

Challenges in Manufacturing/Quality Control and Detection of Faults in Chain of Manufacturing by Multivariate Analysis. (Principle Component Analysis)

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Outline

- 1 Why do we look at challenges of Manufacturing?
- 2 Challenges in Manufacturing and Quality Control
 - Size
 - Orientation
 - Tolerance
 - Time
- 3 Second Main Section
 - Another Subsection



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Introduction

Why do we look at challenges in Manufacturing?

- Important to check the sanity of the production.
- Is it producing what it is supposed to be producing?
- Are the analytics used in the decision making any sense?
Eg: Confusion matrix.
- What are the cost associated w.r.t. metrology used?
Eg: Time, Complexity and Design.



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Size

Eg: Fasteners, Sub-parts, etc.

- Item in production line must be of same/specified size.



Size

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- Item in production line must be of same/specified size.
- Whole point (!) of production (Custom or Mass).

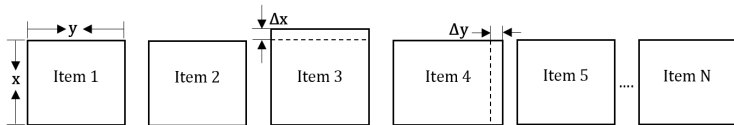


Figure: Production line in which item no.3 & 4 are oversized by Δx & Δy units respectively.

Orientation

Eg: PCBs, Masks, Sub-parts etc.

- Similarly, item in production line must be of same/specific orientation.
- Or no anomaly in the expected orientation.

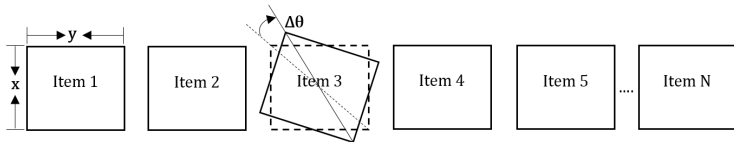


Figure: Anomaly in the production of item no. 3. The item is rotated by an angle of $\Delta\theta^\circ$.

Tolerance

- Needed for better judgement of quality of product.
- The errors occurred in measuring the parameters are due to actual physical error or analytical methods used or could be due to vibrations.
- It is important to know the source of error to precisely measure the parameters.

Time

Eg: Sorting in industries

- Very crucial when the throughput is of importance.
- The decision making analytical methods must have low (or no) complexity.
- Linear models are preferable.



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Blocks

Block Title

You can also highlight sections of your presentation in a block, with it's own title

Theorem

There are separate environments for theorems, examples, definitions and proofs.

Example

Here is an example of an example block.

Summary

- The **first main message** of your talk in one or two lines.
- The **second main message** of your talk in one or two lines.
- Perhaps a **third message**, but not more than that.
- Outlook
 - Something you haven't solved.
 - Something else you haven't solved.



For Further Reading I



A. Author.

Handbook of Everything.

Some Press, 1990.



S. Someone.

On this and that.

Journal of This and That, 2(1):50–100, 2000.