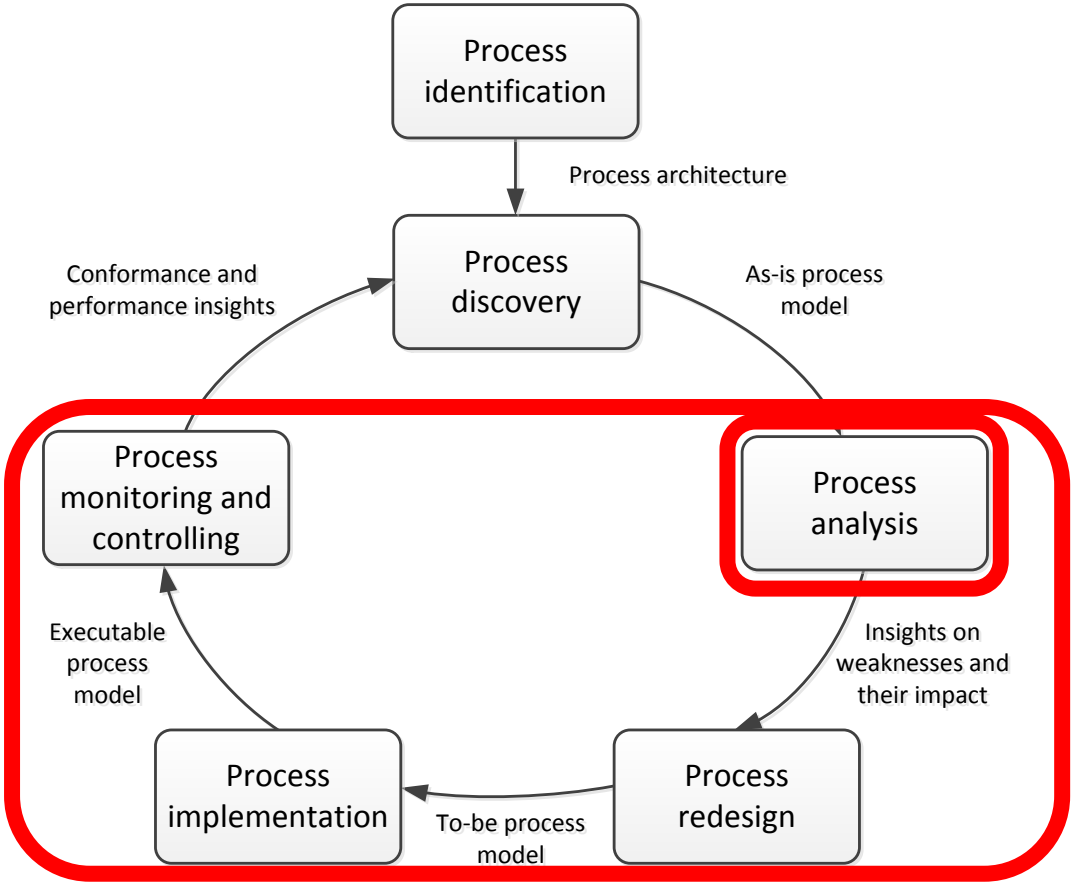
Process Performance Management

Adela del Río Ortega

Virtual Lecture Series on BPM – TU Dortmund

Introduction

The BPM Lifecycle



© M. Dumas *et al.* Fundamentals of BPM, Springer-Verlag, 2013

Introduction

Process Performance Indicators

What are performance indicators?

The attendance to lectures must be increased in 15% before the end of this semester.

Key Performance Indicator

Key performance indicators (KPIs) are **quatifiable metrics** that an organization uses to evaluate its **performance** in terms of meeting its **strategic, tactic and operational goals**.

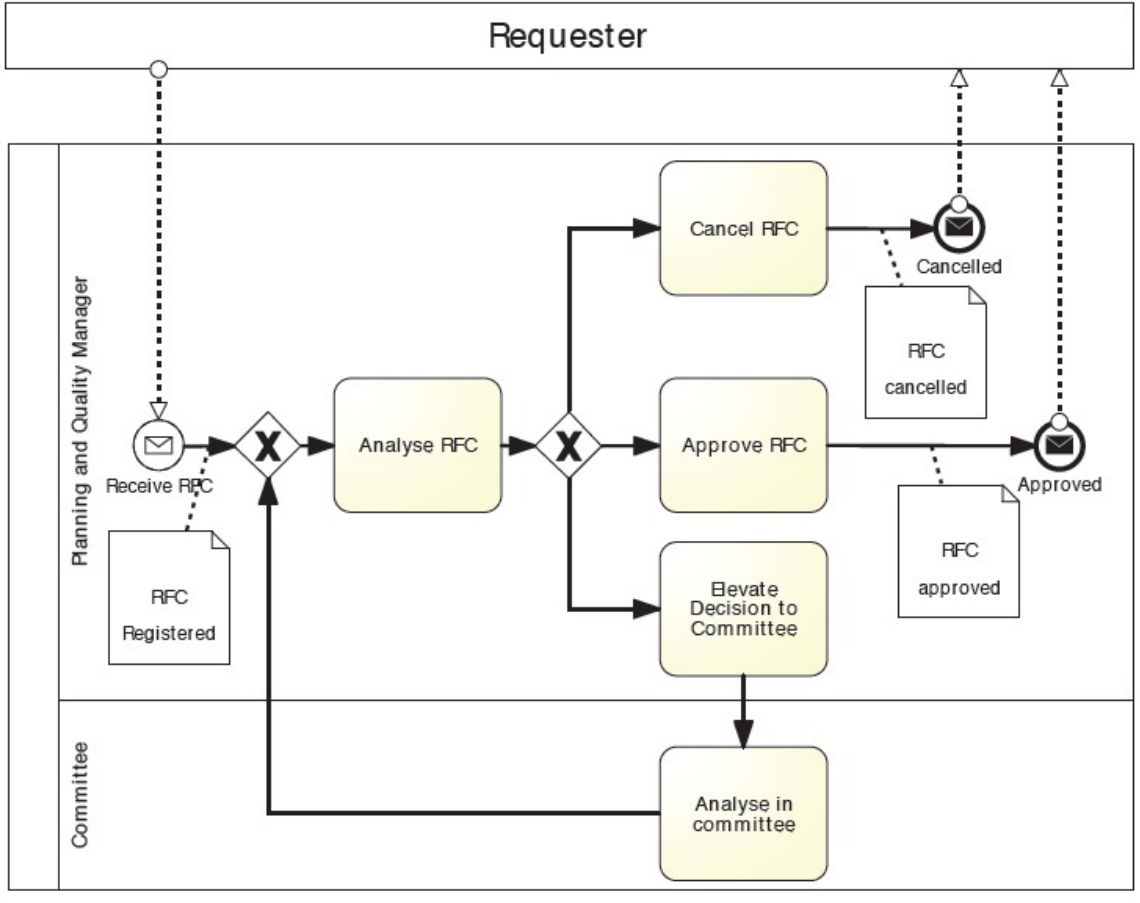
[A. Neely et al., 2005]

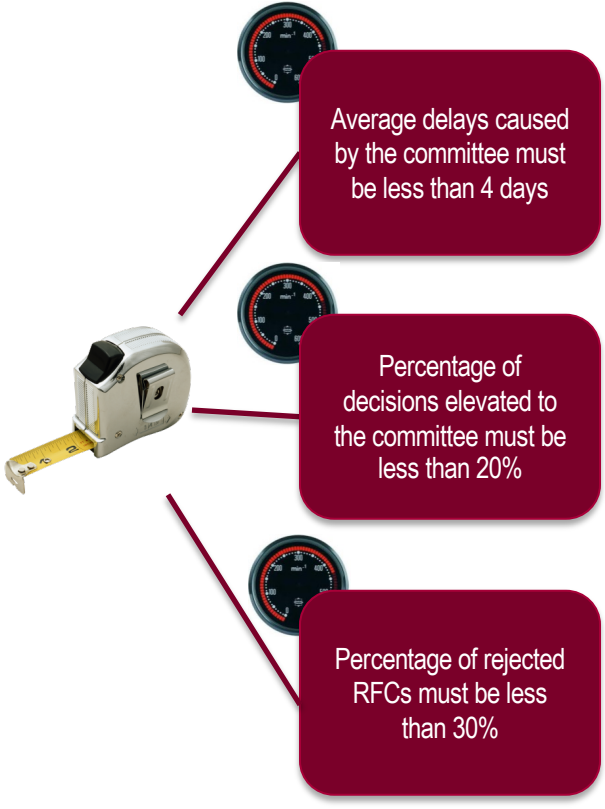
Process Performance Indicator (PPI)

Process performance indicators (PPIs) are **quantifiable metrics** that measure business activity against a **goal**. They allow an evaluation of the **efficiency and effectiveness** of business processes and can be measured directly by **data generated within the process flow** and are aimed at the process controlling and continuous optimization.

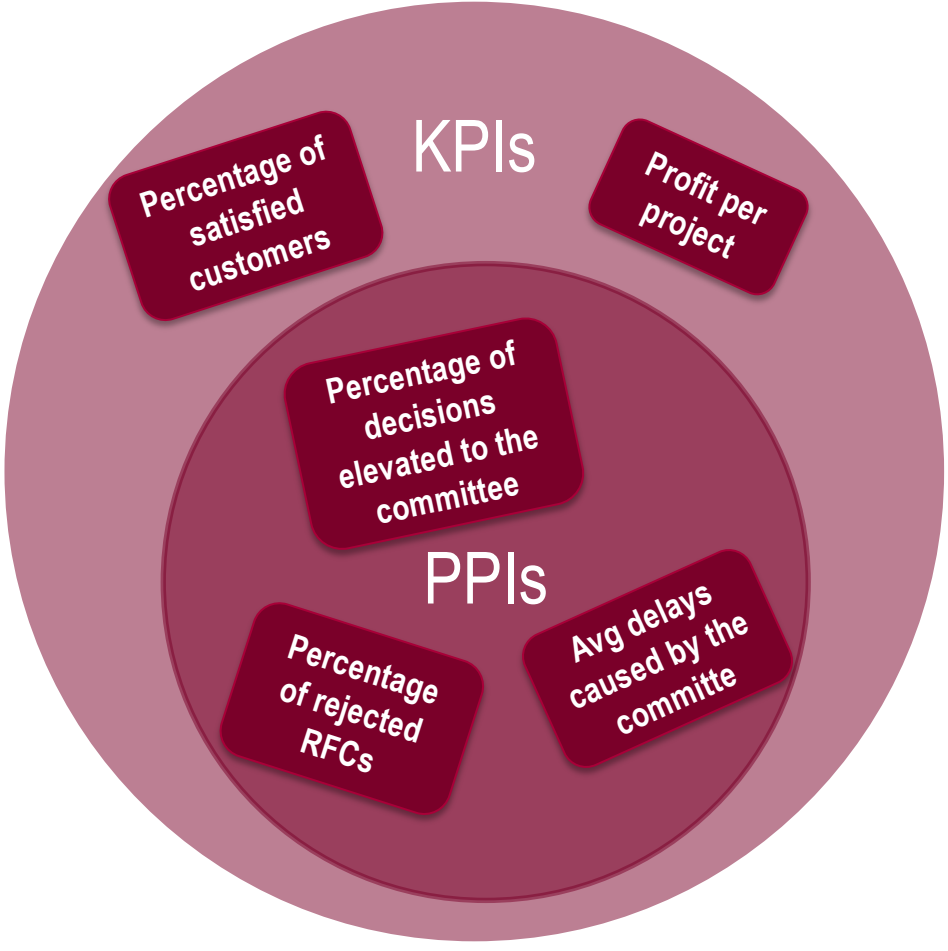
[G. Chase et al., 2011]

Some examples





PPIs vs KPIs


KPIs
Percentage of satisfied customers
Profit per project
Percentage of decisions elevated to the committee
PPIs
Percentage of rejected RFCs
Avg delays caused by the committe

What are they for?

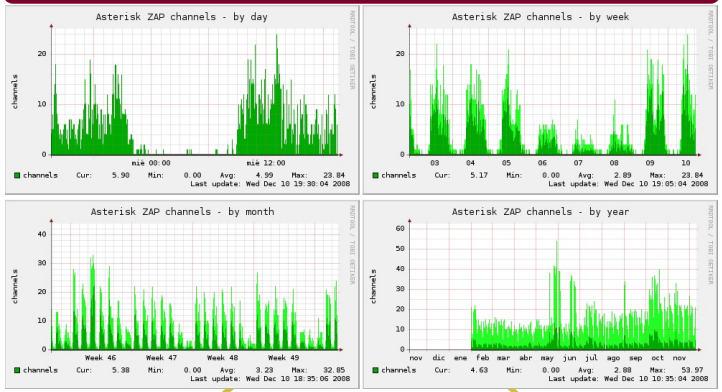
Process Performance Indicator (PPI)

Process performance indicators (PPIs) are **quantifiable metrics** that measure business activity against a **goal**. They allow an evaluation of the **efficiency and effectiveness** of business processes and can be measured directly by **data generated within the process flow** and are **aimed at the process controlling and continuous optimization**.

[G. Chase et al., 2011]

Manager

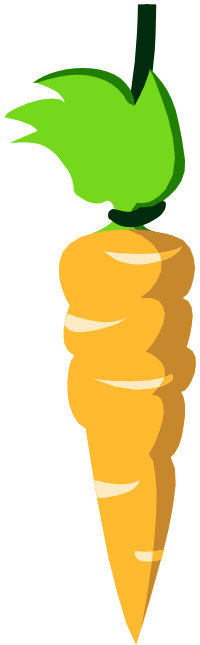
BAM



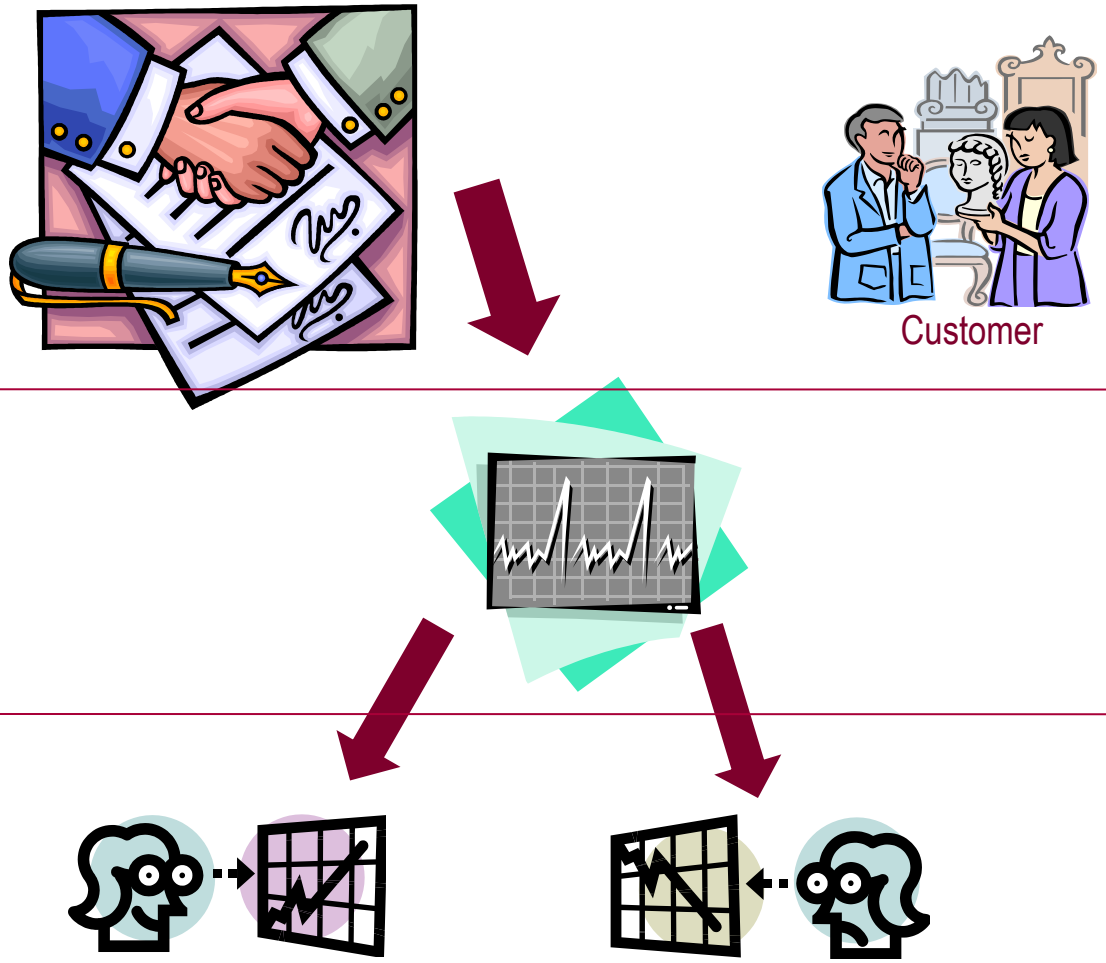
Target values

Time period

Employee



- What is important?
- How to get it?
- **Motivation**


Customer

Introduction

Process Performance Indicators

Process Performance Management

Why should we manage process performance?

Performance Measurement Models

Balanced Scorecard (Kaplan & Norton, 1996)

Performance measurement matrix (Keagan et al.)

Performance pyramid (Lynch and Cross)

Performance prism (Adams & Neely, 2002)

EFQM

- They provide a global vision of WHAT should be measured in an organization (e.g. financial perspective, customer perspective, internal business process perspective, learning and growth perspective)
- It's important to measure process performance (besides other perspectives)

How should we manage process performance?

PPM Activities

Performance planning

Gathering data, observing and documenting

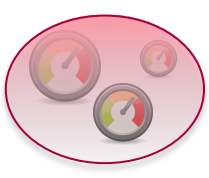
Performance diagnosis

Performance improving

Action and follow-up

PPM Activities

Performance planning



Set of indicators with their associated targets

Gathering data, observing and documenting

Performance diagnosis

Performance improving

Action and follow-up

PPM Activities

Performance planning

Gathering data, observing and documenting

Evaluated indicators and diagnosis information

Performance diagnosis

Performance improving

Action and follow-up

PPM Activities

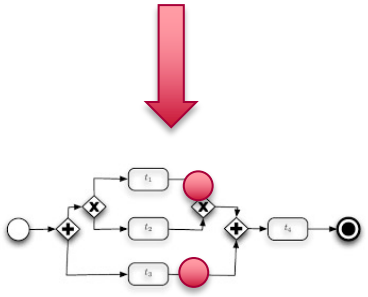
Performance planning

Gathering data, observing and documenting

Performance diagnosis

Performance improving

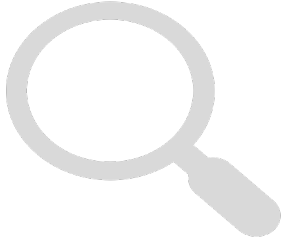
Action and follow-up



Weaknesses and areas for improvement identified

PPM Activities

Performance planning



Gathering data, observing and documenting

Performance diagnosis

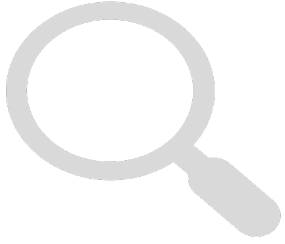
Performance improving

Design and implementation of an action plan

Action and follow-up

PPM Activities

Performance planning



Gathering data, observing and documenting

Performance diagnosis

Performance improving

Action and follow-up

Conclusions on performance improvement and plan execution

PPM Activities

Performance planning

Gathering data, observing and documenting

Performance diagnosis

Performance improving

Action and follow-up

PPM Activities

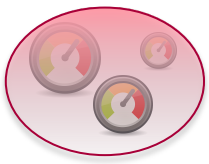
Performance planning

Gathering data, observing and documenting

Performance diagnosis

Performance improving

Action and follow-up



Set of indicators with their associated targets

What PPIs should I define?

Process performance indicators are multi-dimensional

Devil's Quadrangle Dimensions

TIME

COST

QUALITY

FLEXIBILITY

Brand and Kolk, 1995

Dumas et al., 2013

Devil's Quadrangle Dimensions

TIME

COST

QUALITY

FLEXIBILITY

Cycle time

Waiting time

Service time

…

Devil's Quadrangle Dimensions

TIME

COST

QUALITY

FLEXIBILITY

Processing, management or support cost

Activity cost

Unit cost

…

Devil's Quadrangle Dimensions

TIME

COST

QUALITY

FLEXIBILITY

Product or service meets expectations

Promises made to clients are fulfilled

Documents and data ara properly managed

Decisions made are correct…

Devil's Quadrangle Dimensions

TIME

COST

QUALITY

FLEXIBILITY

Capacity to execute new tasks

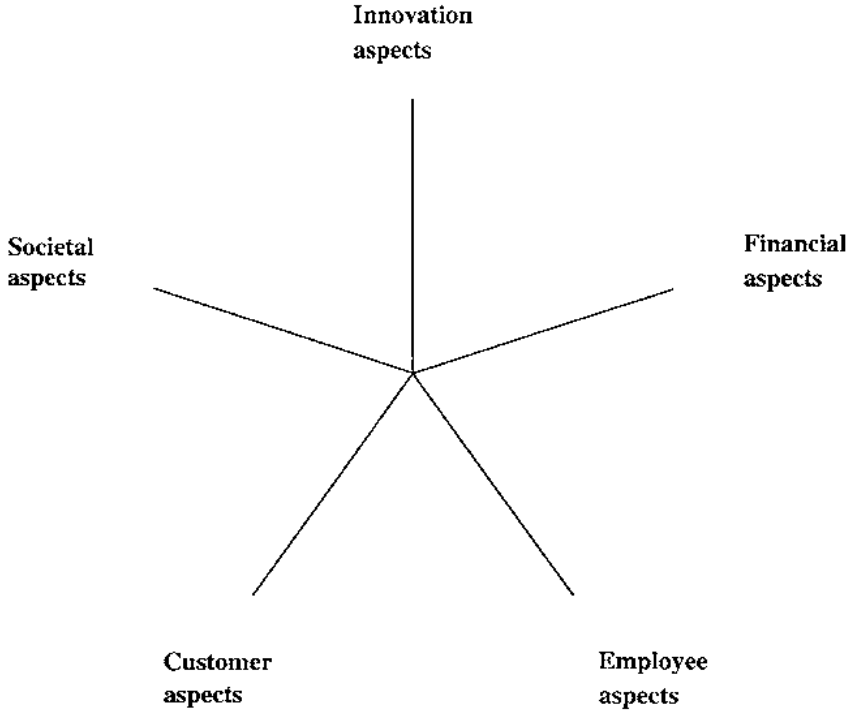
Capacity to adapt to different workloads

Capacity to change rules/assignments

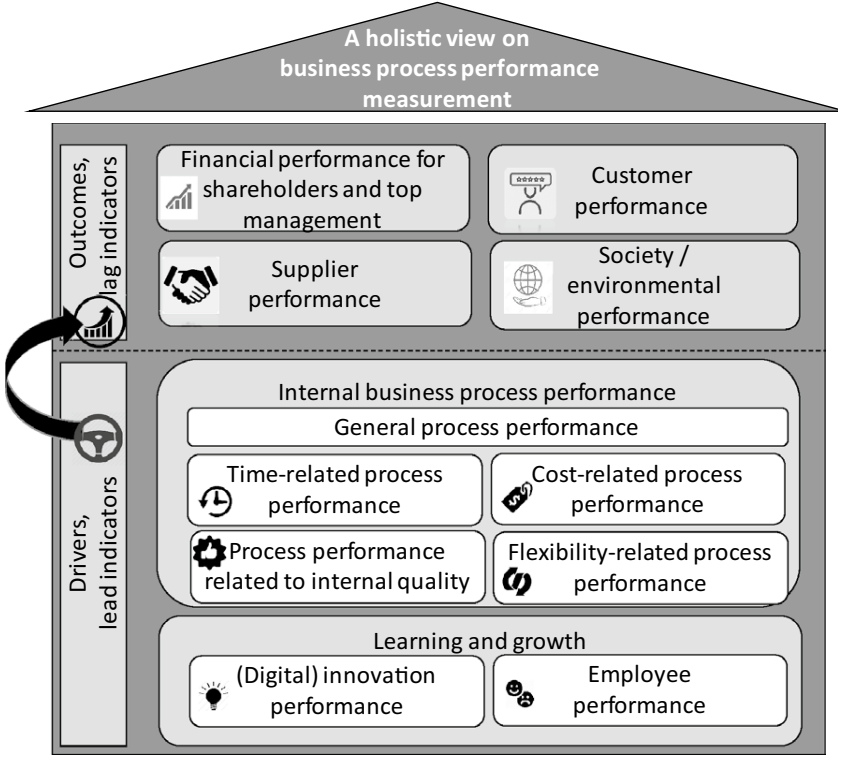
…

However, one may found different classifications

Kueng, 2000



Van Looy and Shafagatova, 2016



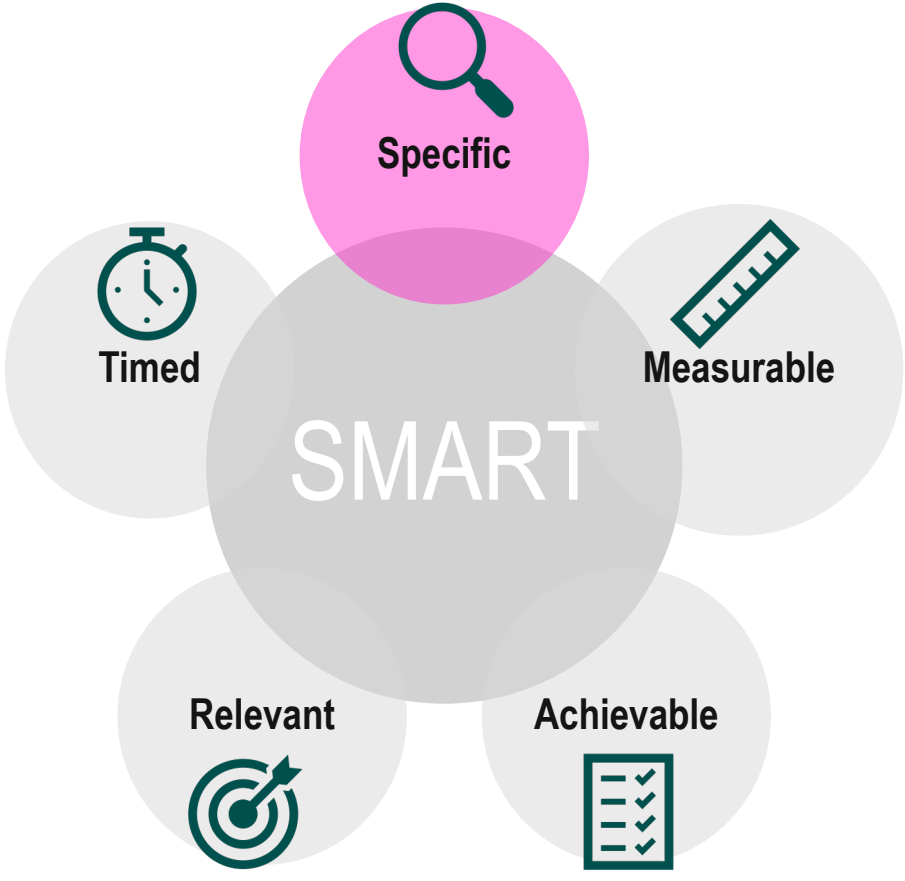
Really?

Let’s take this quality metric…

Product or service meets expectations

Be SMART

Be SMART



An indicator has to be **specific**

For a Make-to-Order process, product or service that meets expectations could be…

If the products ordered are the products provided and the quantities ordered match the quantities provided

If the location, specified customer entity and delivery time ordered are met

If documentation supporting the order is accurate, complete and on time

If it is delivered on specification, with no damage and accepted by the customer

Another example

Cycle time

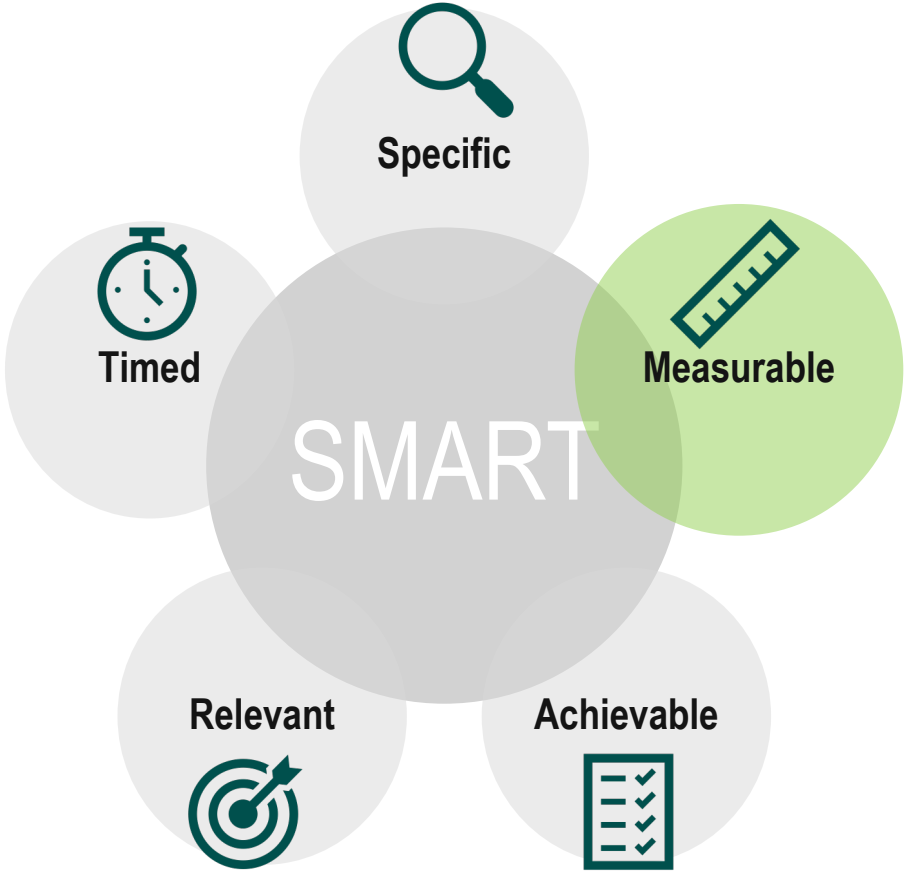
Is it?

Average cycle time

Cycle time variance

Percentage of cases with cycle time less than 5 days

Be SMART



For a Make-to-Order process, product or service that meets exepectations could be…

- If the products ordered are the products provided and the quantities ordered match the quantities provided
- If the location, specified customer entity and delivery time ordered are met
- If documentation supporting the order is accurate, complete and on time
- If it is delivered on specification, with no damage and accepted by the customer

Wait a minute…

How do we measure that the order is delivered on specification, with no damage and accepted by the customer?

We need to **operationalize** the metrics for our processes and information systems

For example

How do we measure that the order is delivered on specification, with no damage and accepted by the customer?

No return activity is done by the customer after delivery

What if we have an event log as data source for computing our metrics?

Since event logs are a very common way of learning the behaviour of a process

What can we measure in an event log?

Which information do we have from an event log?

	amount	org:resource	dismissal	:concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name	xpense	notificationType	lastSent
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1	NaN	NaN	NaN
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04 23:00:00+00:00	NaN	NaN	A1	11.0	NaN	NaN
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100	NaN	NaN	NaN
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100	11.0	NaN	NaN
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100	NaN	P	P
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100	NaN	NaN	NaN
6	NaN	NaN	NaN	Send for Credit Collection	NaN	NaN	complete	2009-03-29 22:00:00+00:00	NaN	NaN	A100	NaN	NaN	NaN
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000	NaN	NaN	NaN
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000	13.0	NaN	NaN
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000	NaN	P	P
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000	NaN	NaN	NaN
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000	NaN	NaN	NaN
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001	NaN	NaN	NaN

Activity

Timestamp

Case ID

Time measures (e.g. Time between “Create Fine” and “Add Penalty”)

	amount	org:resource	dismissal	concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04	NaN	NaN	A1
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100
6	NaN	NaN	NaN	Send for Credit	NaN	NaN	complete	2009-03-29	NaN	NaN	A100
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001

Time

-

226 days
1 hour

205 days
23 hours

Count measures (e.g. Number of “Add Penalty”)

	amount	org:resource	dismissal	concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name	Count
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1	0
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04	NaN	NaN	A1	
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100	
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100	1
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100	
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100	
6	NaN	NaN	NaN	Send for Credit	NaN	NaN	complete	2009-03-29	NaN	NaN	A100	
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000	
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000	
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000	1
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000	
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000	
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001	

Data measures (e.g. Value of “amount”)

	amount	org:resource	dismissal	concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04	NaN	NaN	A1
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100
6	NaN	NaN	NaN	Send for Credit	NaN	NaN	complete	2009-03-29	NaN	NaN	A100
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001

Data

35

71,5

74

Derived measures (e.g. Number of ”Add Penalty” > 0)

	amount	org:resource	dismissal	concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name	Count	Derived
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1	0	False
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04	NaN	NaN	A1		
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100	1	True
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100		
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100		
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100		
6	NaN	NaN	NaN	Send for Credit	NaN	NaN	complete	2009-03-29	NaN	NaN	A100		
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000	1	True
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000		
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000		
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000		
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000		
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001		

Aggregated measures (e.g. average value of “amount”)

	amount	org:resource	dismissal	concept:name	vehicleClass	totalPaymentAmount	lifecycle:transition	time:timestamp	article	points	case:concept:name
0	35.0	561	NIL	Create Fine	A	0.0	complete	2006-07-23 22:00:00+00:00	157.0	0.0	A1
1	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-04	NaN	NaN	A1
2	35.0	561	NIL	Create Fine	A	0.0	complete	2006-08-01 22:00:00+00:00	157.0	0.0	A100
3	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2006-12-11 23:00:00+00:00	NaN	NaN	A100
4	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-01-14 23:00:00+00:00	NaN	NaN	A100
5	71.5	NaN	NaN	Add penalty	NaN	NaN	complete	2007-03-15 23:00:00+00:00	NaN	NaN	A100
6	NaN	NaN	NaN	Send for Credit	NaN	NaN	complete	2009-03-29	NaN	NaN	A100
7	36.0	561	NIL	Create Fine	A	0.0	complete	2007-03-08 23:00:00+00:00	157.0	0.0	A10000
8	NaN	NaN	NaN	Send Fine	NaN	NaN	complete	2007-07-16 22:00:00+00:00	NaN	NaN	A10000
9	NaN	NaN	NaN	Insert Fine Notification	NaN	NaN	complete	2007-08-01 22:00:00+00:00	NaN	NaN	A10000
10	74.0	NaN	NaN	Add penalty	NaN	NaN	complete	2007-09-30 22:00:00+00:00	NaN	NaN	A10000
11	NaN	NaN	NaN	Payment	NaN	87.0	complete	2008-09-08 22:00:00+00:00	NaN	NaN	A10000
12	36.0	537	NIL	Create Fine	A	0.0	complete	2007-03-18 23:00:00+00:00	157.0	0.0	A10001

Data

35

71,5

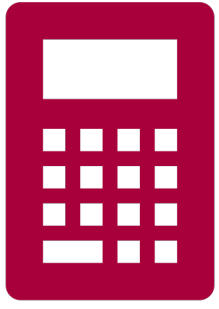
74

60,17

In summary

- Time, Count, Data measures
- Derived measures (boolean / arithmetic operations)
- Aggregated measures (aggregation operations)

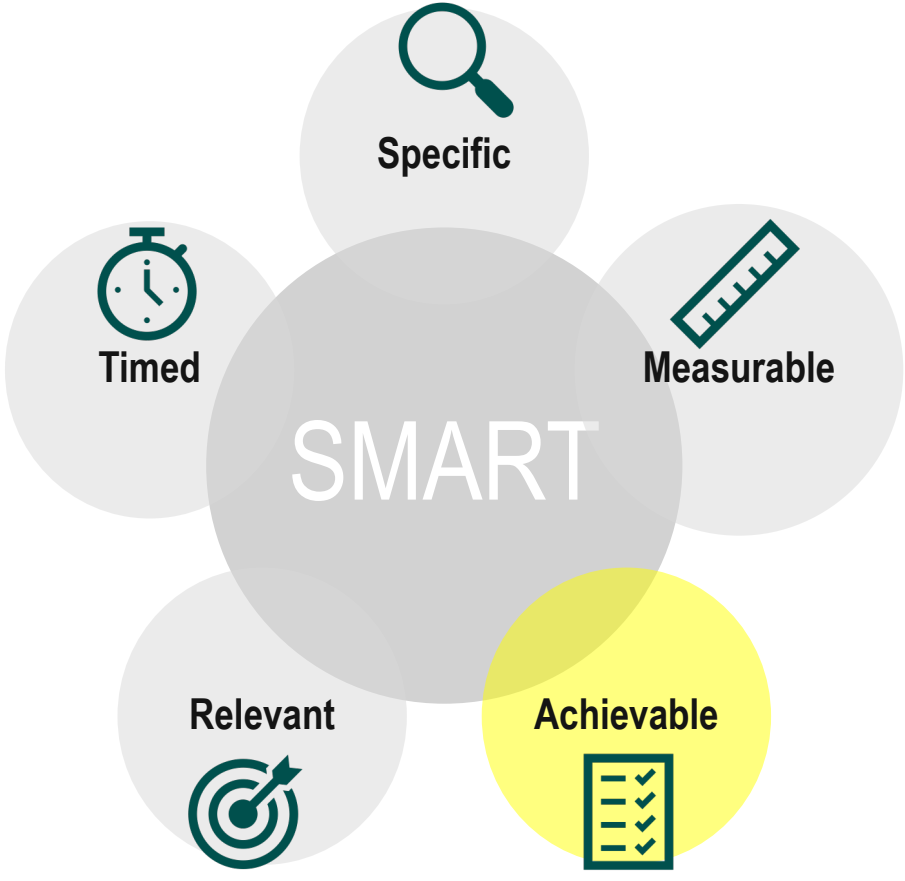
We must take into account that



Not everything can be accurately measured

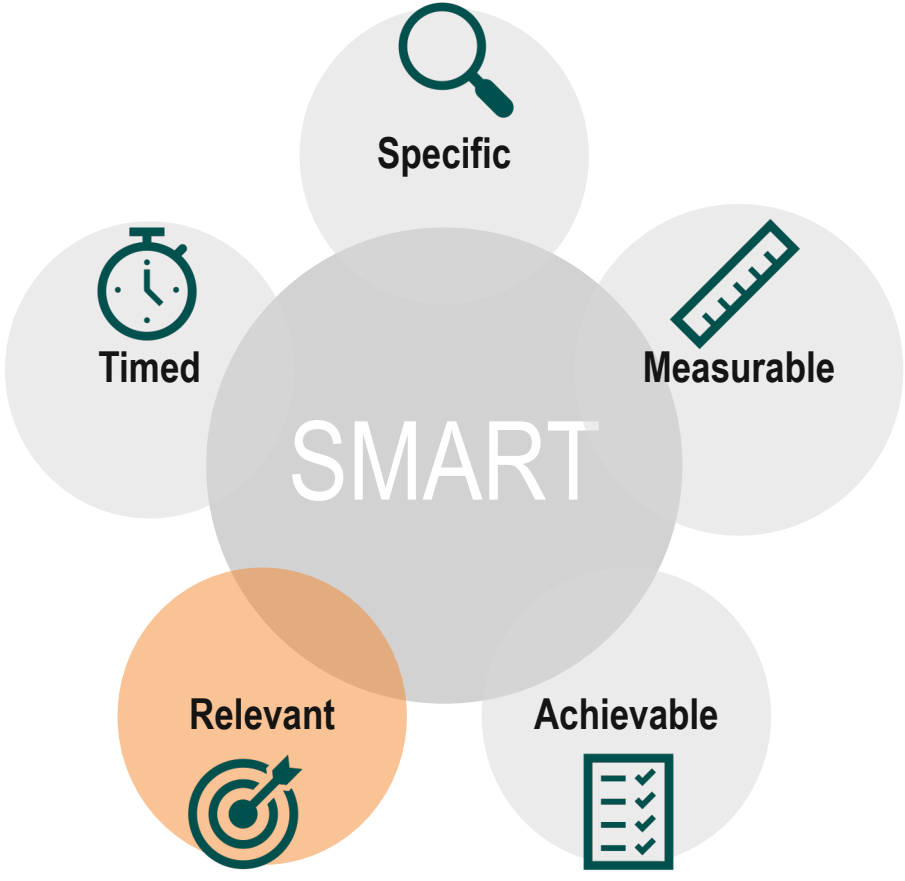
The effort of measuring something must be worth it

Be SMART



If a PPI cannot be achieved, then it becomes useless

Be SMART



Start with strategic goals

Specific to the organization

Cycle time or activity time may not be relevant in some cases

Delays caused by the committee

Time to incident resolution (not incident closed)

Lag vs Lead indicators

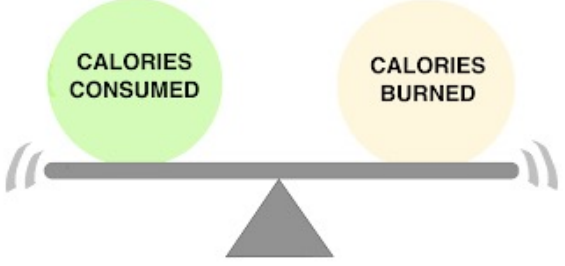
LAG INDICATORS MEASURE GOAL ACCOMPLISHMENT,

EASY TO MEASURE BUT HARD TO INFLUENCE

LEAD INDICATORS PREDICT GOAL ACHIEVEMENT, CAN BE INFLUENCED

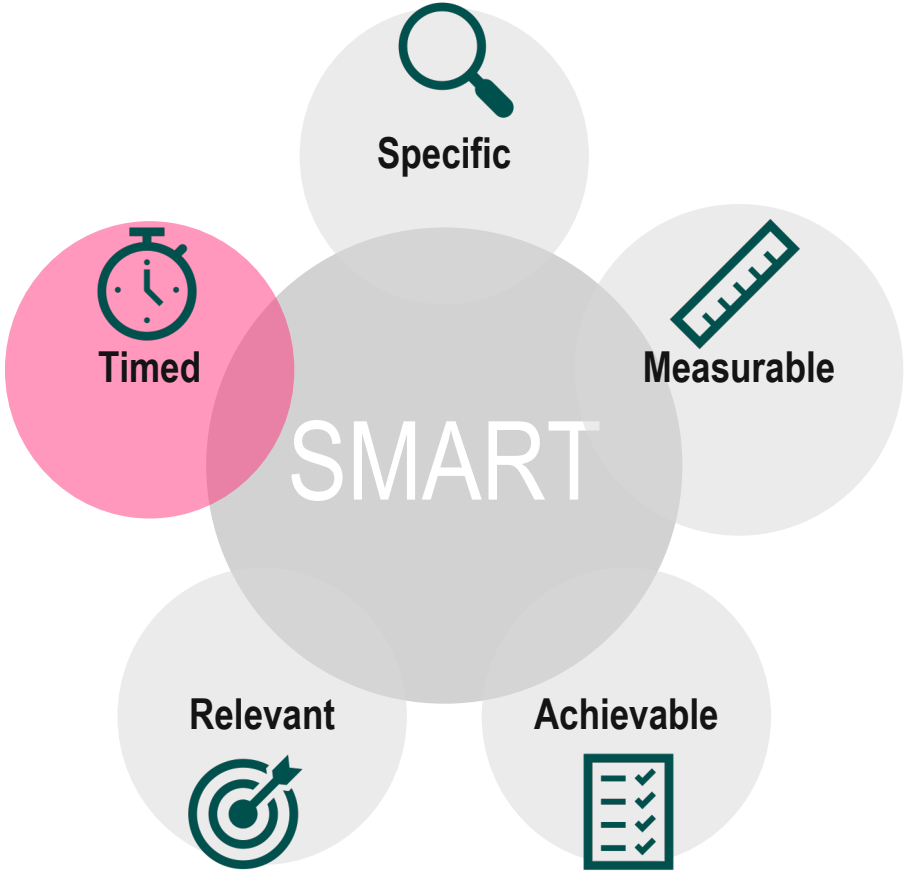
McChesney et al. 2012

To be 5 kg lighter by EOY



Indicators are not static

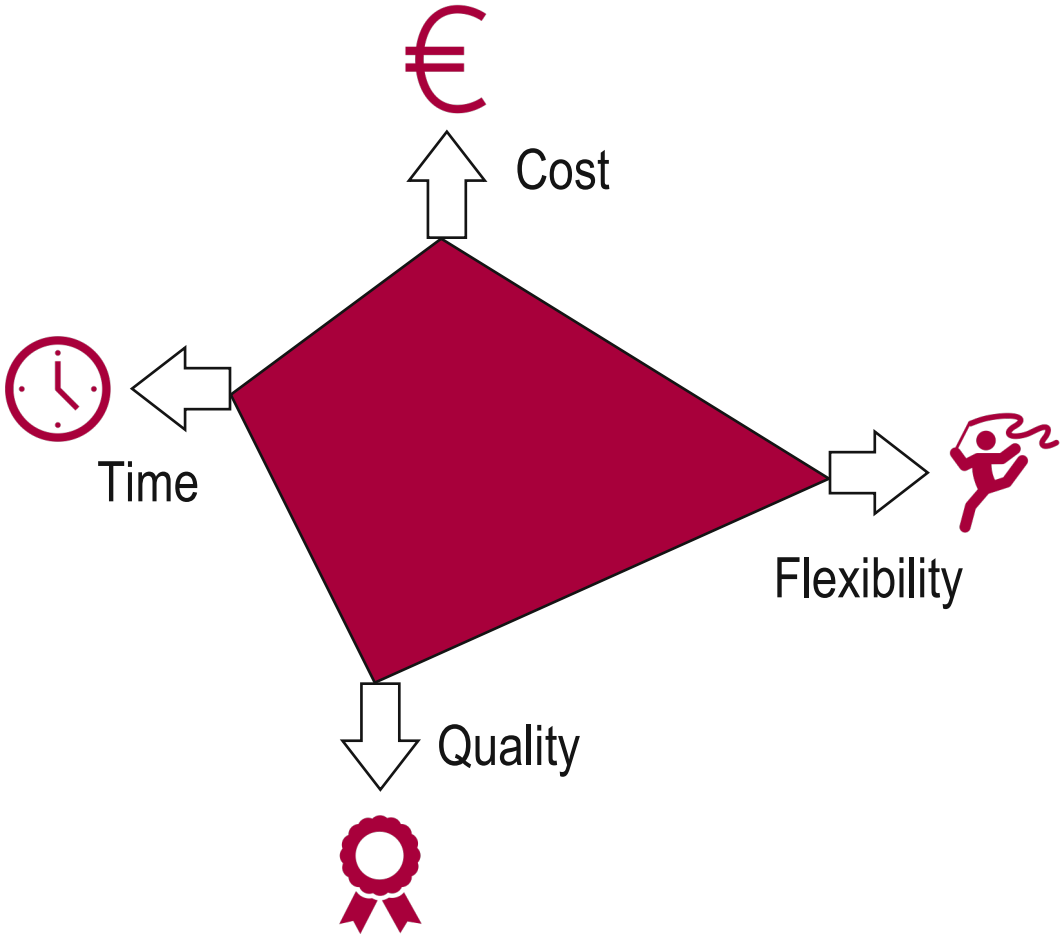
Be SMART



Defined within a time-frame

Be SMART

Be balanced



Be selective

Example

NASA'S GOALS IN 1958

1. The expansion of human knowledge of phenomena in the atmosphere and space;
2. The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles;
3. The development and operation of vehicles capable of carrying instruments, equipment, supplies, and living organisms through space;
4. The establishment of long-range studies of the potential benefits to be gained from, the opportunities for, and the problems involved in the utilization of aeronautical and space activities for peaceful and scientific purposes;
5. The preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere;
6. The making available to agencies directly concerned with national defense of discoveries that have military value or significance, and the furnishing by such agencies, to the civilian agency established to direct and control nonmilitary aeronautical and space activities, of information as to discoveries which have value or significance to that agency;
7. Cooperation by the United States with other nations and groups of nations in work done pursuant to this Act and in the peaceful application of the results thereof;
8. The most effective utilization of the scientific and engineering resources of the United States, with close cooperation among all interested agencies of the United States, with close cooperation among all interested agencies of the united states in order to avoid unnecessary duplication of effort, facilities and equipment.

McChesney et al. 2012

Example

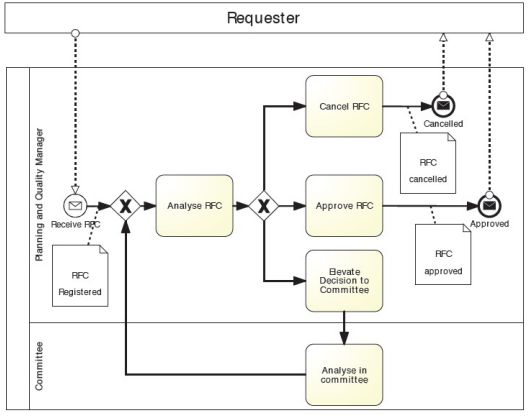
NASA'S GOALS AS OF 1961

"I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth." –John F. Kennedy

One more thing

The importance of automation

Common mechanisms to specificy PPIs



Informal - Natural language

		KPI	consultas	Indicador	Cálculo del indicador	Valor actual (SP)	Valor esperado	roles interesados	Observaciones
	Calidad del lanzamiento	1	1.1	Frecuencia de PLs "reinstaladas"	% PLs "reinstaladas" en algún entorno, con o sin Marcha Atrás, sobre el total de PLs instaladas en el sistema.			GLANZCTICO	Contamos Reinstalaciones sobre Instalaciones en cualquier entorno, independientemente de que sean sobre la misma PL
		2	1.2	Media de Ejecuciones por PL	% ejecuciones sobre el total de PLs planificadas para ese periodo			GLANZCTICO	por ejecución entendemos cualquier operación sobre una PL: instalación, reinstalación o desinstalación (que incluye la marcha atrás)

Low level-implementation

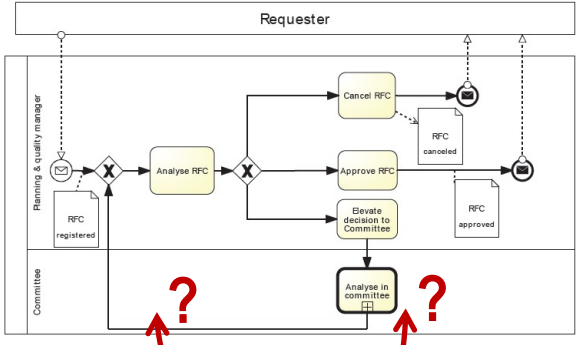
Algoritmo 1 Contracción de caras libres maximales
Entrada: Complejo simplicial $K = \{\sigma_1, \ldots, \sigma_n\}$ no vacío.
Salida: **cierto** si K es contráctil y **falso** en caso contrario.

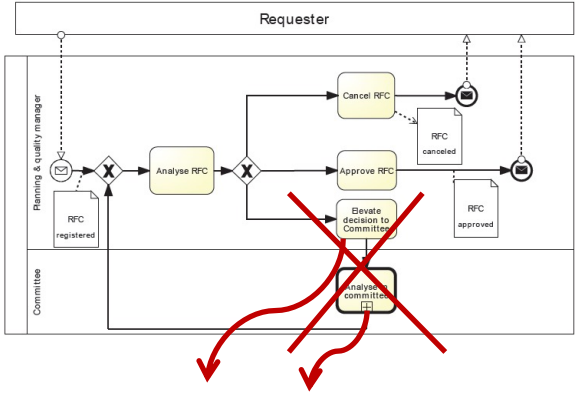
1: **mientras** $K \neq \{\langle v \rangle\}$ **hacer**
2: Elegir un símplice σ_i de K que sea maximal y que contenga una cara libre $\delta\sigma_i$.
3: **si** no hay ningún símplice de esas características **entonces**
4: **devolver falso**
5: **si no**
6: $K \leftarrow K \setminus \{\sigma_i, \delta\sigma_i\}$
7: **fin si**
8: **fin mientras**
9: **devolver cierto**

El algoritmo 1 es bastante raro, ¿qué diablos significa la línea 1.3?

```
SELECT
        Clientes.id_Cliente AS idCliente,
        Clientes.Razon_Soc AS Cliente
FROM
        Clientes
WHERE
        (Clientes.Eliminado <> 1)
AND     (Clientes.Cta_Habilitada <> 0)
ORDER BY
        Clientes.id_Cliente,
        Clientes.Razon_Soc
```

Traceability





PROCESO	Información medida	KPI	Apartado para consultas	Indicador	Cálculo del indicador	Valor actual (SP)	Valor esperado	roles interesados	Observaciones
	Calidad del lanzamiento	1	1.1	Frecuencia de PLs "reinstaladas"	% PLs "reinstaladas" en algún entorno, con o sin Marcha Atrás, sobre el total de PLs instaladas en el sistema			GLANZCTICO	Contamos Reinstalaciones sobre Instalaciones en cualquier entorno, independientemente de que sean sobre la misma PL
		2	1.2	Media de Ejecuciones por PL	% ejecuciones sobre el total de PLs planificadas para ese periodo			GLANZCTICO	por ejecución entendemos cualquier operación sobre una PL: instalación, reinstalación o desinstalación (que incluye la marcha atrás)

PROCESO	Información medida	KPI	Apartado para consultas	Indicador	Cálculo del indicador	Valor actual (SP)	Valor esperado	roles interesados	Observaciones
	Calidad del lanzamiento	1	1.1	Frecuencia de PLs "reinstaladas"	% PLs "reinstaladas" en algún entorno, con o sin Marcha Atrás, sobre el total de PLs instaladas en el sistema.			GLANZCTICO	Contamos Reinstalaciones sobre Instalaciones en cualquier entorno, independientemente de que sean sobre la misma PL
		2	1.2	Media de Ejecuciones por PL	% ejecuciones sobre el total de PLs planificadas para ese periodo			GLANZCTICO	por ejecución entendemos cualquier operación sobre una PL: instalación, reinstalación o desinstalación (que incluye la marcha atrás)

Understandability

PROCESO	Información medida	KPI	Apartado para consultas	Indicador	Cálculo del indicador	Valor actual (SP)	Valor esperado	roles interesados	Observaciones
	Calidad del lanzamiento	1	1.1	Frecuencia de PLs "reinstaladas"	% PLs "reinstaladas" en algún entorno, con o sin Marcha Atrás, sobre el total de PLs instaladas en el sistema.			GLANZCTICO	Contamos Reinstalaciones sobre instalaciones en cualquier entorno, independientemente de que sean sobre la misma PL
		2	1.2	Media de Ejecuciones por PL	% ejecuciones sobre el total de PLs planificadas para ese periodo			GLANZCTICO	por ejecución entendemos cualquier operación sobre una PL: instalación, reinstalación o desinstalación (que incluye la marcha atrás)

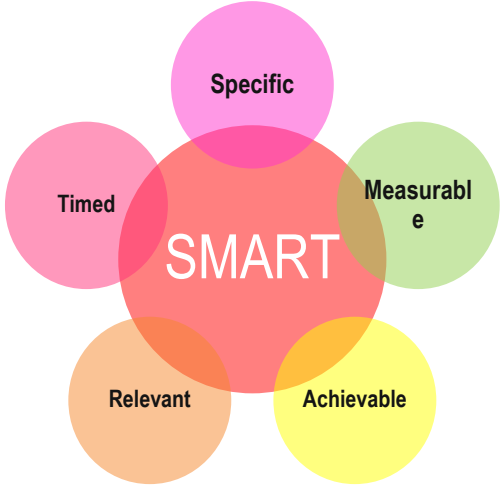
System architect

```
SELECT
        Clientes.id_Cliente AS idCliente,
        Clientes.Razon_Soc AS Cliente
FROM
        Clientes
WHERE
        (Clientes.Eliminado <> 1)
AND     (Clientes.Cta_Habilitada <> 0)
ORDER BY
        Clientes.id_Cliente,
        Clientes.Razon_Soc
```

Business manager

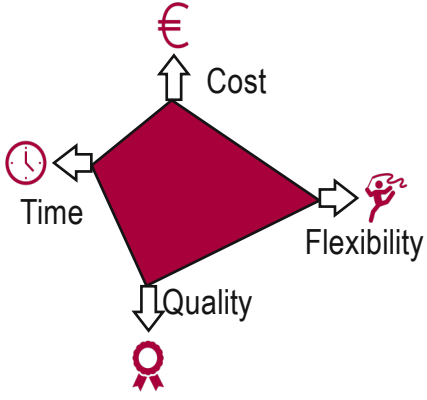
Understandable vs processable

In summary

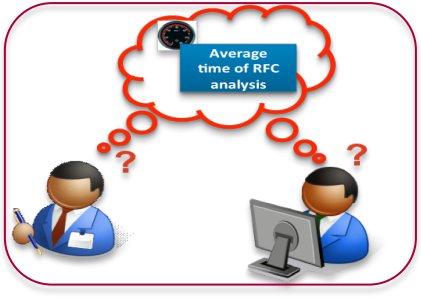


Selective

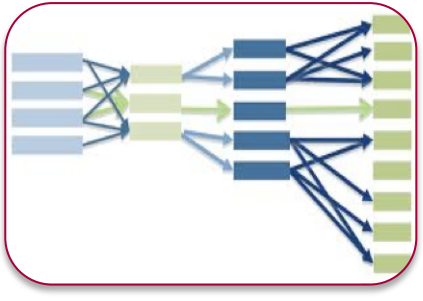
Balanced



Understandability



Traceability



Automation

We can find formal approaches

Formally conceptualizing the incorporation of measures and indicators into process modelling and design methods (Soffer & Wand, 2005)

Proposing an ontology to specify PPIs over semantic business processes (Wetzstein et al, 2008)

Using different variants of order-sorted predicate logic for their definition and relationship with goals (Popova & Sharpanskykh, 2010)

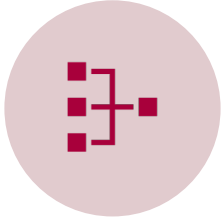
Presenting a metamodel for the definition of PPIs and its translation to DL for their subsequent analysis (Del-Río-Ortega, 2013)

Providing a semantic framework for representing PPIs by means of logical representation of formulas (Diamantini et al, 2016)

Proposing an ontology for PPI definition in the context of Knowledge Intensive Processes (Estrada-Torres et al., 2019)

Or more user friendly approaches

Text-based



Graphical notations

Or more user friendly approaches

Text-based

Graphical notations

Templates (Castellanos et al, 2005, del-Río-Ortega 2016)

Spreadheets (Saldivar et al, 2016)

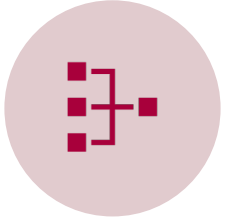
Automated transformation from natural language (Van der Aa et al, 2017)

PPI template example

***PPI*-005**	Average time of RFC analysis
Process	Request for change (RFC)
Goals	• BG-002: Improve customer satisfaction • BG-014: Reduce RFC response time
MeasureDefinition	The PPI is defined as the average of the duration between the time instants when activity Analyse RFC becomes active and when activity Analyse RFC becomes completed
Target	The PPI value must be lower than or equal to 1 working day
Scope	The process instances considered for this PPI are those in Last 100 instances scope
Source	Event logs of BPMS
Responsible	Planning and quality manager
Informed	Chief Information Officer (CIO)
Comments	Most RFCs are created after 12:00

Or more user friendly approaches

Text-based



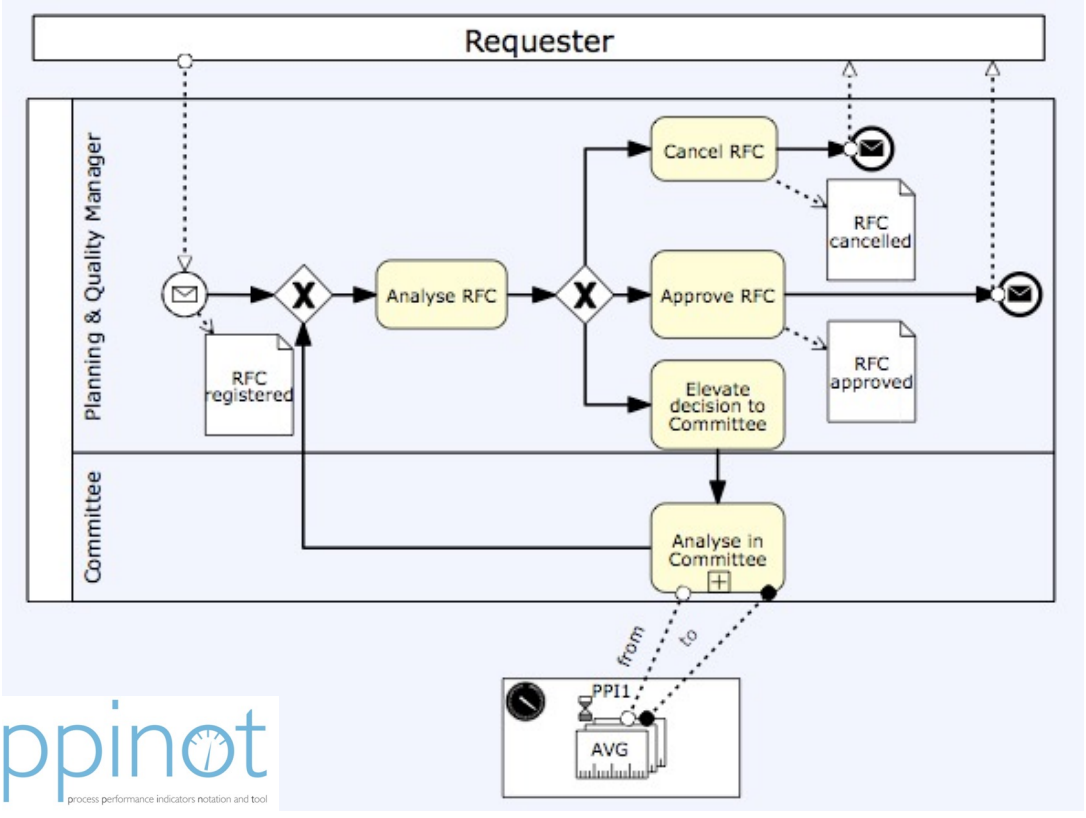
Graphical notations

Extend BPMN and EPC for cost, quality and cycle time PPIs (Kohrer & List, 2007)

Extend BPMN for BAM, including PPIs (Friedenstab et al, 2012)

Graphical notation and editor tool for PPIs (Del-Río-Ortega, 2019)

PPI graphical model example



Wrapping up

PPM Activities

Performance planning

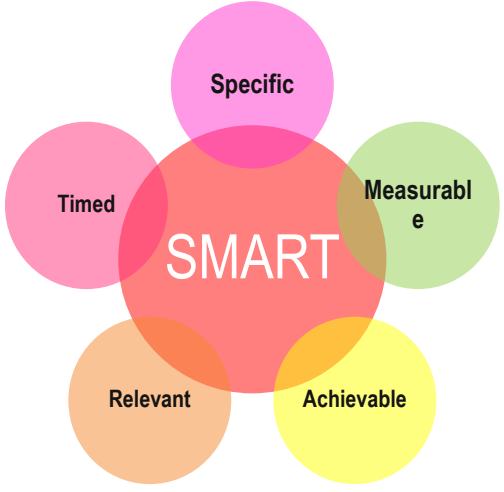
Gathering data, observing and documenting

Performance diagnosis

Performance improving

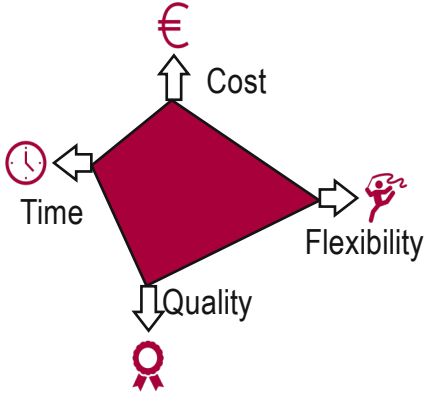
Action and follow-up

PPI Definition

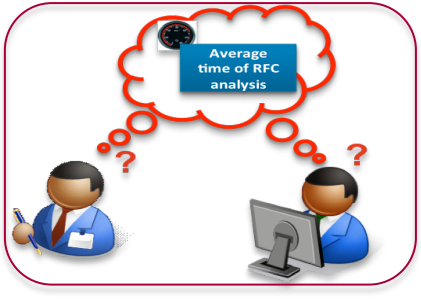


Selective

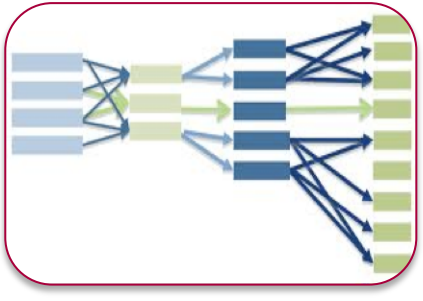
Balanced



Understandability



Traceability



Automation

Dr. Adela del Río Ortega
Universidad de Sevilla
adeladelrio@us.es