PathStone Group

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Metrics to Quantify Production Flow

Agenda

1. Metrics to Quantify Production Flow: What is it ?
2. Metrics Purpose and Benefits
3. First Pass Yield
4. Rolled Throughput Yield
5. Takeaways

Introduction

What is it ?

Distinctive production operational metrics to test, describe and measure processes flows.

Introduction

Purpose and Benefits.

When undertaking an improvement project to enhance the effectiveness of production tests, the choice of metrics used is critical for describing improvements made to the process.

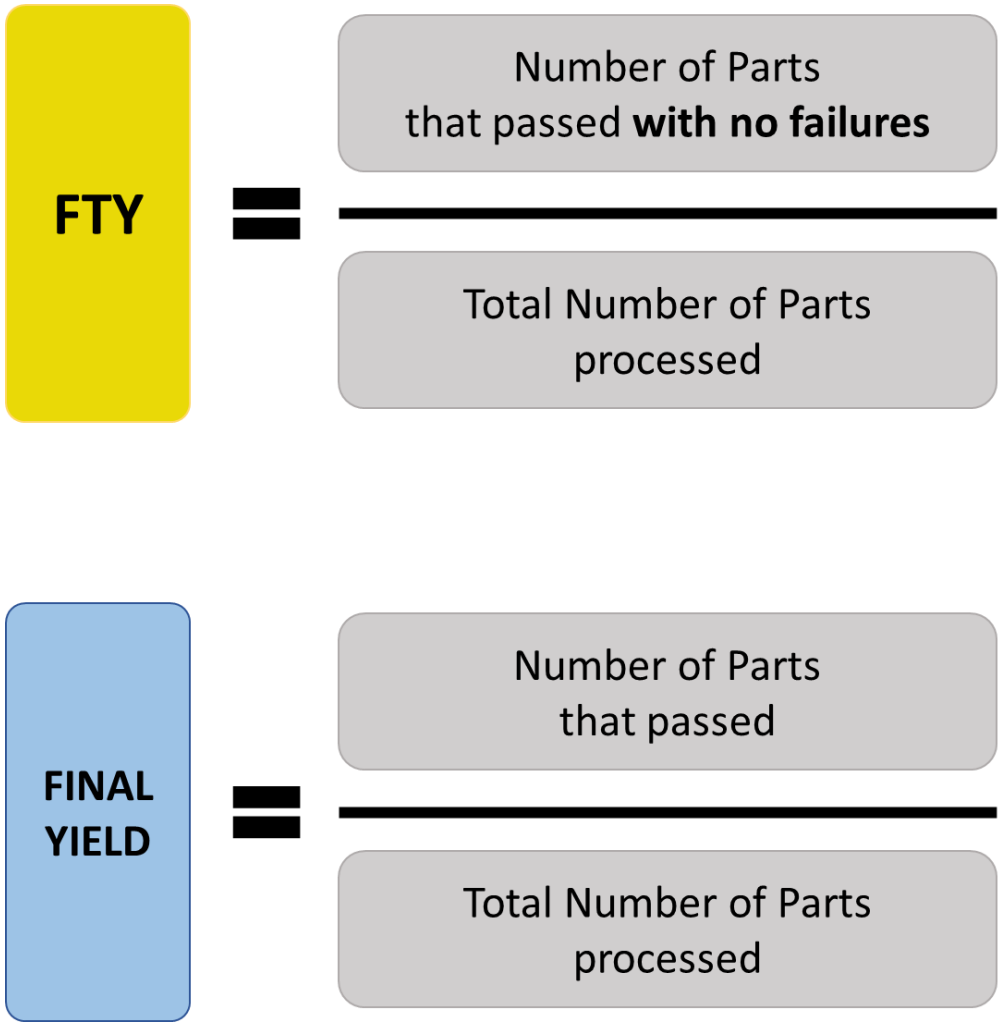
Therefore, practitioners must understand the strengths and weaknesses of various traditional metrics.

Metrics

First Pass Yield:

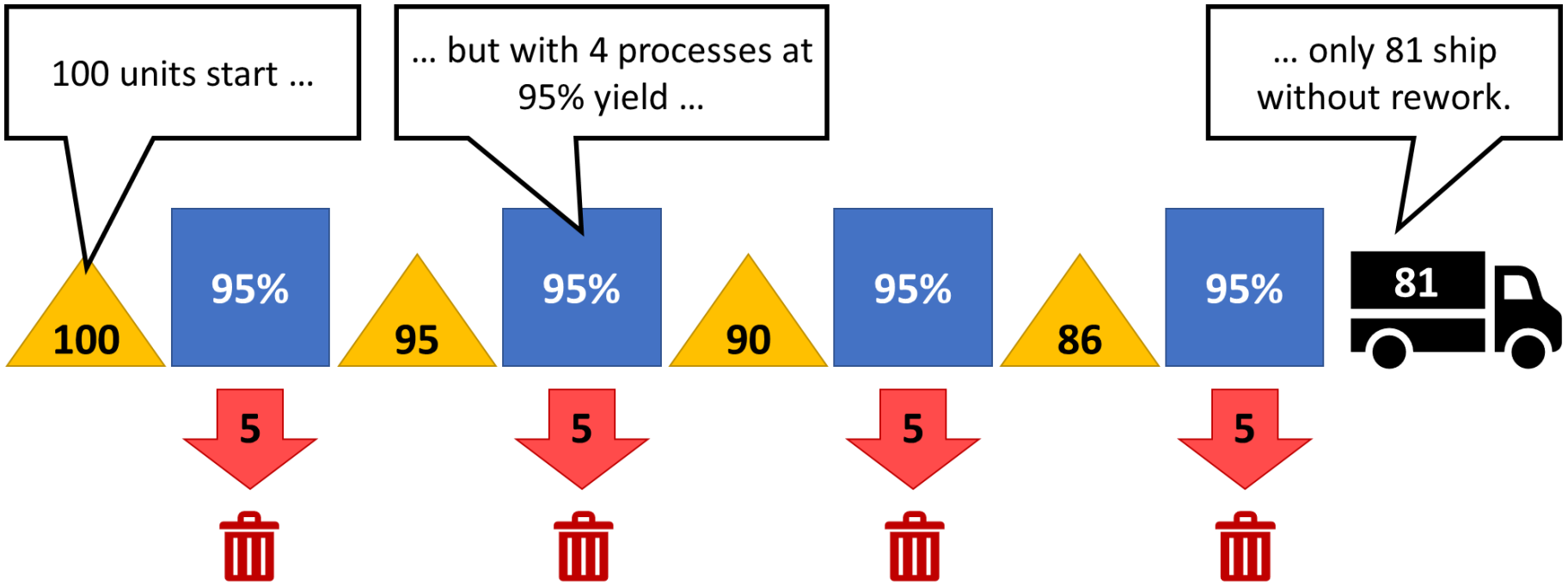
First time yield (FTY), also known as **first pass yield** (FPY), is the percentage of the time that a product or service **passes through a process step without any defects on the first attempt**.

First pass yield (FPY) is used to measure the level of rework. In the production flow, FPY is calculated for each operation (or step).



Metrics

First Pass Yield:



Metrics

Rolled Throughput Yield:

Rolled throughput yield (RTY) is the **probability of a product or service making it through the entire process without having a single defect**.

This is a valuable tool for opening the eyes of people regarding how defects are impacting a process.

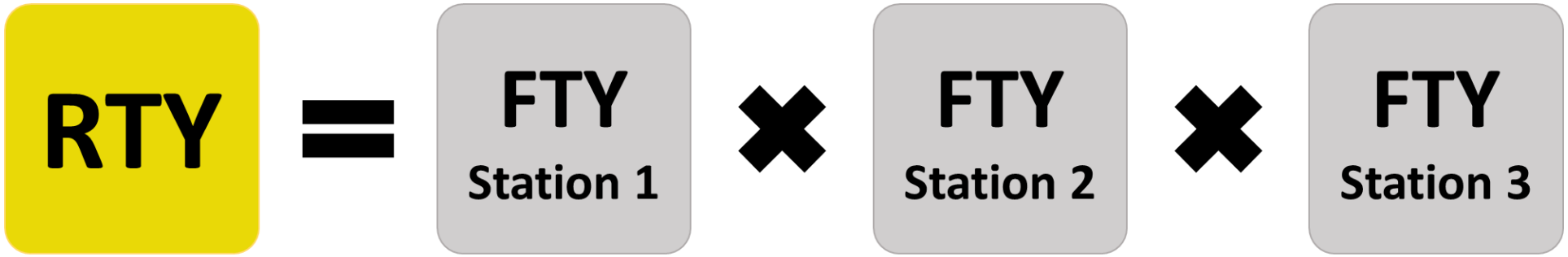
Many processes, especially when dealing with expensive product, will simply rework a product that exhibits failures until it passes, arriving at a total throughput yield of near or at 100%.

$$RTY = Yield\ 1\ x\ Yield\ 2\ x\ \ldots$$

$$Yield = \frac{Total\ \text{"passed"}\ products}{Total\ number\ of\ products}$$

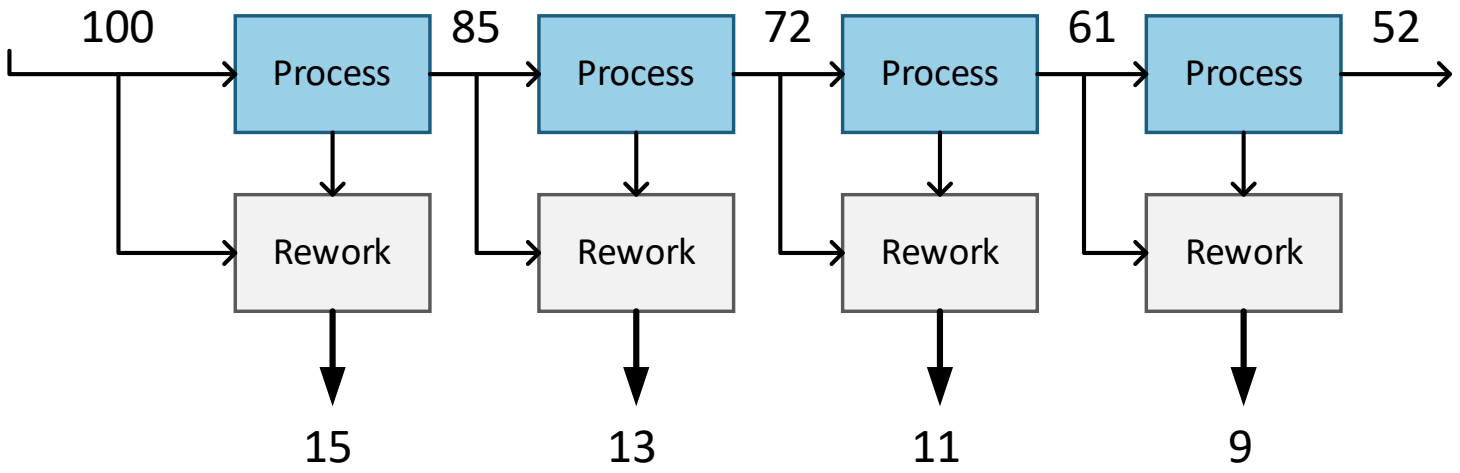
Metrics

Rolled Throughput Yield:



Metrics

Rolled Throughput Yield:



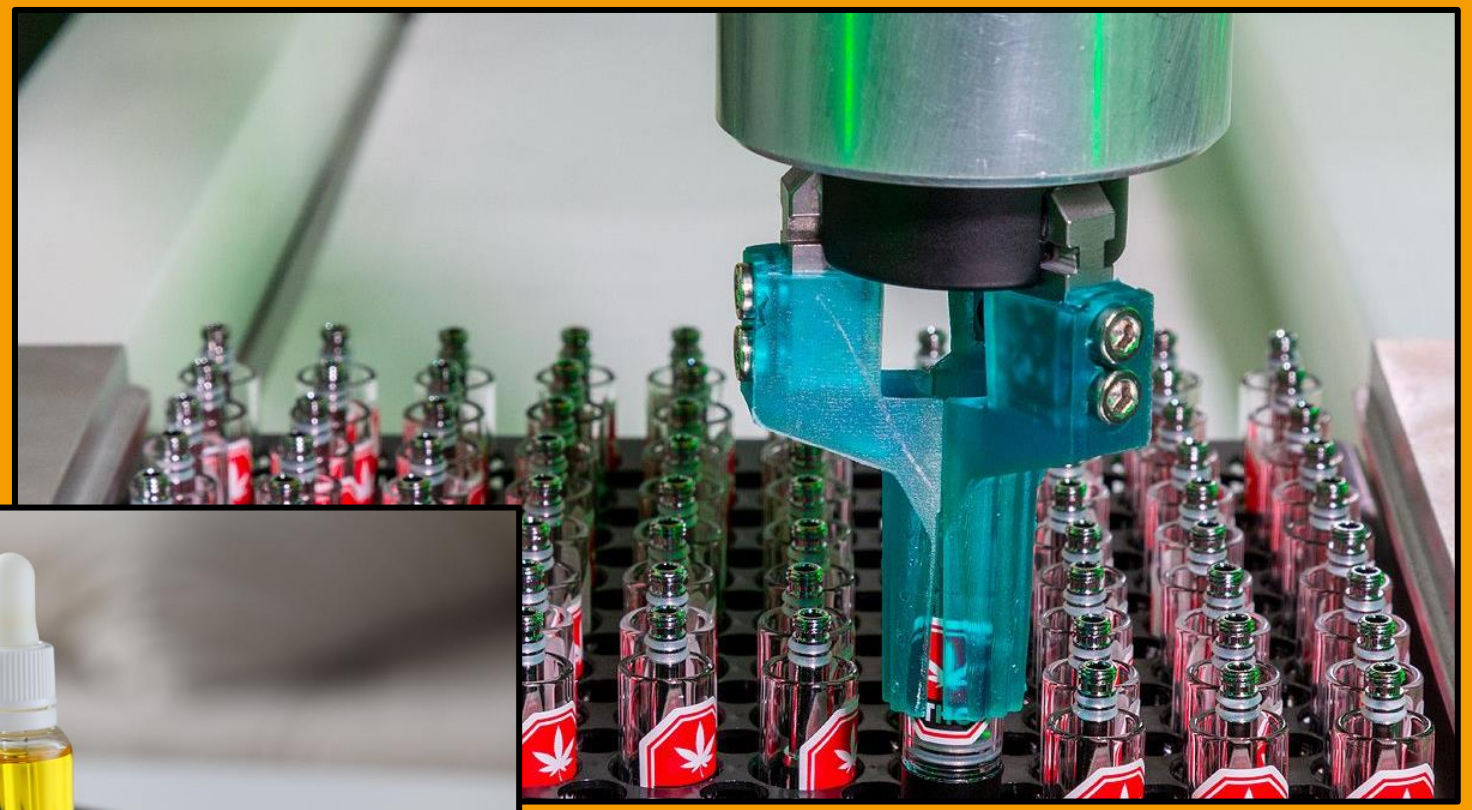
RTY = Yield 1 x Yield 2 x Yield 3 x Yield 4

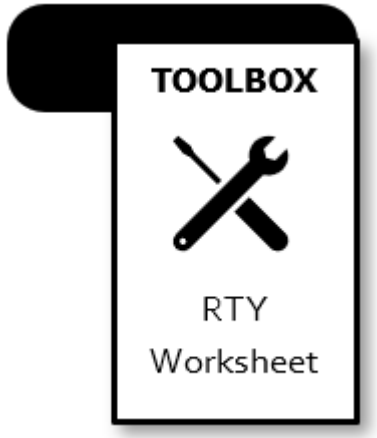
RTY = 0.85 x 0.85 x 0.85 x 0.85 = **52.2%**

LEARNING HUB

FTY

CannaV Inc





Rolled Throughput Yield - DPMO

Opportunities	2
Defects	237
Units	1,225

DPMO	Sigma
697000	0.98
697000	0.98
308733	2.00
66803	3.00
6210	4.00
233	5.00
3.4	6.00

DPMO	96,735
% Defects	9.67
% Yield	90.33
Sigma	2.80
Zst	1.30
DPMU	193,469
Cp	0.93

Process Step	Defects	Units	Opportunities per Unit	Total Opportunities	Defects Per Unit	First Pass Yield	Defects Per Opportunity	Defects Per Million Opportunities (DPMO)	Throughput Yield	Rolled Throughput Yield
Step 1	21	327	92	30,084	0.064	0.936	0.001	698.045	0.938	0.938
Step 2	15	271	92	24,932	0.055	0.945	0.001	601.636	0.946	0.887
Step 3									1.000	0.887
Step 4									1.000	0.887
Step 5									1.000	0.887
Step 6									1.000	0.887
Step 7									1.000	0.887
Step 8									1.000	0.887
Step 9									1.000	0.887
Totals	36			55,016		0.884	0.001	654.355	0.887	0.887

Takeaways

- The RTY is a great way to show how rework is affecting the production line or office processes.
- When used with other yield values, it can help give a more complete picture of how poor quality affects the day-to-day operation.
- An average RTY also is helpful but may be misleading. Adding or removing steps to the flow could have a significant impact, either positively or negatively, on the overall average.

Takeaways

- Whenever possible, use Rolled Throughput Yield (RTY) instead of using First Pass Yield (FPY).
- FPY and RTY are not only raw statistics that can be used in production but also a major input for process improvement, while they give you the key processes you have to concentrate on.

Thank You

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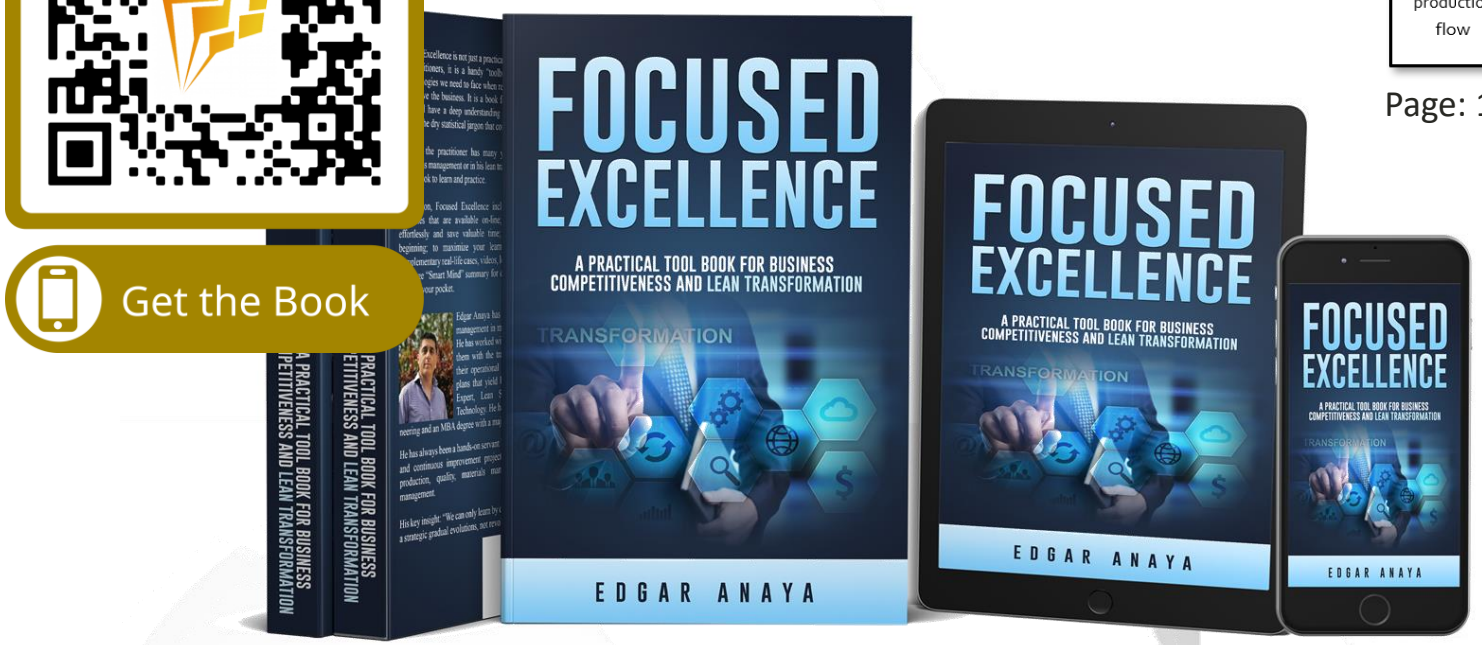
Get the Book



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Reference: Focused Excellence
by Edgar Anaya

A Practical Tool Book for
Business Competitiveness and
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