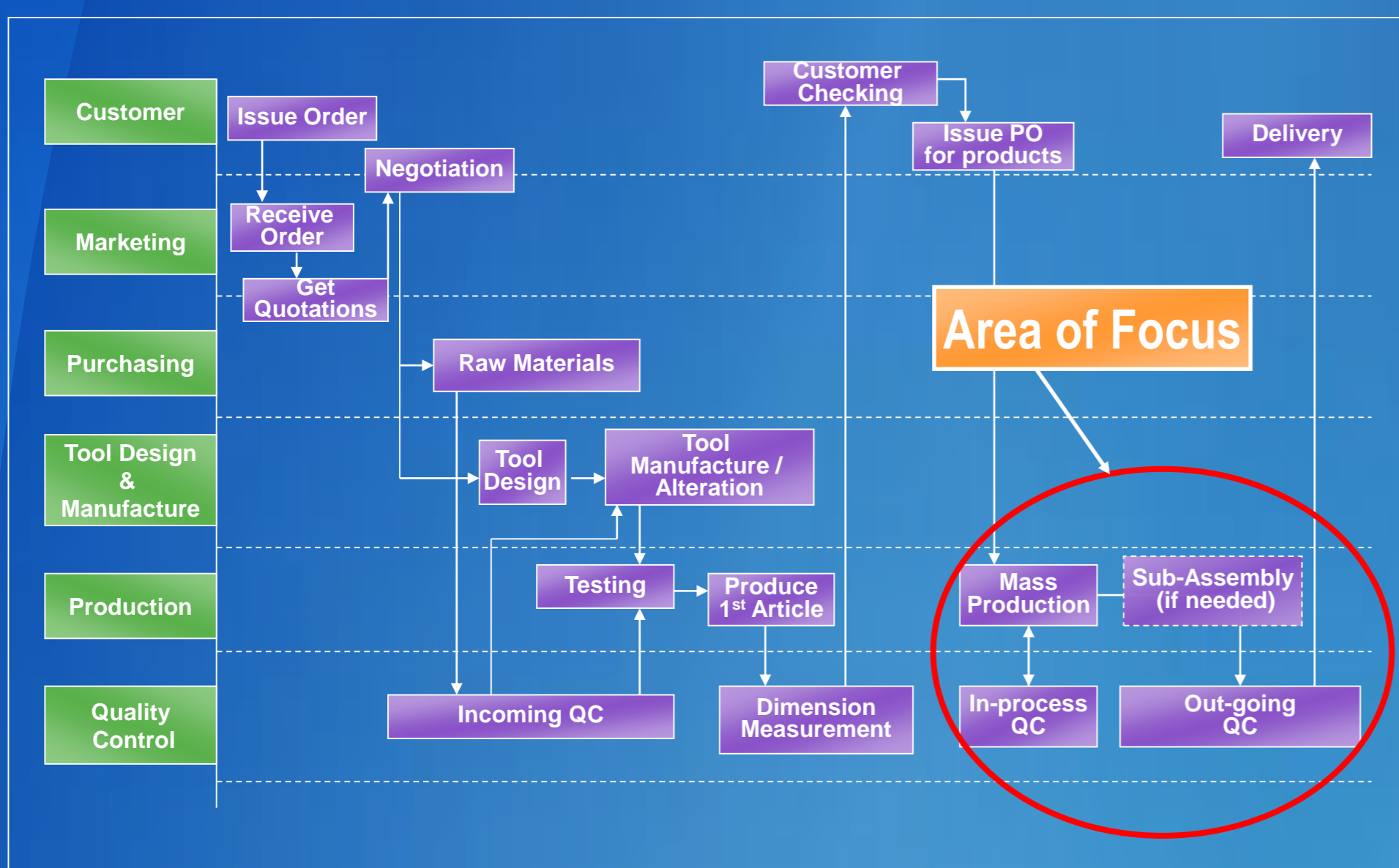


## Introduction

The client is a leading precision engineering designer and manufacturer for plastic mould tooling. Its nature of production is high mix and low volume. The following flowchart is the process mapping of their production and quality control process. This project is focused on mass production and quality control aspects.



## Problem Definition & Objectives

Problem definition:

- Inefficient information management
  - Omission of important details in data recording
  - Improper substantiation of defects
  - Difficulty in data storage and retrieval
- Lack of effective production monitoring system
  - Production trends and anomalies are not captured
  - Insufficient sample size during In-Process Quality Control
  - Overlapping of responsibilities between In-Process and Outgoing Quality Control processes
- Unsystematic identification and verification of sources of errors
  - Conjecturing sources of errors
  - Incomplete verification of sources of errors

Objective:

Present and implement a holistic production framework which covers information management, real-time production monitoring and systematic problem-solving methodology.

## Production Framework & Performance Measure

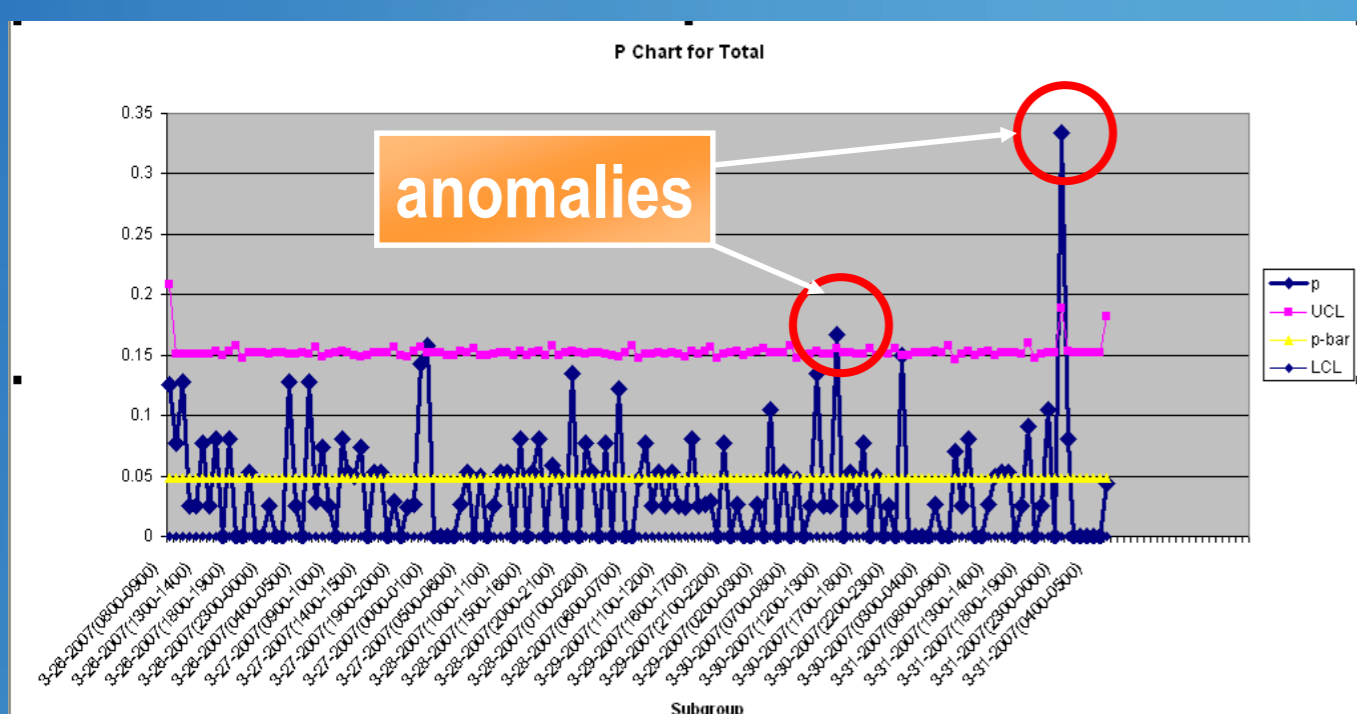
The production framework includes a set of strategies and methods for the entire production process applicable to any product. It contains the following five parts:

### 1. Data collection framework

- No limitation on type of defects that can be added
- Allow automatic statistical calculations

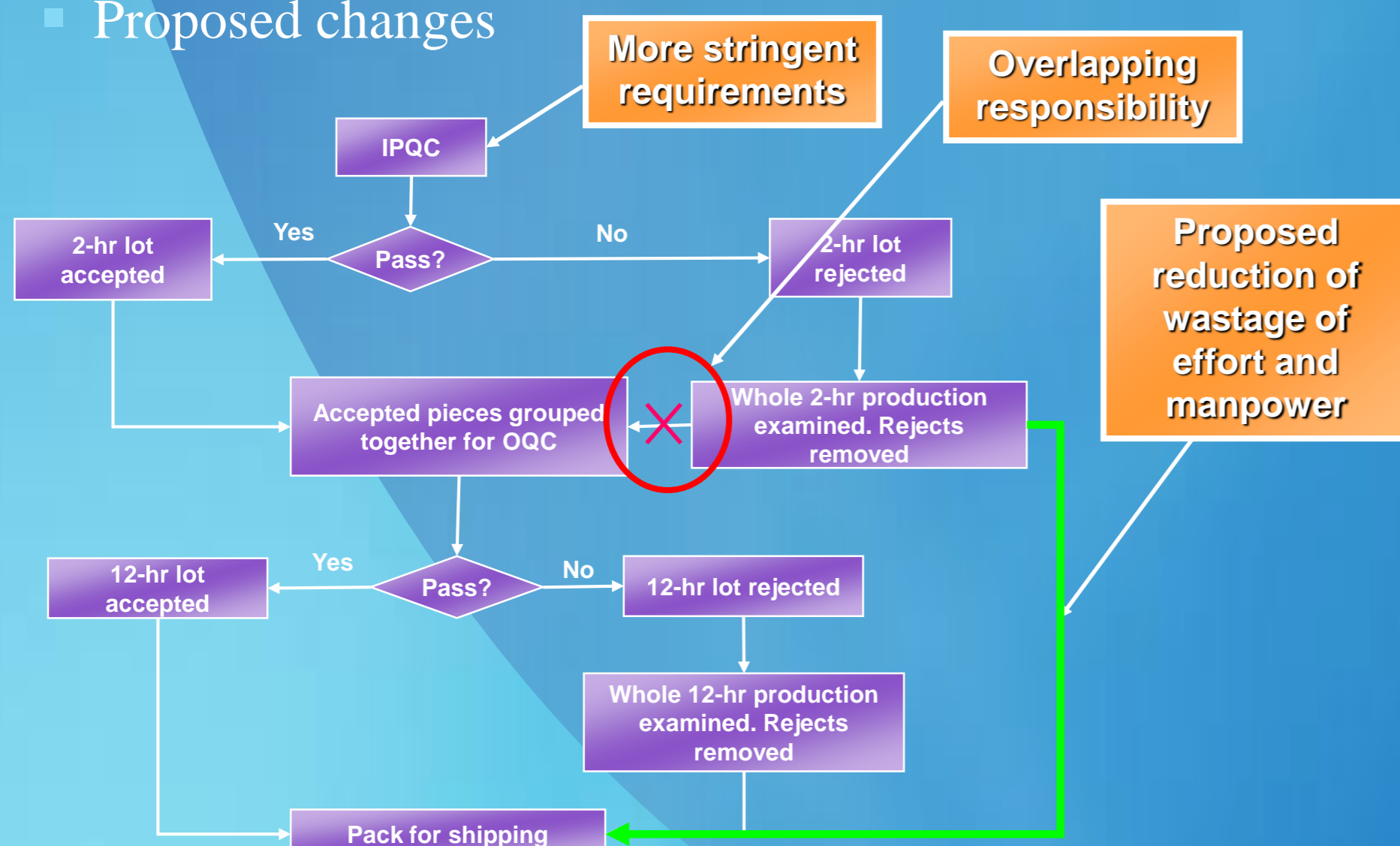
### 2. Real-time monitoring chart

- Alert the staff of production trends and anomalies



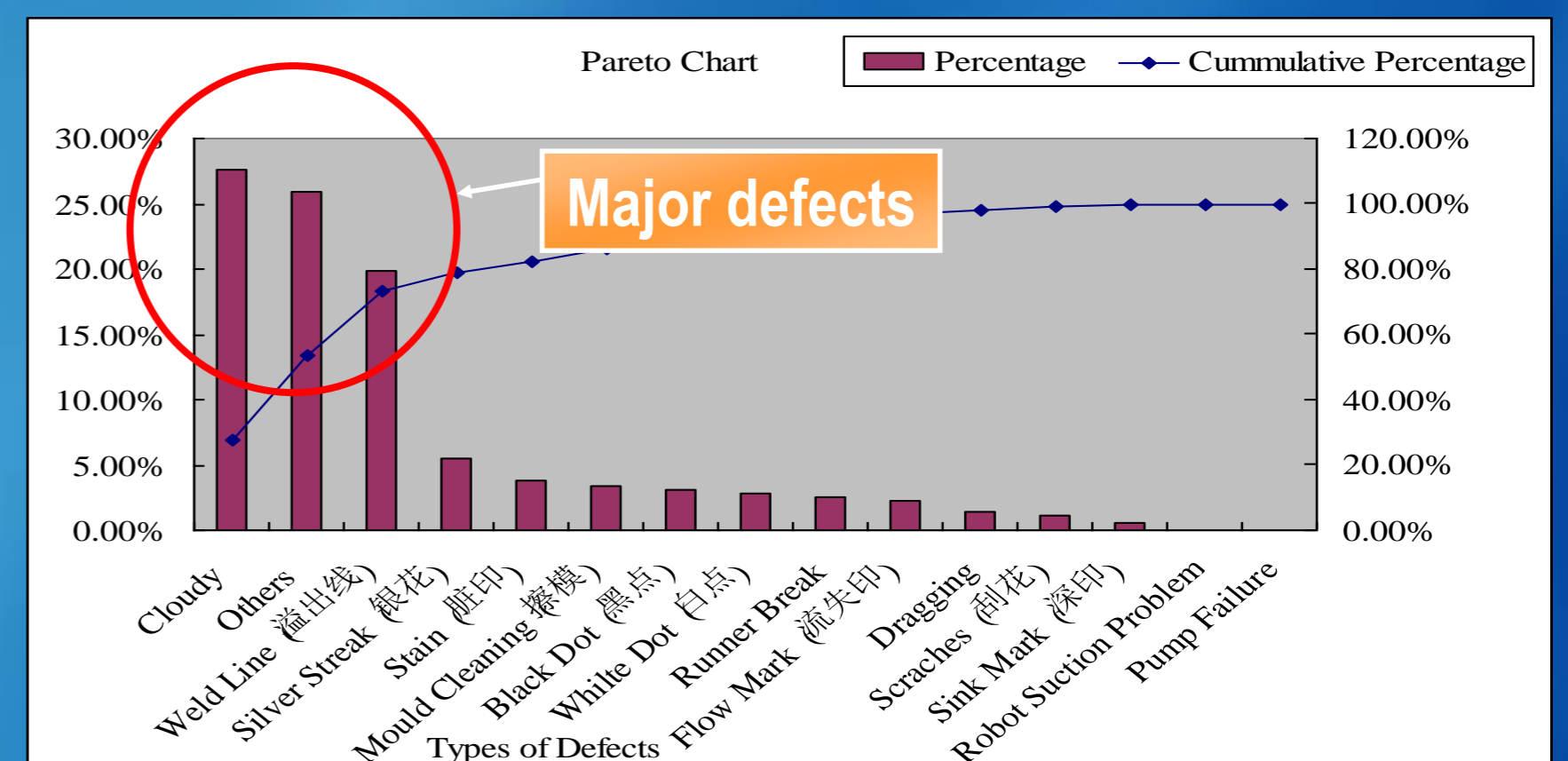
### 3. In-Process Quality Control (IPQC) and Outgoing Quality Control (OQC)

#### Proposed changes



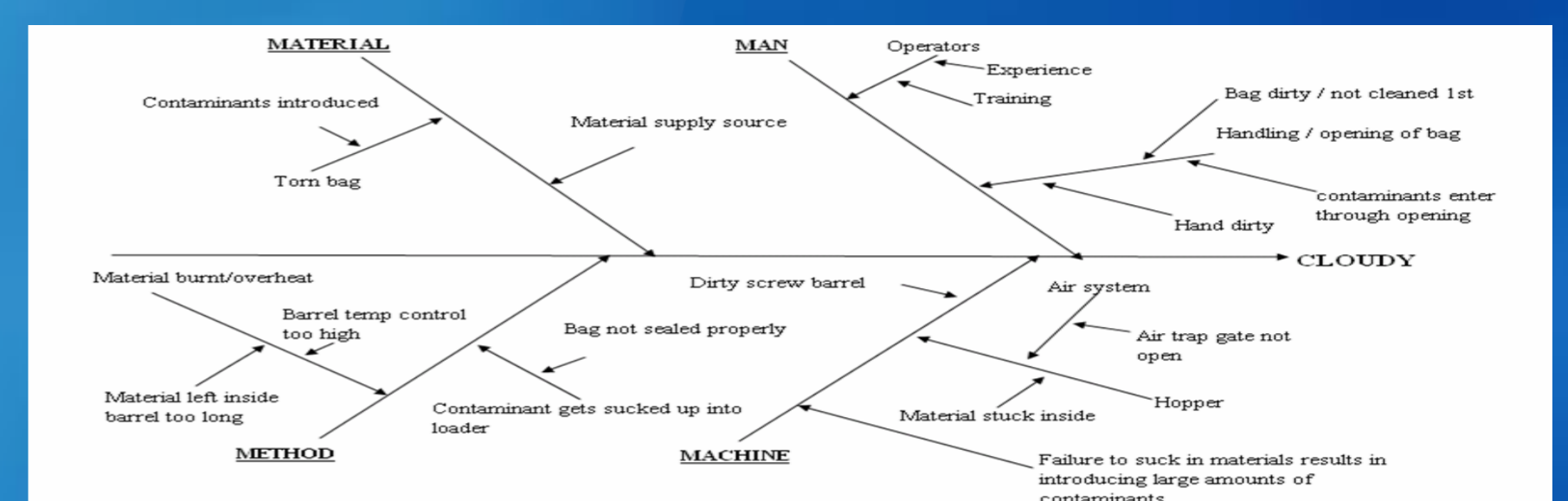
### 4. Pareto chart

- Give summary statistics and identify major types of defects



### 5. Systematic Problem-solving Principles (DMAIC)

- Define: Clear definition of problems in operational items
- Measure: Identify/decide key indicators for measuring defects



- Analyze: Undertake controlled experiments to verify causes
- Improve: Identify creative solutions
- Control: Ensure that key indicators remain within the range

Deliverables and Achievements:

- Reduction of production defect rate from 15-20% to 3-5%
- Transfer of necessary knowledge on problem-solving principles through a case study
- A customized and bilingual software package embedded in Excel for production monitoring