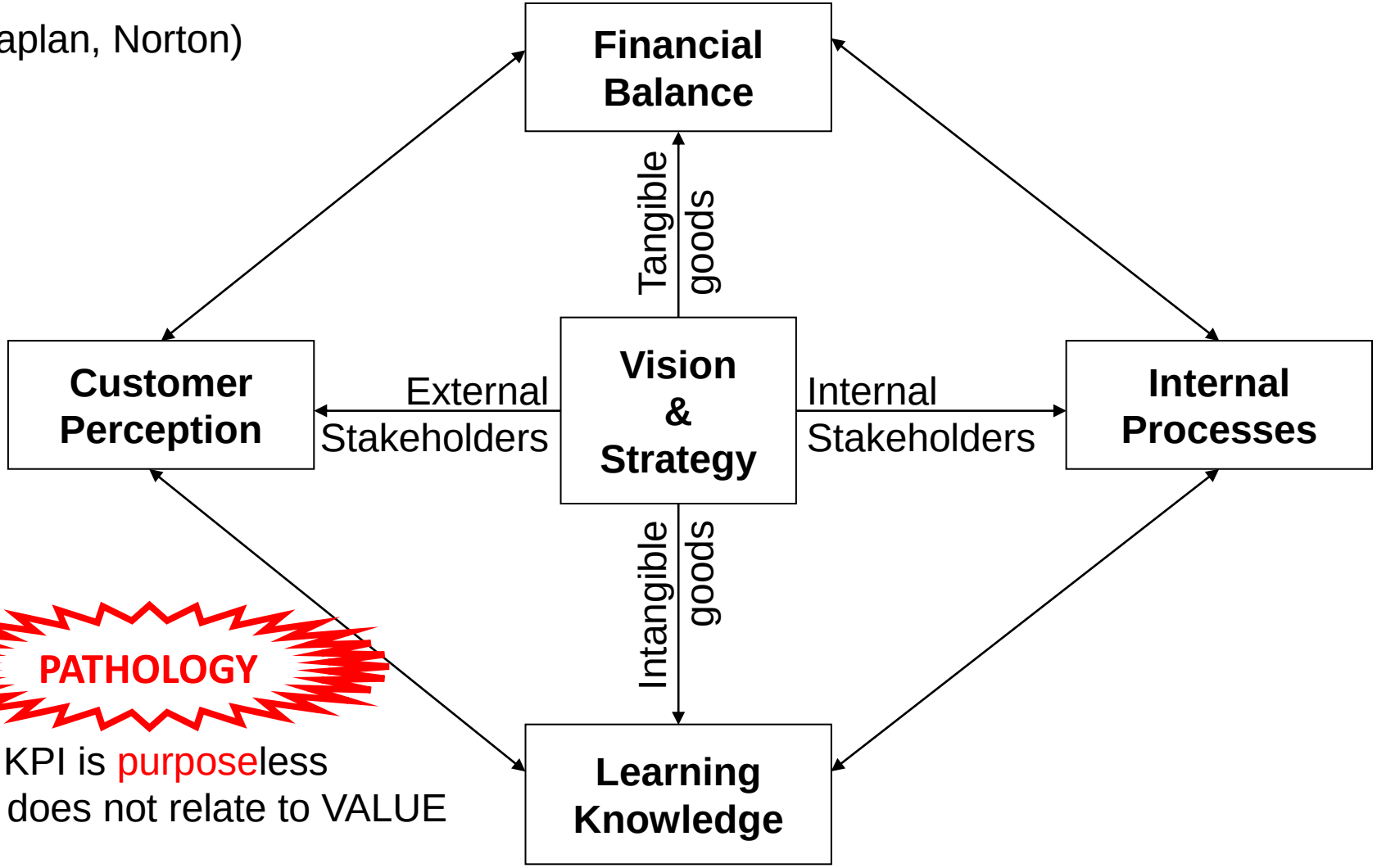
Analytical Process ↔ **Generic KPI: Process Excellence**

PATHOLOGY

Wrong Focus

Summary: Values – Objectives – Targets

(Kaplan, Norton)



Your KPI is purposeless
= does not relate to VALUE

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Summary

Operational Definition

Intelligent Design = Effectiveness

Step 3. What are your underlying assumptions ?

Do you understand your business-model ?
Do you understand stake-holder objectives ?

You assume that "measuring" results in "a beneficial effect"
What are necessary conditions for your KPI
to give the right stimulus ?
= related to incentives ?
= do you have sufficient lay-way to operate ?

KPI
Definition 3

Incentives management ?
Project management ?

PATHOLOGY

No stick
to hit the dog

Operational Definition

KPI's stem from Intelligent Design

Concept-driven

Plan

1. Define goal = Value you want to create
2. Define objective = Target to aim at

Do

Check

3. Make achievements accountable
4. Analyse deviation (variation) from set targets

Fact-driven

Act

5. Stay focused, Stay on track

KPI
Definition 4

FACTS likely to influence decisions = RELEVANT EVIDENCE

RELEVANT EVIDENCE leading to a DECISION = a DIAGNOSTIC PROCESS

Operational Definition

KPI 's as a diagnostic process

Diagnostic scenario's

- is your patient sick ?
- does the patient respond to your therapy ?
- does response persists ?

bench marking
project management
process care

A diagnosis only becomes a diagnosis by becoming consequential

(= to reinforce the right action at the right time)

KPI
Definition 3

Operational Definition

from Key Conditions to Key Deliverables

MANAGEMENT
Concept-driven
(insights in Business Model)

Plan

Act upon
KPI = Performance-Limiting Variables

Do

Check

Act

Make stakeholder accountable for
KPI = delivered outcome key to their Interests

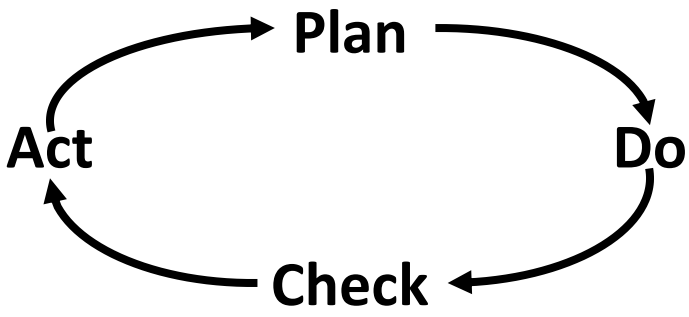
WORKFLOOR
Fact-driven

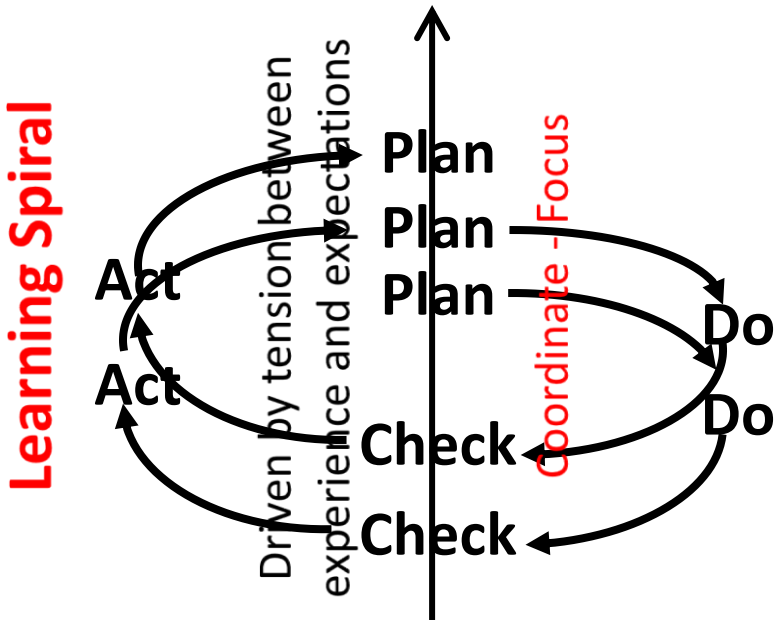
Incentive = tension between the actual and the desired

PATHOLOGY

You are PUSHING Quality in stead of your (internal) stakeholders **PULLING Quality**

Operational Definition





Optimized Stable Processes

Developing Projects

Learning Organization

KPI

Definition 5

Tool : Statistical Process Control

For as long as the process is in use
(In principle) fixed set-points

Tool : Key Performance Indicators

For as long as project realization takes
Set-point(s) evolve(s)
Intermittent Evaluation & Care
narrows cone of uncertainty

The Learning Experience

The answer:
Because of
Experiences & Expectations

α and ώ

The Learning Experience

Modeling : When will iterations converge ?
- law of minimal required complexity
- anything more than that will be undetermined

Ross Ashby

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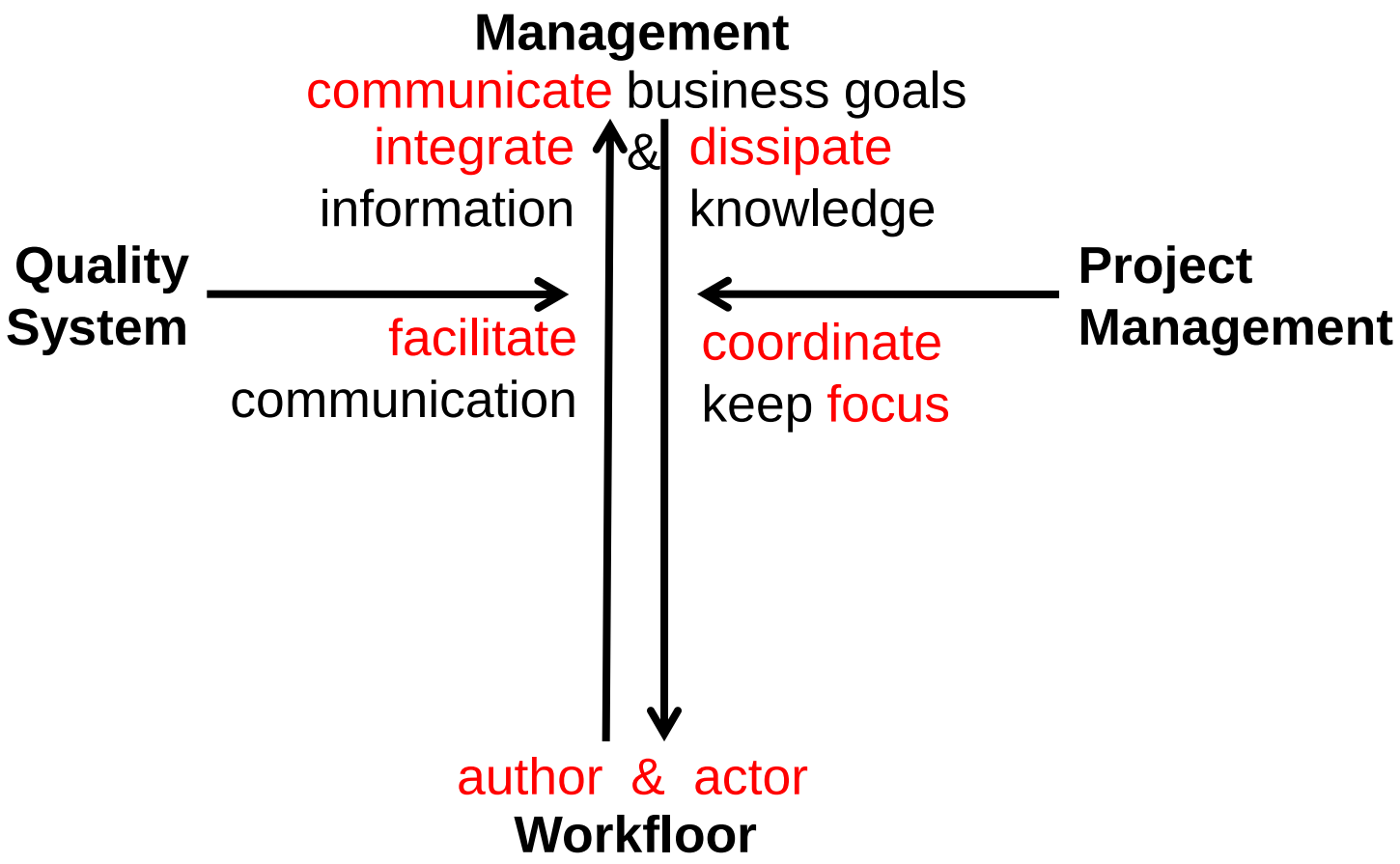
Summary

The Learning Organization (Aufbau)



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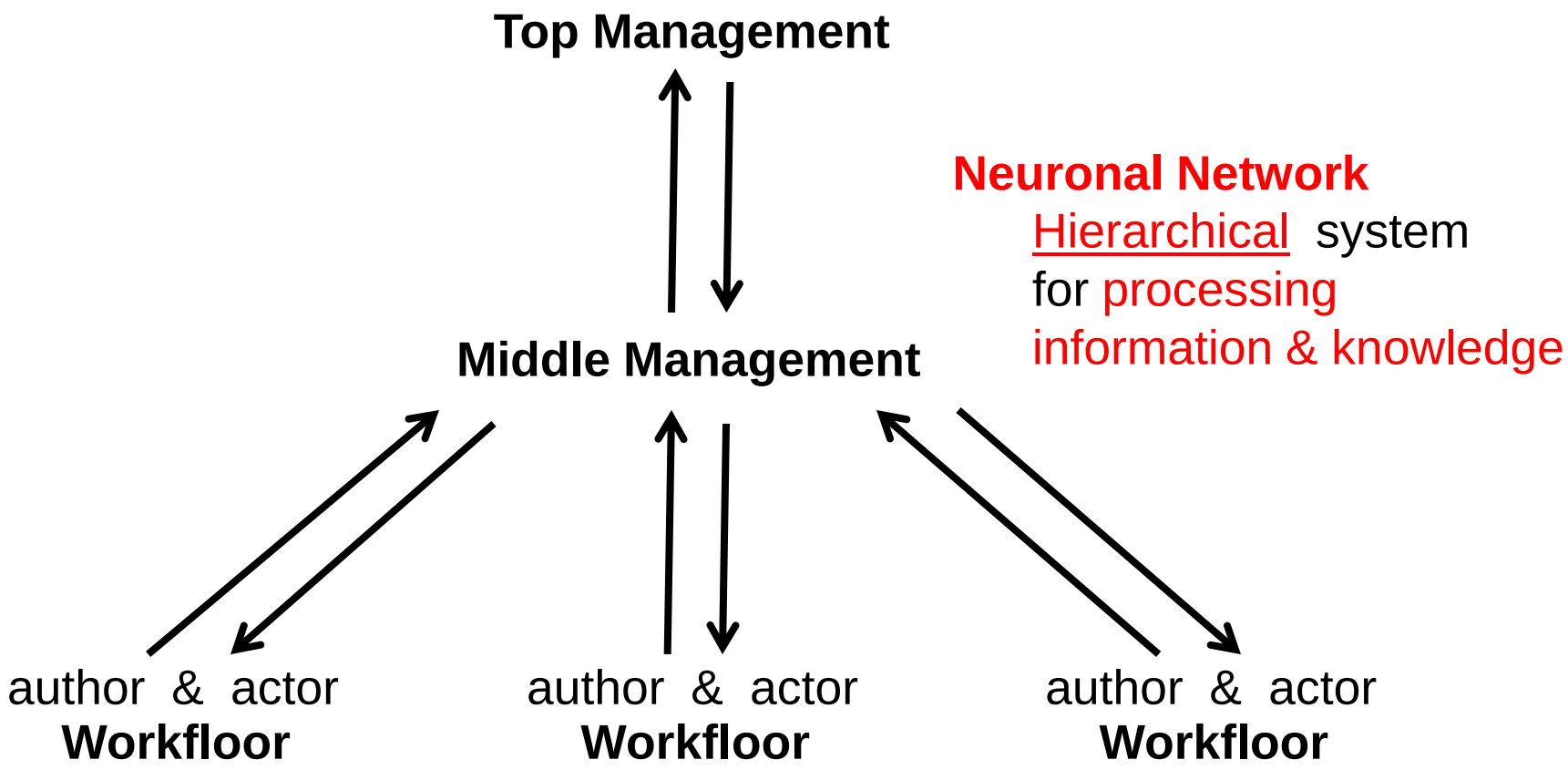

Neuronal hierarchical system is a prerequisite, but insufficient condition

The Learning Organization (Aufbau)
Choose for Robustness not for Fragility

Top Management

Role of middle management

Process information
Decouple failing systems
Communicate
good & bad news
up & down

Neuronal Network

Hierarchical system
for processing
information & knowledge

Middle Management

author & actor
Workfloor

author & actor
Workfloor

author & actor
Workfloor

PATHOLOGY

Middle management has to be held accountable
for execution of the business plan
i.s.o. its own hidden agenda's

The Learning Organization (Ablauf)

Is learning understood ?

Knowledge building:
Open debate (Popper)
Knowledge sharing:
Cooperation and Synergism

KPI definition 5
To learn is
to reinforce desired behaviour

Is the process managed ?

Is learning a **value**d business goal ?
Is learning **process** organized / facilitated ?
Are measurable objectives (**KPI**'s) defined ?
Is staff made accountable ?

Is the chosen learning KPI adequate ?

Participation ?
Project Outcome ?
Timeliness of outcome ?

The Learning Organization

Is the process understood ?

Knowledge building
Open debate
Knowledge sharing
Cooperation and Synergism

Is the process managed ?

Is learning a **value**d business goal ?
Is learning **process** organized / facilitated ?
Are measurable objectives (**KPI**'s) defined ?
Is staff made accountable ?

Is the chosen KPI adequate ?

Participation ?
Project Outcome ?

Why aren't we innovative ?

Competition ?
Eminence - Dogmatic ?
Monopolize power ?

PATHOLOGY

KPI reporting on resources may reinforce wrong behavior ?

Are the required resources there ?

Investigator grants ?
Number of publications ?

The Learning Organization

Is the process understood ?

Open debate
Knowledge sharing
Cooperation and Synergism

Why aren't we innovative ?

Competition ?
Eminence - Dogmatic ?
Monopolize power ?

Innovative cooperation | **Wasteful competition**

scarcity ⟷ **abundance**

resources

(Economic paradigm)

Survival through Adaptability
Altruistic strategies

Temporary advantage through Specialisation
Egoistic strategies

(Darwinian paradigm)

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Summary

With scarcity, abundance, cooperation, competition, resource management, we have entered

the Political Arena

Not to wail about lacking resources, but
to work within the given constraints

Not settling for the status quo, but
innovative thinking (a quantum leap)

Not using KPI's to serve your arguments, but
using data to achieve objectives

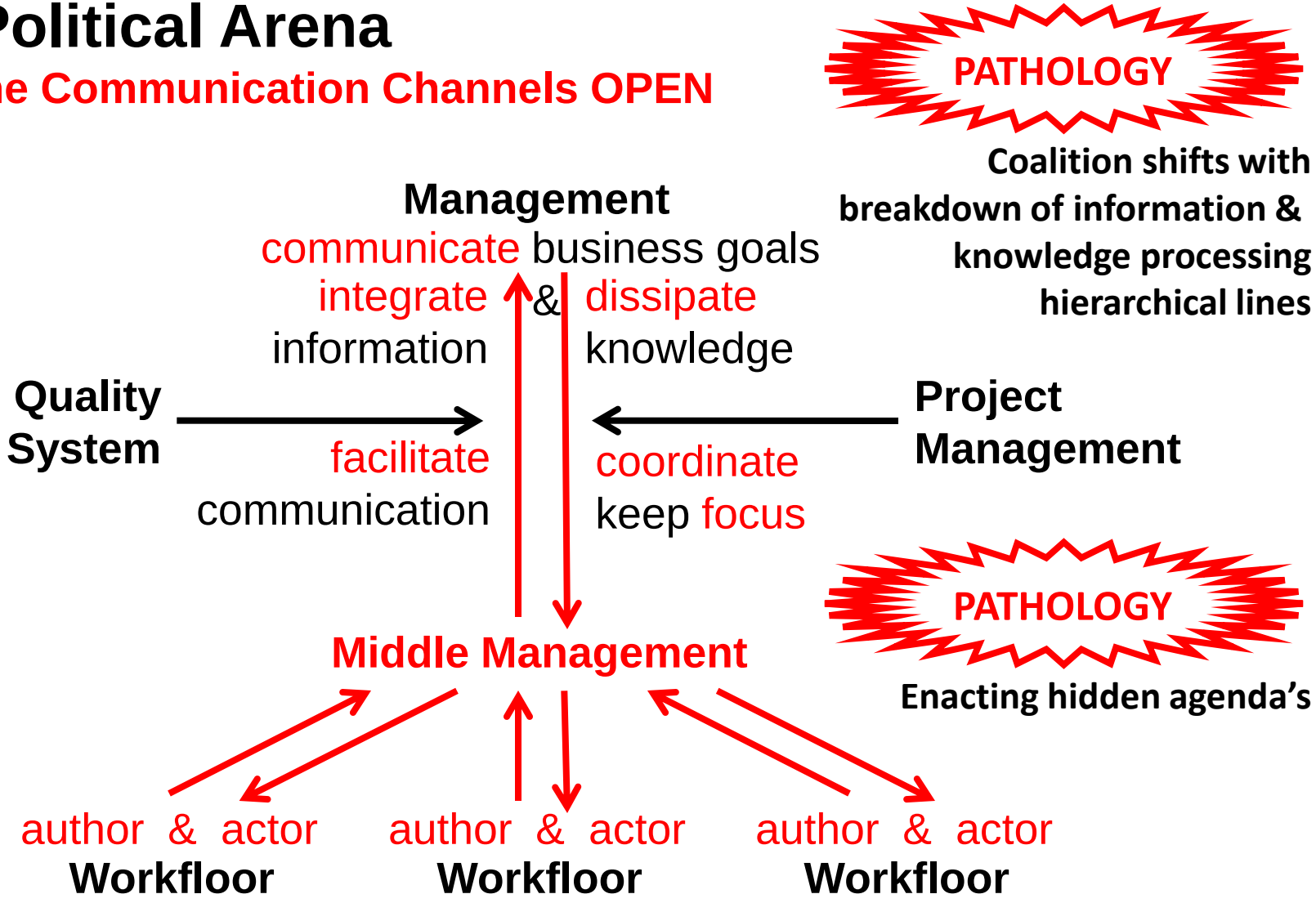
Not the governing coalition against ..., but
we are in it together

PATHOLOGY

The KPI's are hijacked,
as they suit hidden agenda's

The Political Arena

Keep the Communication Channels OPEN



Ownership of processes

- The organization shall **identify & assign owners to main processes**
- **Ownership** does not make one automatically an **expert**

  expert behavior is an attitude = a general competence

  experts share knowledge

  ownership allows one to identify with and to **act morally**

  owners have to be held **accountable**

PATHOLOGY

actors not made the authors of change

- The "quality control/assurance system"

  should facilitate problem solving,

  but it should never assume ownership

- Develop a **culture** op **"knowledge sharing"**

PATHOLOGY

no recognition for contributions

  hurdles to knowledge sharing:

  knowledge is power

  not sharing knowledge makes one irreplaceable

  make " **expansion of shared knowledge** "

  a measurable and accountable " **business target** "

  culture = open (fact-, not opinion-driven) debate ≠ dogmatic

Integral Quality Management

How to optimize the functioning of your people ?

1. Focus on clients
2. Leadership
3. **Involvement of People** → **Quality is a task of all**
   Ownership of Processes
   Learning Organization
   Coaching
4. Process approach
5. System approach to management
6. Continual Improvement
7. Factual approach to decision making
8. Mutually beneficial supplier relationships

PATHOLOGY

Lack of an
OPEN, EMPATHIC, LEARNING CULTURE

From : command, control, constraint, contract
To : discipline, trust, stretch, support

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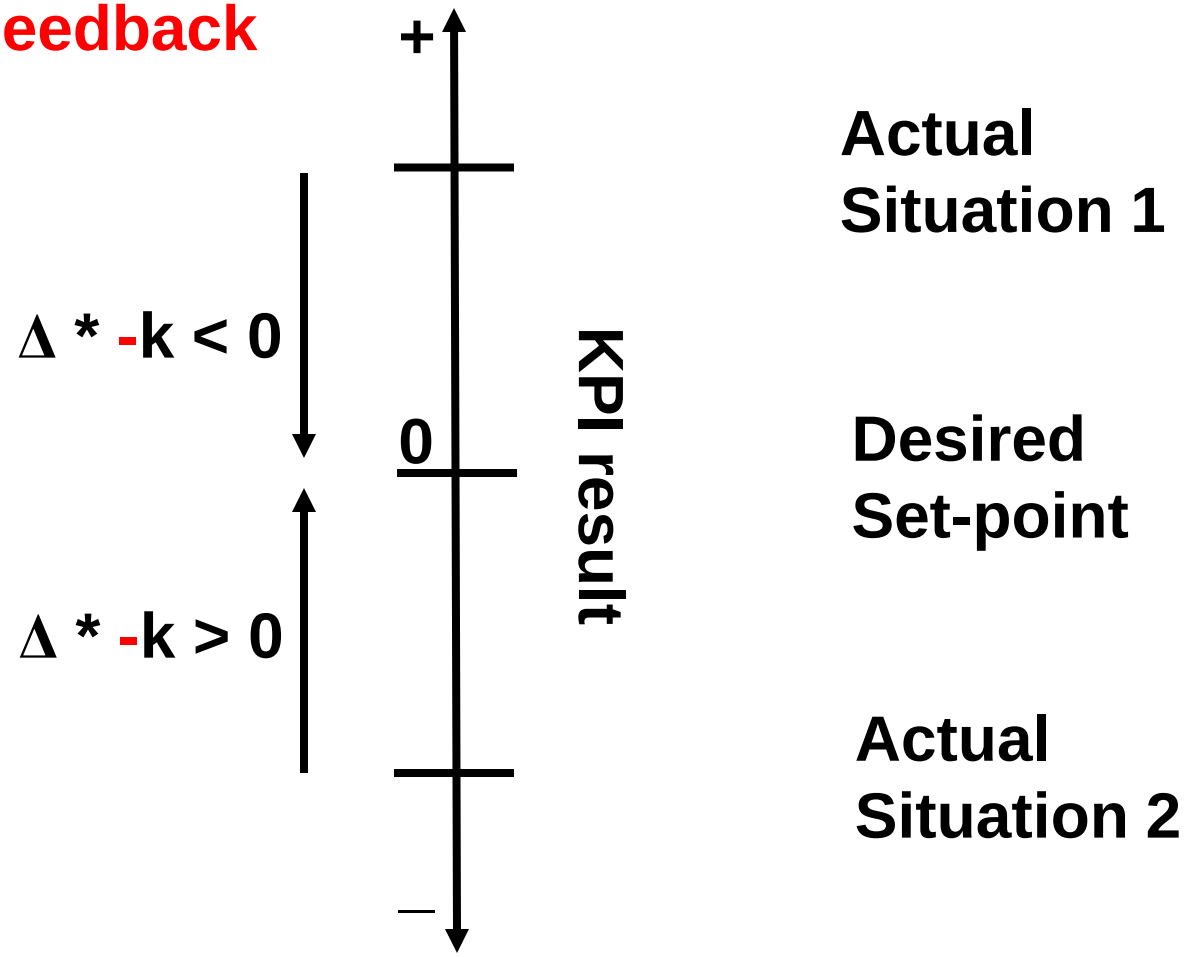
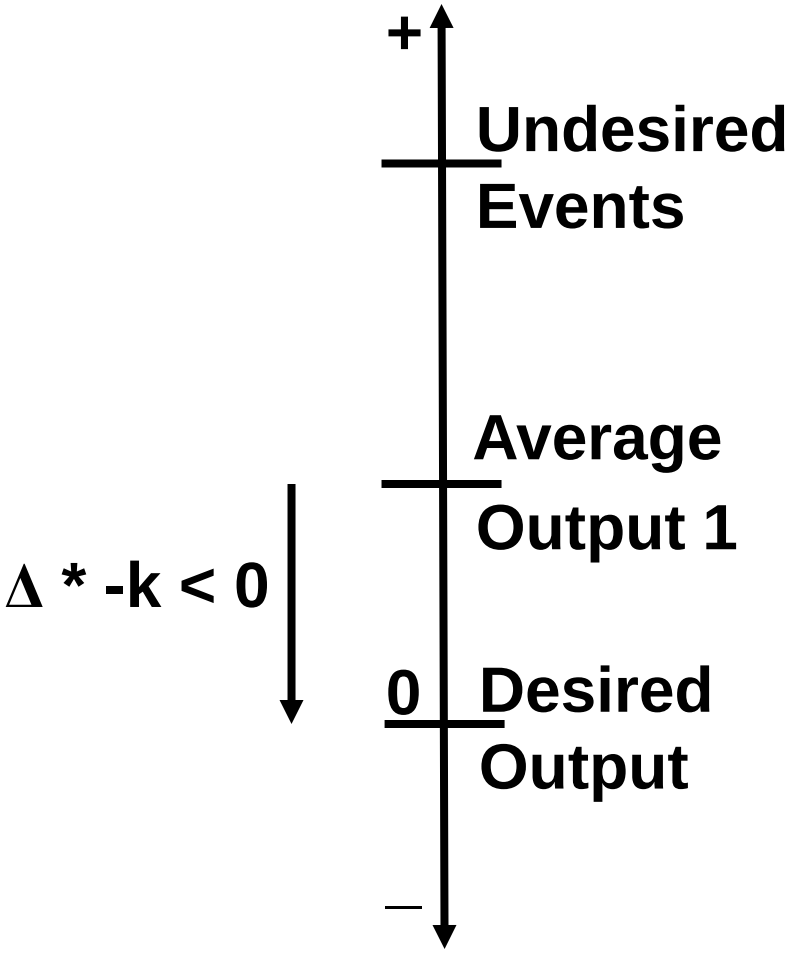
The Learning Process

Reinforcement of the desired outcome

Negative Feedback



Reinforcement of the desired activities
Addressing the Processes in your Organization



Negative Reinforcement

POKA
Fail-safe design

Definition 6:
To **learn** from your mistakes

PATHOLOGY

The KPI's are not used to learn from

Operational Definition

Intelligent Design

Step 1. What do you want ?
= Relevance

Step 2. Ask the right question
= What is the problem to solve ?

Step 3. Why doesn't it work ?
= What were your *tacit wrong* underlying assumptions ?

Step 4. The right solution is the best solution ?
= elegant = simple, the least steps, robust ?

Operational Definition

Intelligent Design

Step 4. The right solution is the best solution ?

= elegant = simple, the least steps, robust ?

People are "programmed" to make "ecological" decisions

= to economize on efforts = to negotiate risk

by

- Bayesian approach = minimize risk, by making an informed gamble

- Heuristic approach = avoid risk, by a work-around

- Economic approach = be aware of opportunity costs

Not to recognize that
a procedure which is not accepted
probably is a bad procedure

So kompliziert wie nötig, so einfach wie möglich

Günther Erdmann
(German composer)

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

Definition 6:
To **learn** from your mistakes

POKA
Fail-safe design

+

Undesired Events

Negative Reinforcement

Average Output 1

To learn is a cooperative endeavor

$\Delta * -k < 0$

0 Desired Output

positive incentive:
recognize authorship of the actors

–

PATHOLOGY

The business culture is not inductive for learning

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

(after Skinner Conditioning paradigm)

+

Undesired Events

Negative Reinforcement

Punishment & Rewards

Extinguish by removal of collateral incentive

Average Output 1

Δ * -k < 0

Definition 6:
to **condition** your coworkers

0 Desired Output

Positive Reinforcement

Positive incentive

–

PATHOLOGY

A culture of coercion in stead of coaching

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

Inefficient:
requires persistent control

+

Undesired Output 1 — **Punish Extinguish**

Average Output 1

0 Desired Output — **Incentives**

–

Increasing efficiency

Punishment & Rewards:
engaging in undesired behavior
elicits a negative stimulus
engaging in desired behavior
elicits a reward

Creates resentment

Negative incentives:
removal of a negative effect by engaging in desired behavior

Positive incentives:
persists as long as
scarcity is not satisfied

Intrinsic motivation
the **desire for self-realization**
= **desire to learn**

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

+	Undesired Output 1	Punish Extinguish
	Average Output 1	
0	Desired Output	Incentives
–		

Increasing efficiency

Punishment & Rewards:

If so inefficient,
why is this then second nature to us ?

- An aggressive / authoritarian stance
  prevents worse aggression ?
- We react aggressively
  when the ideas don't come ?
  when we fear for our authority ?

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

+		
	Undesired Output 1	Punish Extinguish
	Average Output 1	
0	Desired Output	Incentives
–		

Increasing efficiency

Punishment & Rewards:

If so inefficient,
why is this then second nature to us ?

- We react aggressively
  when we fear for our authority ?

R) True **AUTHORITY** stems from
TRUST,
PREDICTABILITY,
FAIRNESS
= COMMUNICATE
THE BUSINESS PLAN
= GENUINE COACHING
= RECOGNIZE AUTHORSHIP

necessary conditions for
self-realization of your co-workers

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

+	Undesired Output 1	Punish Extinguish
	Average Output 1	
0	Desired Output	Incentives
–		

Increasing efficiency

Punishment & Rewards:

If so inefficient,
why is this then second nature to us ?

- When the ideas don't come,
we fear for our authority ?

R) **You don't need to have the answer**
You need to find the solution together

PATHOLOGY

Lack of a culture of togetherness
= not inductive for learning

Reinforcement of the desired activities
Addressing the PEOPLE in your Organization

+		
	Undesired Output 1	Punish Extinguish
	Average Output 1	
0	Desired Output	Incentives
–		

PATHOLOGY

Does the reinforcing stimulus
relate reliably to

value for you ?
Satiety

relevant incidents ?
Contingency

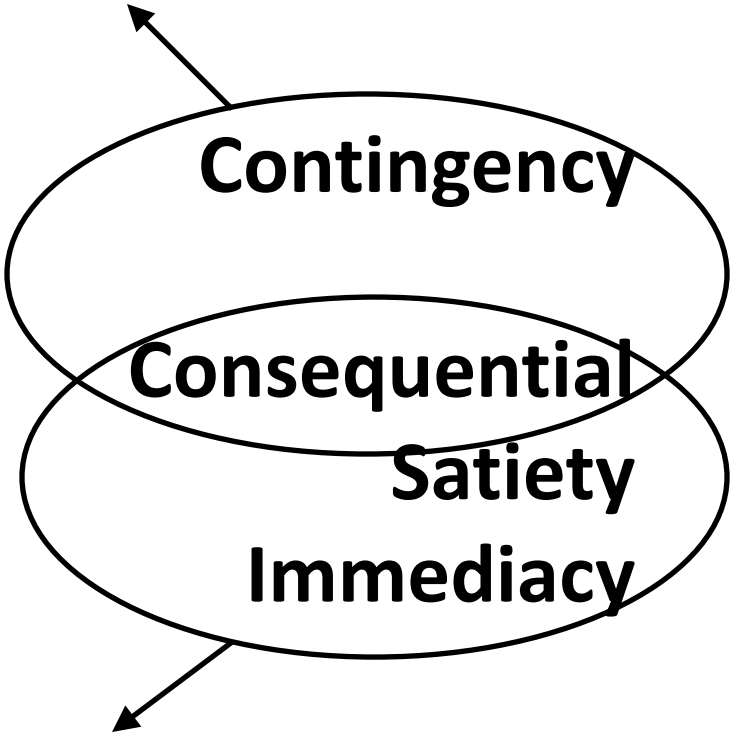
actual events ?
Immediacy

The stimulus is
not fit for purpose / not adequate

Summary

Specific
Measurable
Attainable
Relevant
Timely

Diagnostic pole of the definition



Learning pole of the definition

PATHOLOGY

The diagnostic characteristics of your KPI are not fit for purpose

Teaching Goals
Intuitive Introduction
Requirements of Standards
Operational Definition
- Defining generic KPI's
- The PDCA-cycle
- The Learning Organization
- The political arena
- Reinforcing desired outcome & behavior
- **Working with people**
- Nuts and Bolds

Summary

What is your largest cost-component ?

Why then work with People ?

People *vs* Machines

- Versatility
- Flexibility
- Problem-solving abilities

Generic KPI area's:

Degree of Cross-training
Flow over workplaces
Leadership
…

= measurable elements, suitable for performance appraisal interviews

PATHOLOGY

Human Resource Management
not overlooked by KPI's

Looking for strength in Quantity,
in stead of in Quality

PATHOLOGY

HUMAN RESOURCE MANAGEMENT :
Characteristics of expert (= intelligent) behavior

- Expert **attitudes** (after SR Covey)
  - **Confidence and self-reliance**
  - **Value- / Purpose-oriented**
  - **Empathic, Cooperative, Synergetic**
- Expert **problem solving skills** (= **intelligence**)
  - Can formulate the **right question**
    - sticks to the purpose : Stays on track; Does not lose focus
    - can visualize data sets in order to ask the right question
  - **Recognizes assignable variation** and acts upon this
  - Does not act on random variation
    (recognizes problems without technical solution
    does not introduce variation / deterioration by futile actions)
  - Solves problems using the **simplest, elegant and robust** techniques
  - Organizational talents: multitasking & **time-management**
- **Learns** continuously
  - **Self-observation** : understands why actions / attempts to solve problems
    / communication of results and solutions fail and learns from this
  - After recognizing failing approaches,
    does **not persist with fruitless attempts**,
    but switches to alternative approaches

Summary: Integral Quality Management

1. Focus on clients
2. Leadership
3. **Involvement of People** → **Quality is a task of all**
   Ownership of Processes
   Learning Organization
   Coaching
4. Process approach
5. System approach to management
6. Continual Improvement
7. Factual approach to decision making
8. Mutually beneficial supplier relationships

PATHOLOGY

Lack of an
OPEN, EMPATHIC, LEARNING CULTURE

From : command, control, constraint, contract
To : discipline, trust, stretch, support

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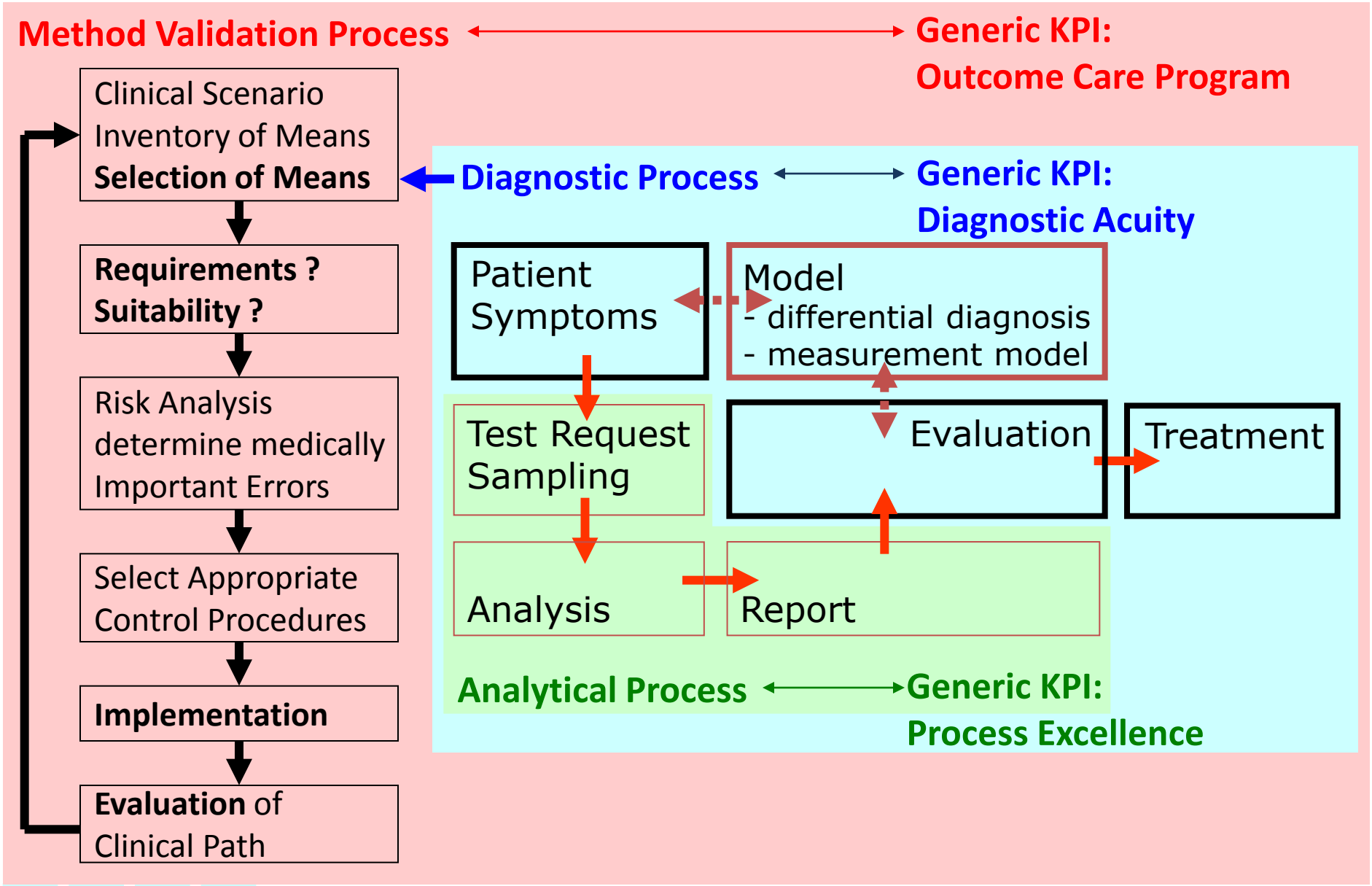
Summary

INVENTORY of KPI Area's



INVENTORY of KPI Area's

Outcome Care Program

Total costs of care
Number to treat
Days to stay
Number of (avoidable) complications
Variance with care path
....

Diagnostic Acuity

Therapy adjustments in function of results
(diabetes treatment, antibiotics use, ...)
Follow-up of alarm values
Follow-up of corrections
...

Organizational Excellence

TAT
Cost per result
Human Resource Management
(degree of cross-training, ...)
...

Analytical Process Excellence

Reduction of avoidable errors (corrections)
Reduction of superfluous corrections (=waste)
Sampling (labeling, volume, hemolysis, ...)
...

Validation of KPI as a good Diagnostic Tool

Specific	Contingency
Measurable	*Quantitative & Validated*
Attainable	**Consequential**
Relevant	**Satiety**
Timely	Immediacy

attainable targets
related to **concerns of process-owner**
= purposive = relevant

Validation of KPI as a good Diagnostic Tool

Specific	**Contingency**
Measurable	*Quantitative & Validated*
Attainable	Consequential
Relevant	Satiety
Timely	Immediacy

inventory of statistics

discard what is waste

keep what is relevant

plan maintenance of your KPI

(validation, set-points, ...)

Validation of KPI as a good Diagnostic Tool

Specific	Contingency
Measurable	***Quantitative & Validated***
Attainable	**Consequential**
Relevant	Satiety
Timely	Immediacy

error-free = good signal/noise

expressed relative to an attainable goal

Validation of KPI as a good Diagnostic Tool

Specific	Contingency
Measurable	*Quantitative & Validated*
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Effective signal = stimulus

detects relevant deviations from set-points

signals positive *vs* negative deviation from set-point

no refractory delays

can be directly interpreted, without extra analysis

Operational Definition

Intelligent Design = Relevant & Optimized

Step 1. What do you want ?
What are your Business Goals ?

Step 2. Ask the right question = What is the problem to solve ?
What are necessary conditions to achieve your goal ?
How will you steer the course ?

Step 3. What are your underlying assumptions ?
Do you understand your business-model ?
Do you understand stake-holder objectives ?

Step 4. The right solution is the best solution ?
= elegant = simple, the least steps, robust ?

Operational Definition

Intelligent Design

Step 4. The right solution is the best solution ?

= elegant = simple, the least steps, robust ?

People are "programmed" to make "ecological" decisions

= to economize on efforts = are willing to take a risk

provided they are not caught red handed

PATHOLOGY

Not to invest in
contingency & immediacy
as prime "logistic" requirements
of a good "diagnostic" KPI

Teaching Goals

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Summary

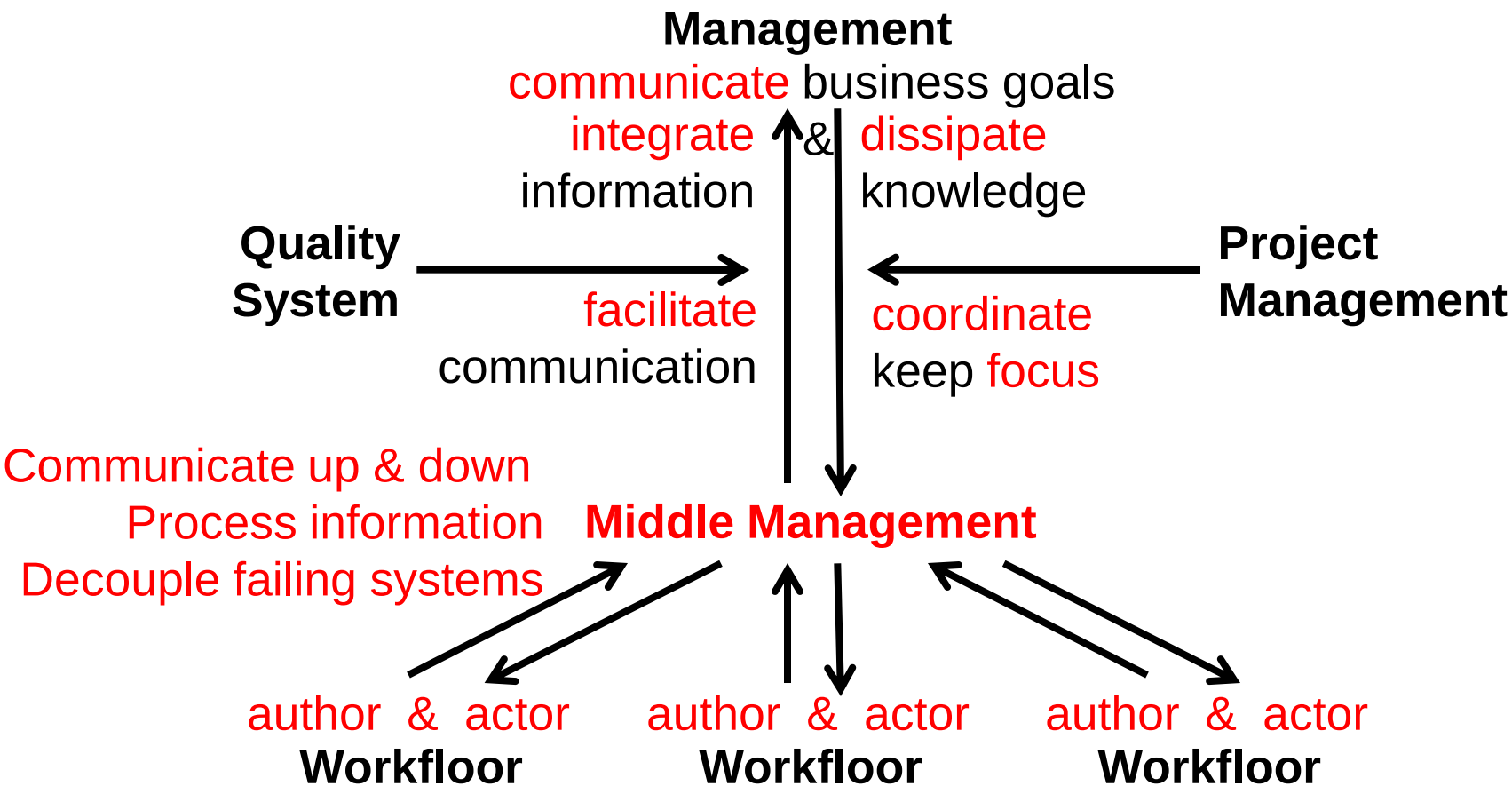
Strategic Planning

Analysis → Objectives

Strenghts
Weaknesses
Opportunities
Treats

Specific
Measurable
Attainable
Relevant
Timely

Open the Communication Channels



Don't flood the Communication Channels

When not to measure ?

- Design from first principles
- Fail-safe POKA-design
  (except for the purpose of validation of POKA implementation)

When to measure ?

- Analysis: identify rate-limiting steps & targets
- Quantitative signals for process-steering
  - convert in-tangible purposes into specific targets
  - have to be relevant & valid
- Before- and after-measurements
  - for maintenance of implemented policies
  - for internal marketing purposes

When to distrust / cancel measurements ?

- Collected data hijacked for hidden agendas ?
- Stimulus fuels undesirable reactions

Take-home Message

1. The introduction of KPI's is important

- for compliance with ISO-15189 and other standards
- for policing the laboratory

KPI's are a **managerial tool**
measuring performance in key area's

2. The introduction of KPI's resulted in

- increased motivation of employee's
- an increase in perfomance
- a net benefit over overhead
- the opposite of the above

insist on **process-ownership**
embrace an **active learning interaction**