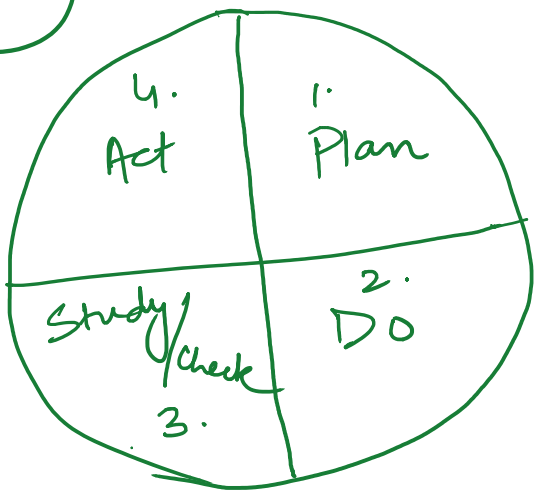
Deming wheel / PDCA cycle



Deming wheel / PDCA cycle is a four stage process for continuous quality improvement that complements Deming's 14 principle.

Deming approach to quality embodied in his 14 points & PDCA cycle are the foundation for today's Quality management system which is employed by many successful organisation.

Quality tools in QM

are 7 seven basic Quality tool

- flow chart
- cause & effect diagram (fish-bone diagram)
- check sheet
- Pareto Analysis
- Histogram
- Scatter diagram
- Control charts

- flowchart :

↓

Process flowchart

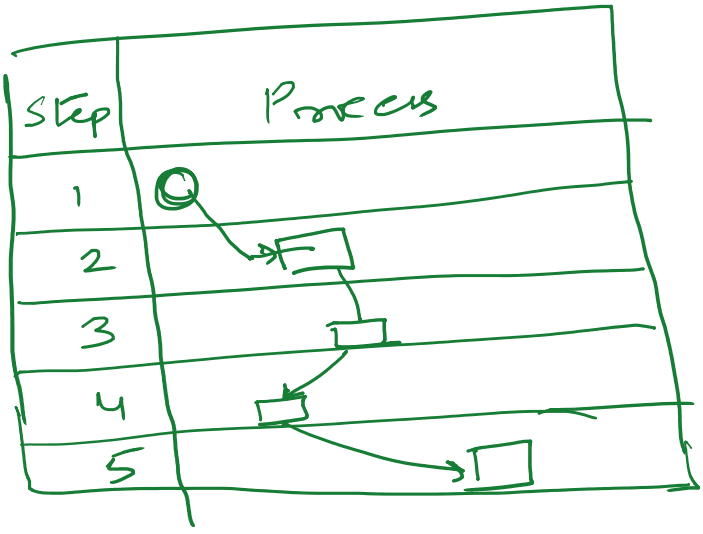
1. It is a schematic diagram of the steps or activities or task involved to complete a job.

2. It follow a series of sequence in flow charts.

3. It enables everyone in the organization involved in identifying & solving quality problem to have clear picture of how a specific operation works.

4. It enables a process improvement team to understand the inter-relationship of departments & function that constitute a process.

5. Development of flowchart can help in identifying quality problems by helping the problem solver to better understand the process.



(9) Cause & Effect diagram

(2) Cause & Effect diagram.
(Ishikawa's diagram)
(fish & bone diagram)

Cause & effect diagram

1. It is graphical representation / description of the elements of a specific quality problem & the relationship between those element.
2. It is used to identify the quality problem reasons & so it can be corrected.
3. This tool usually developed as a part of brain storming process to help team mates or quality teams to identify the cause of problem.

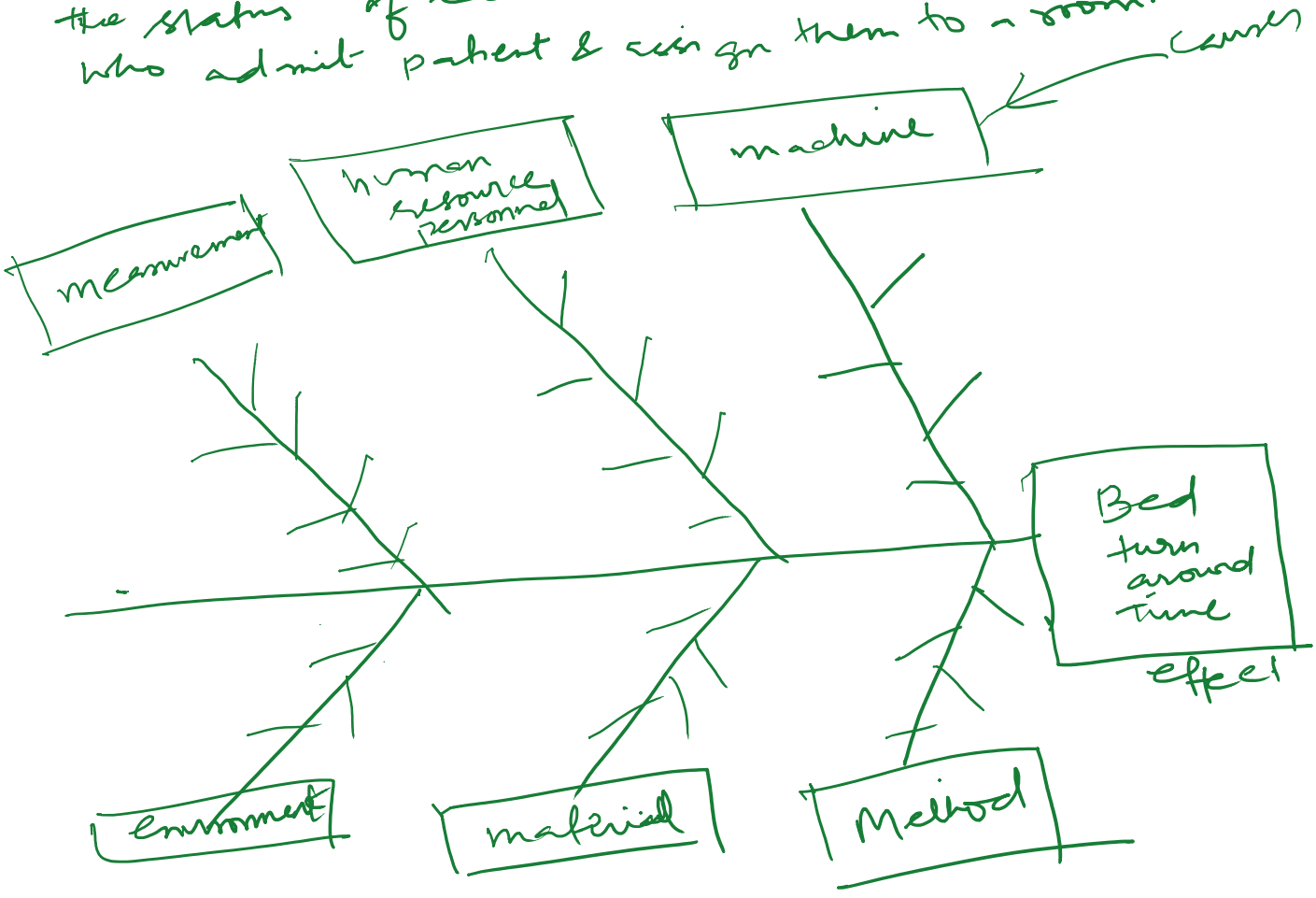
The hospital wants to reduce delay in patient bed turnaround time, which creates patient flow problem through out the hospital

↓

Hospital Management identify the primary cause of the problem is suspected to (bed Tracking system) BTS.

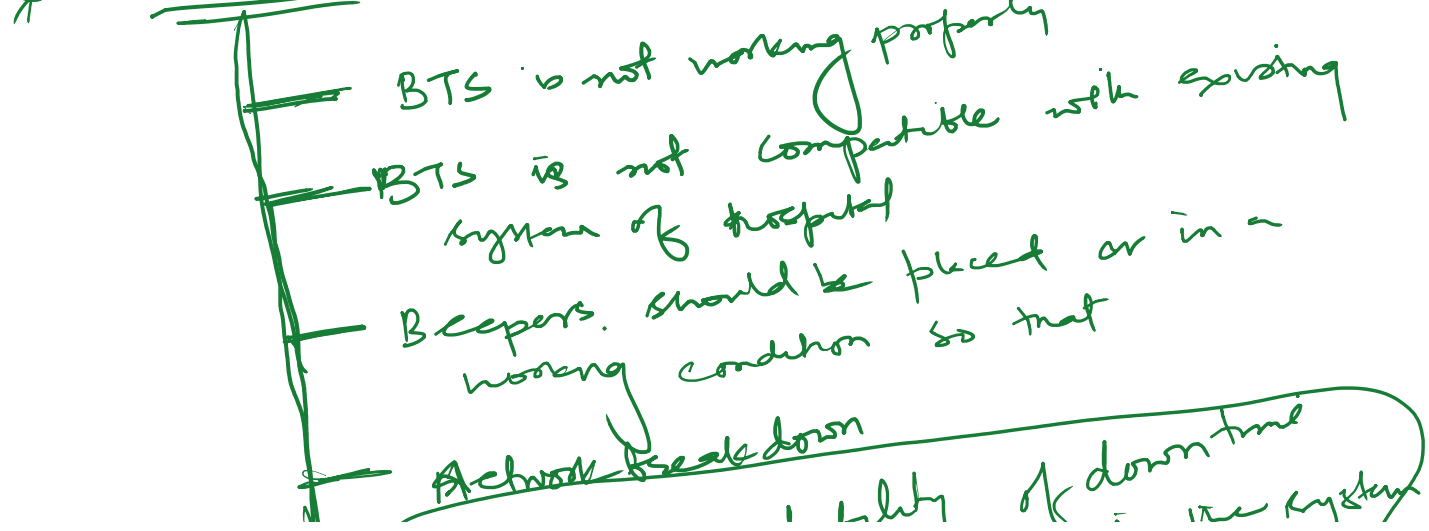
to be related to (bed Tracking system) is.

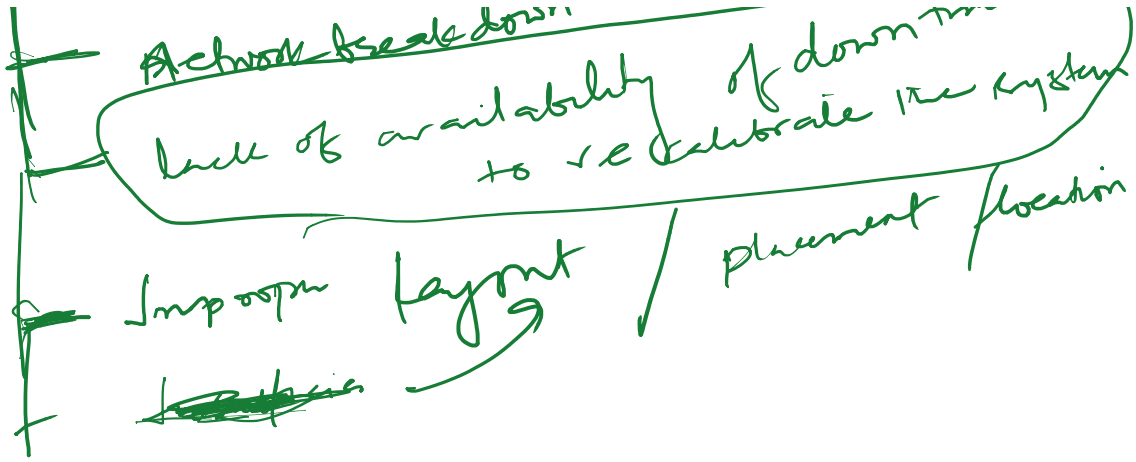
BTS - it is a electronic system that indicate the status of each bed to the registered nurse who admit patient & assign them to a room.



Causes

* Machine





2. Personnel / Human resource Causes

- lack of staff
- Lack of staff training
- Behaviour or attitudinal issue.
- Delay of information
- lack of expertise to handle/manage
- Delay of in preparation of bed for new patient.
- over utilized / under utilized
- [redacted] are not available on time.

3. Measurements

- lack of book keeping records. by registered nurse
- [redacted]

- No record of actual time of discharge or time on which the particular patient should discharge.

4. Environment (Cause) Bad planning

- Volume of bed (shortage) lack of inventory
- Supplies are not delivered on time.
- lack of supplies of equipment/material
- Cost of equipment
- location
- market demand / uncertain demand
- Regulation:
  - External conditional support patient depends

5. Material Causes

- laundry
- Sanitizer
- lack of house keeping supplies
  - Wheelchair

- [illegible]
- Delay of pharmacy.

6. Method (Cause)

- Standard operating procedure (R-C formula)
- Communication
- Method of preparation of bed
- Training & development
- version update.
- Roaster for staff.
- Instead of manual use of robotics in treatments/OPs.

3. Checksheet (Quality tool)

- Checksheet tells us about a problem and its occurrence. (frequency of occurrence)

[illegible] through checksheets are [illegible] diagram

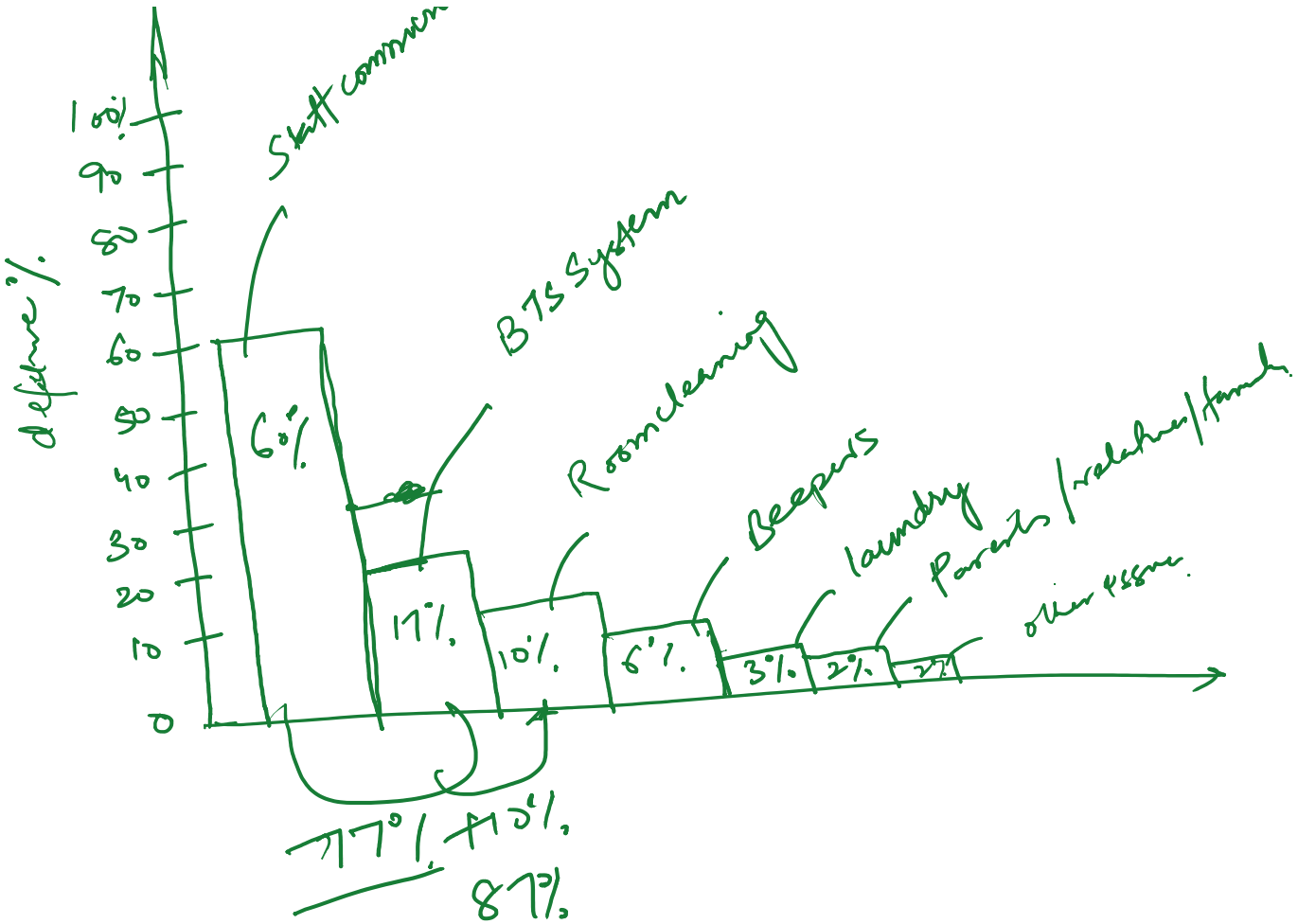
often used for generating pareto

- checksheets are also referred to as tally sheet ~~sheet~~ that are used to collect useful data about a problem or its attributes when performing audit or inspection.

Defect type	Mon	Tue	Wednesday	Thurs	Friday	Sat	Total
Supplied part rusted	|||||||	—	|||	||	—	||	14
Misaligned weld	—	—	||||	||	—	—	06

Pareto diagram

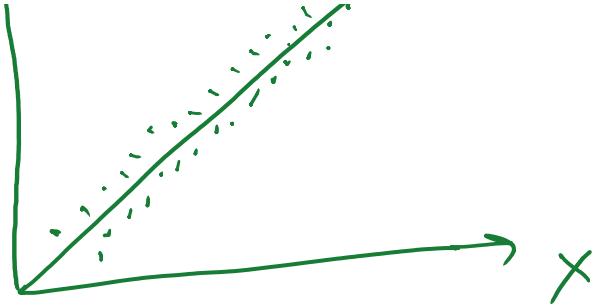
80% / 20%



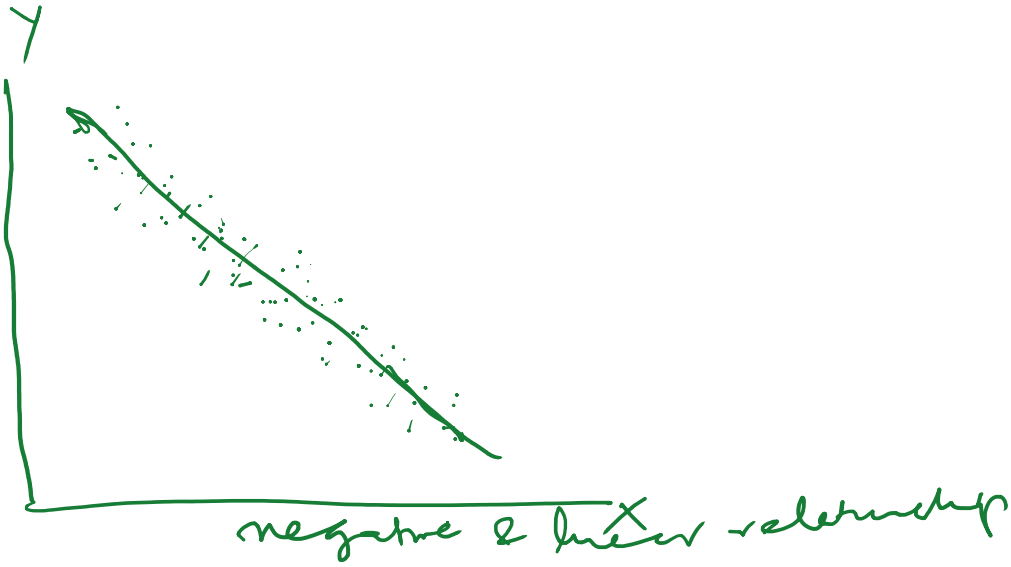
Cause of poor quality

Scatter diagram

- Scatter diagram is used to check for correlation b/w two variable



positive & linear relation

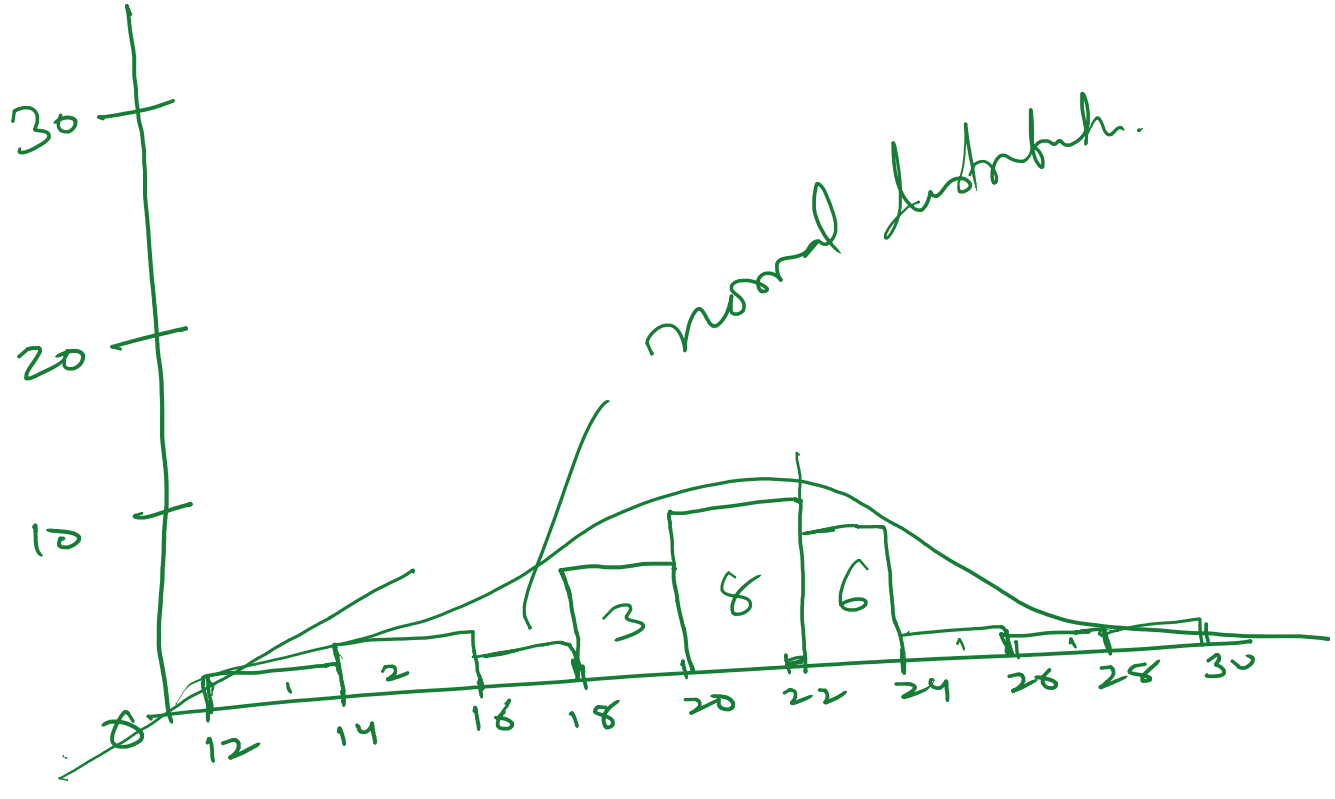


Histogram

Histograms are special type of bars chart that show central tendency, dispersion & shape of statistical distribution.

Set of measurement

21.2 20.3 19.9 ✓
21.4 18.1 ✓
14.2 12.2
20.7
19.3



8. Control charts:

Control charts are used to know whether a process is stable or has the desired performance. Control chart are used for repetitive process

for eg: mfg.

Rule 1.: establish the Upper limit

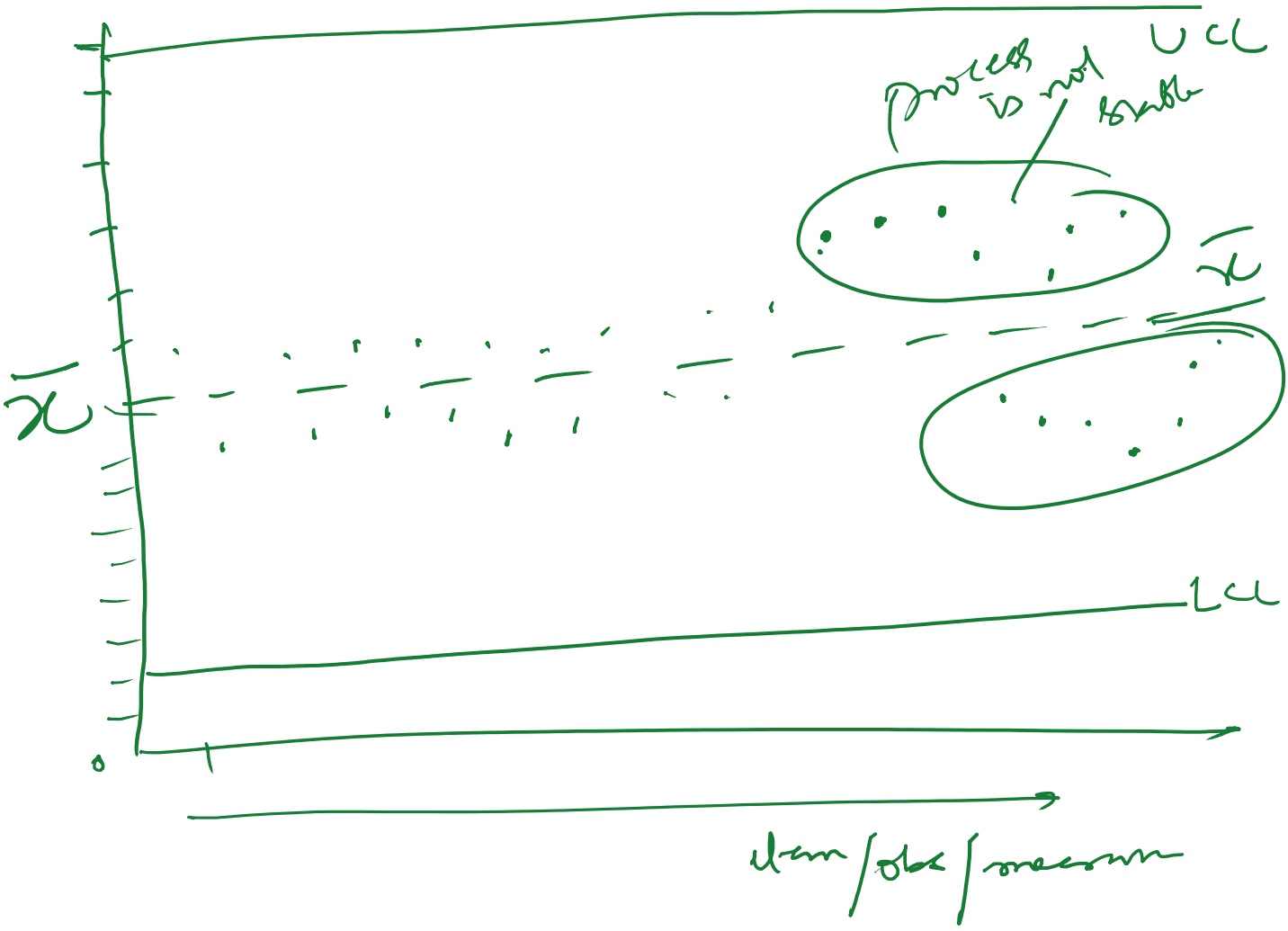
Rule 2.: Slly establish the lower limit

Rule 3.: out of control observation

Rule 4: Rule of seven: out of control if 7 observation or measurement are above mean or below the mean.

Rule 5: specification limit: is a print determined by customer, not calculated based on control chart.

Rule 6: Normal & unexpected variation usually we take 3 or 6 sigma


UCL
process is not stable
$\bar{x}$
$\bar{\bar{x}}$
LCL
0
item/shot/sample