LSSH
lean six sigma for healthcare

Visualisation of data

U4 – Measure

E2 – Statistics

The element ‘Statistics’ reviews the basics of statistics such as mean, deviation and probability. This element reviews a range of graphs that can be used to visualize data as well.

Lifelong Learning Programme

Yellow Belt

Visualisation of Data

Graphical analysis

- **Graphs visualise the data**
- **Graphs help to understand the nature of variation**
- **Graphs help to separate signal from noise**

Visualisation of Data

Pareto chart

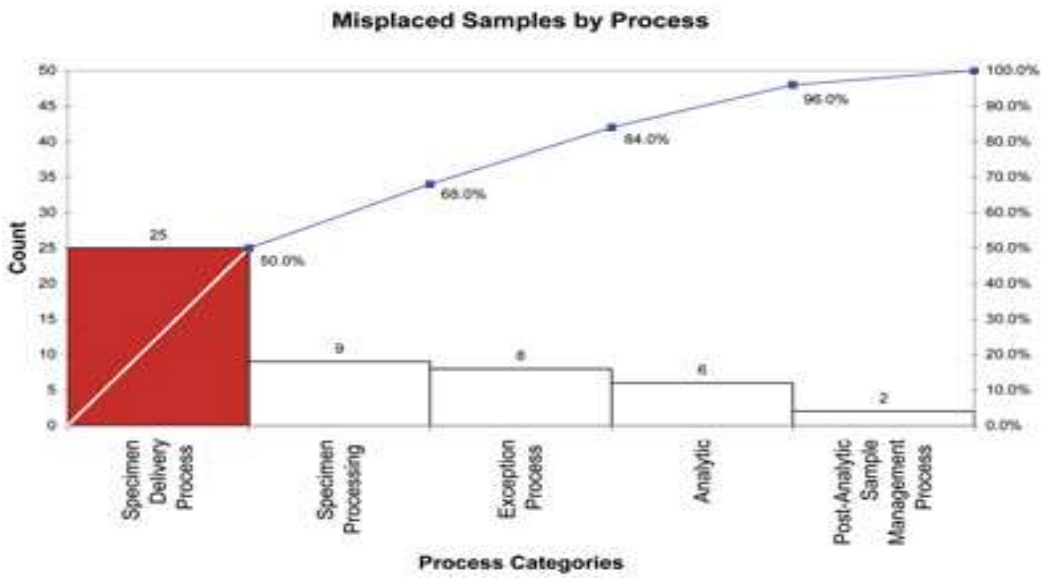
A Pareto chart is a type of bar chart with:

- A horizontal axis that represents the relevant categories (usually defects or errors)
- Bars that are ordered from largest to smallest value to identify the “obvious many“ and the “vital few”
- A cumulative percentage line that shows the cumulative contribution

80-20 rule

- 80% of the problems are caused by 20% of the factors

A Pareto chart can help us to focus!

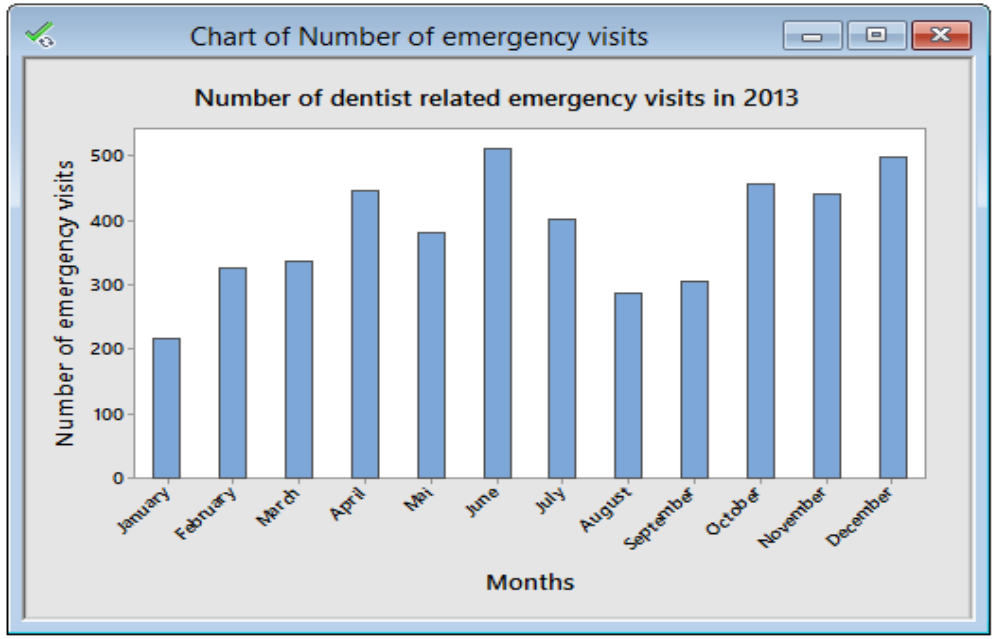


Visualisation of Data

Count results by category - Bar chart

- **Use a Bar chart or a Pie chart to graphically compare count results or frequencies for two or more groups**

Example: Bar chart of dentist related emergency department visits

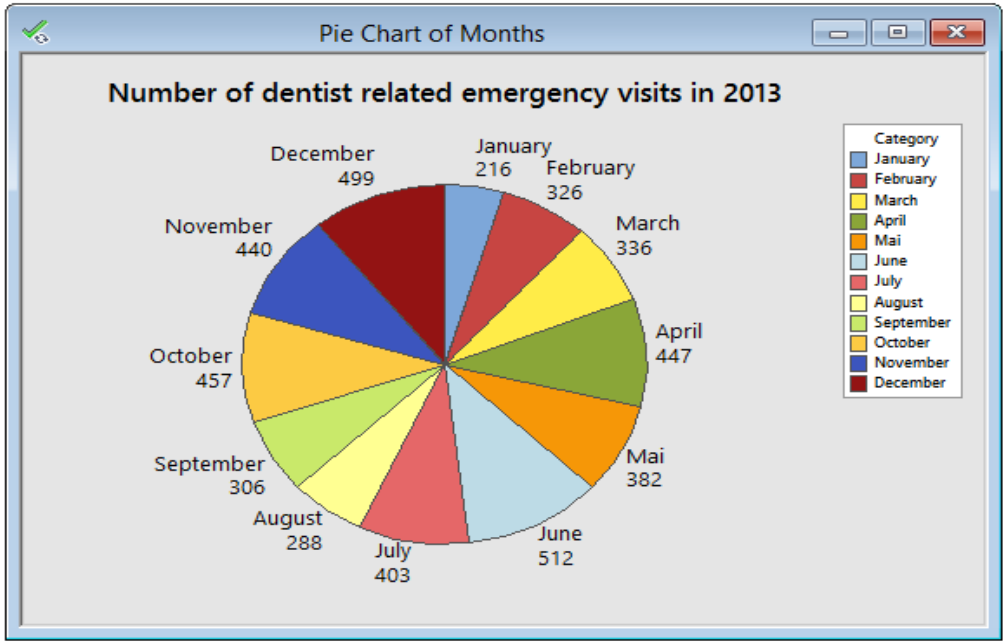


Visualisation of Data

Count results by category - Pie chart

- **Use a Bar chart or a Pie chart to graphically compare count results or frequencies for two or more groups**

Example: Pie chart of dentist related emergency department visits

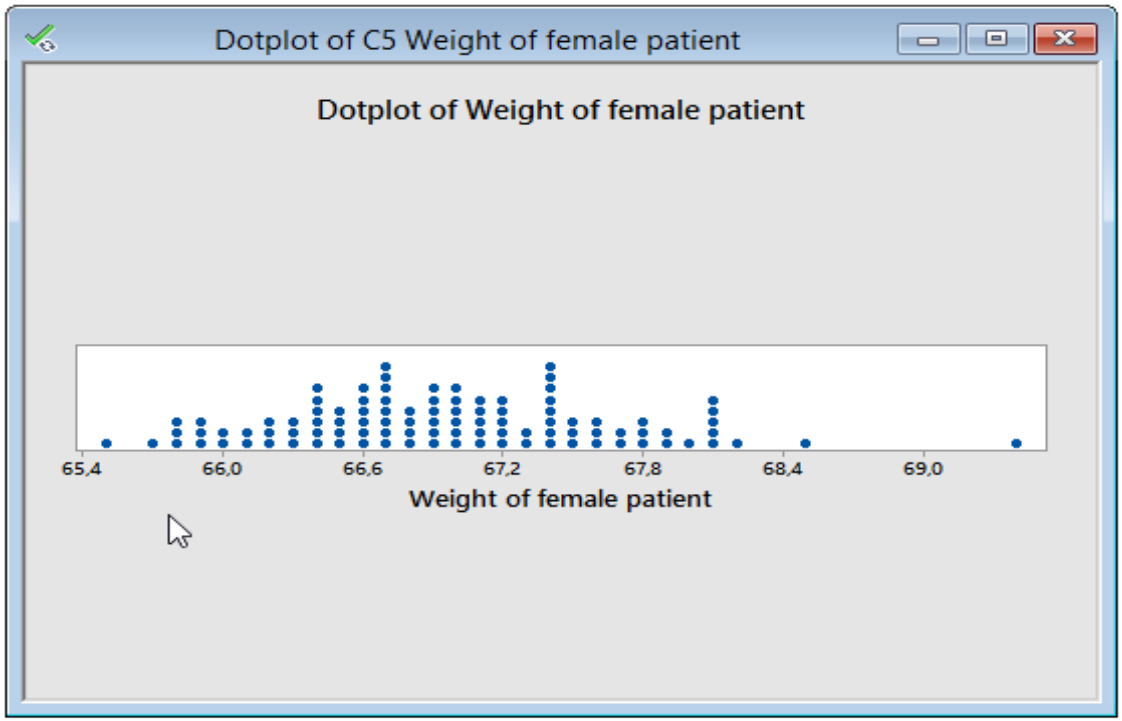


Visualisation of Data

Count results by interval - Dot plot

- **Visualises the distribution/dispersion of data**

Example: Dotplot of patient Weight

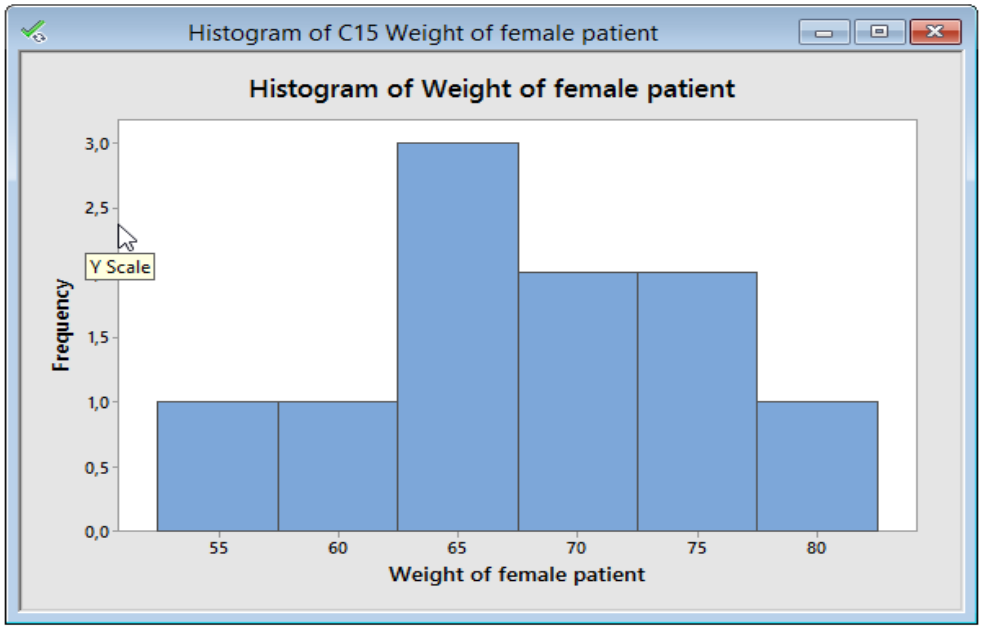


Visualisation of Data

Count results by interval - Histogram

- Visualises the distribution/dispersion of data
- Frequency: bars indicate the number of observations
- Density: bars indicate the percentage

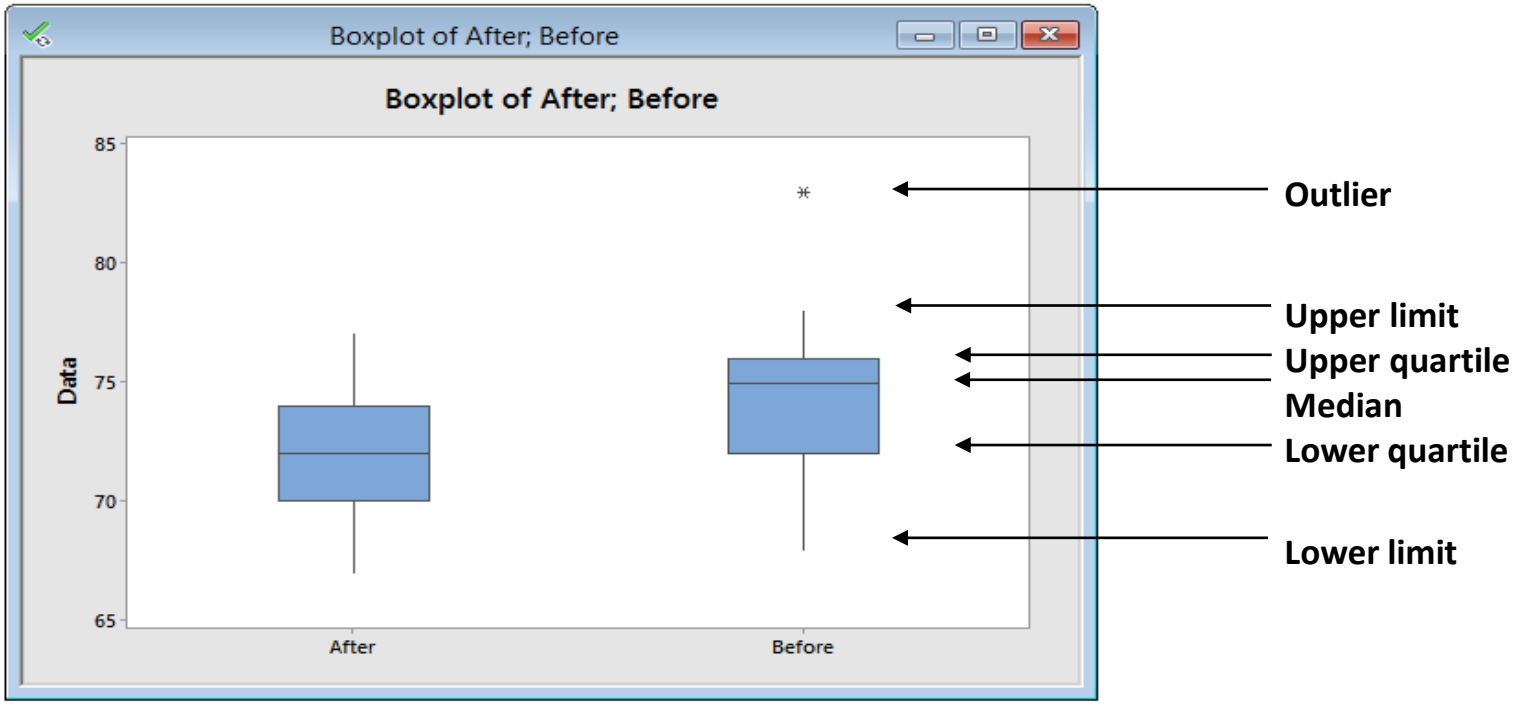
Example: Histogram of female patient weight



Visualisation of Data

Box plot

- **Use the Box plot (box-and-whisker plots) to visualise and compare data distributions**

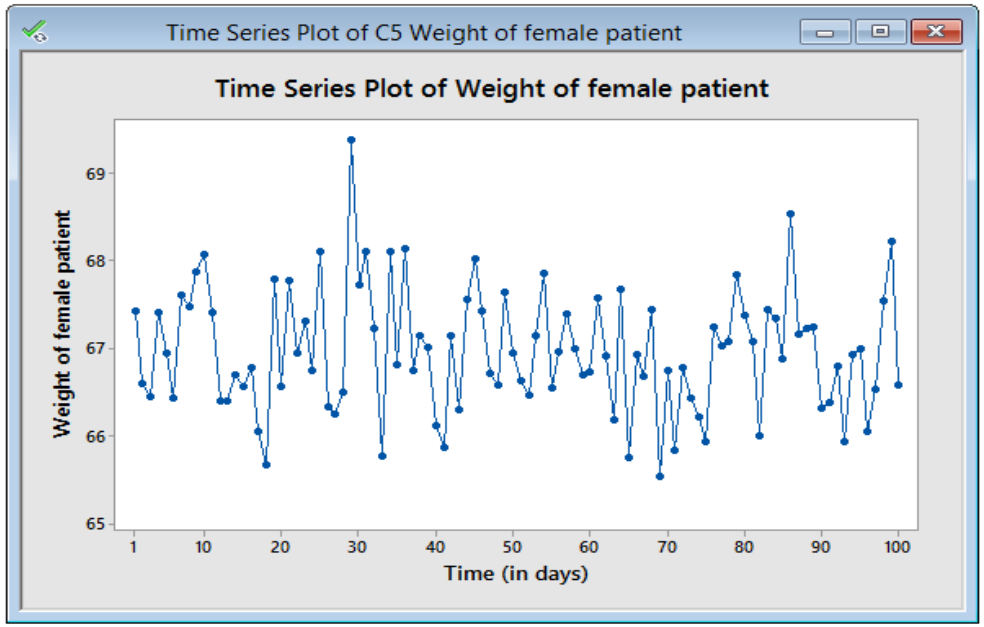


Visualisation of Data

Time series plot

- **Use the Time series plot to visualise and/ or discover patterns in time**
- **Usually one of the first graphs made to see if the behaviour is stable**

Example: Time series plot of patient body weight

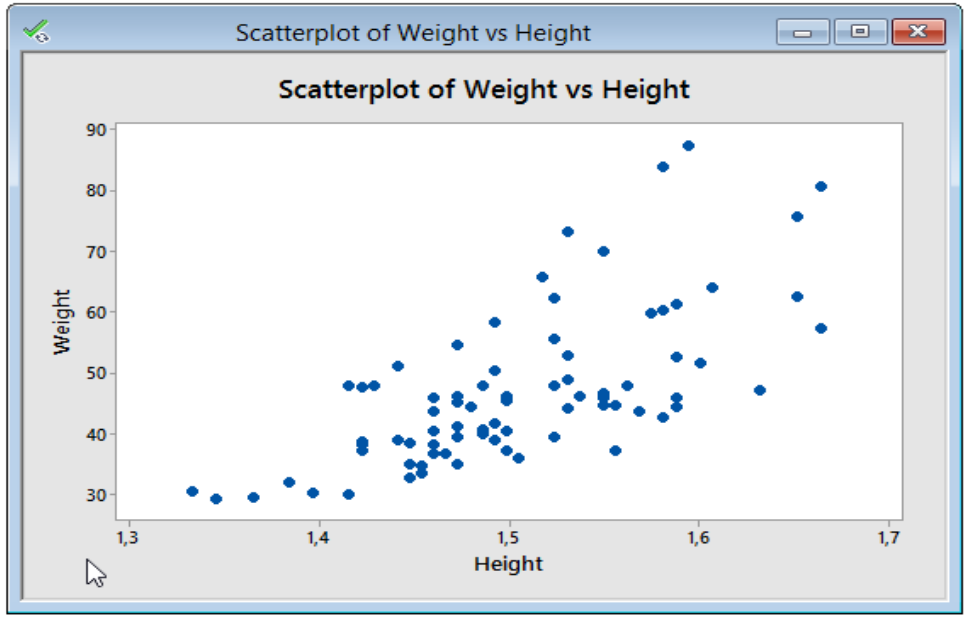


Visualisation of Data

Scatter Plot

- **Used to examine the relationship between two continuous variables by drawing them on separate axes**

Example: Scatter plot height and weight



Visualisation of Data

Check sheet

- **A simple way to collect and analyse data (how frequently something occurs)**
- **Indicates where problems occur - location, type, cause, etc.**

123RF Stock Photo

Visual management

- **Ideal tool for collaborating, achieving results and preventing problems**

- **Oversee situation quickly**
  - What are the results?
  - What goes well?
  - What goes wrong?
  - What has been done?
  - What needs to be done?
  - Are there delays?

Visual Management

Visual management is…

- Making visible (desired and undesired)
- Sharing information
- For a defined group of people
- Reinforcing cooperation
- About improvement, not about guilt
- Sense of ownership
- Clear and standardised working methods

Visual Management

Visual management includes

- An organised working environment (5S programs, Labelling, etc.)
- Visualise goals, targets and performance criteria (planning boards)
- Standardised and clear working instructions
- Control work in progress (Kanban)
- Autonomous maintenance
- Failure prevention (Poka Yoke)

Visual Management

Visual management basic principles

Providing information

- Which is related to a department
- Which can be influenced by the department

Initiating improvements

- Visualise goals and performances and discuss them
- Correct quickly deviations (PDCA)

Visual Management

Example of organised workplace (5S & labelling)

- **Orderliness and cleanliness provides insight and overview**

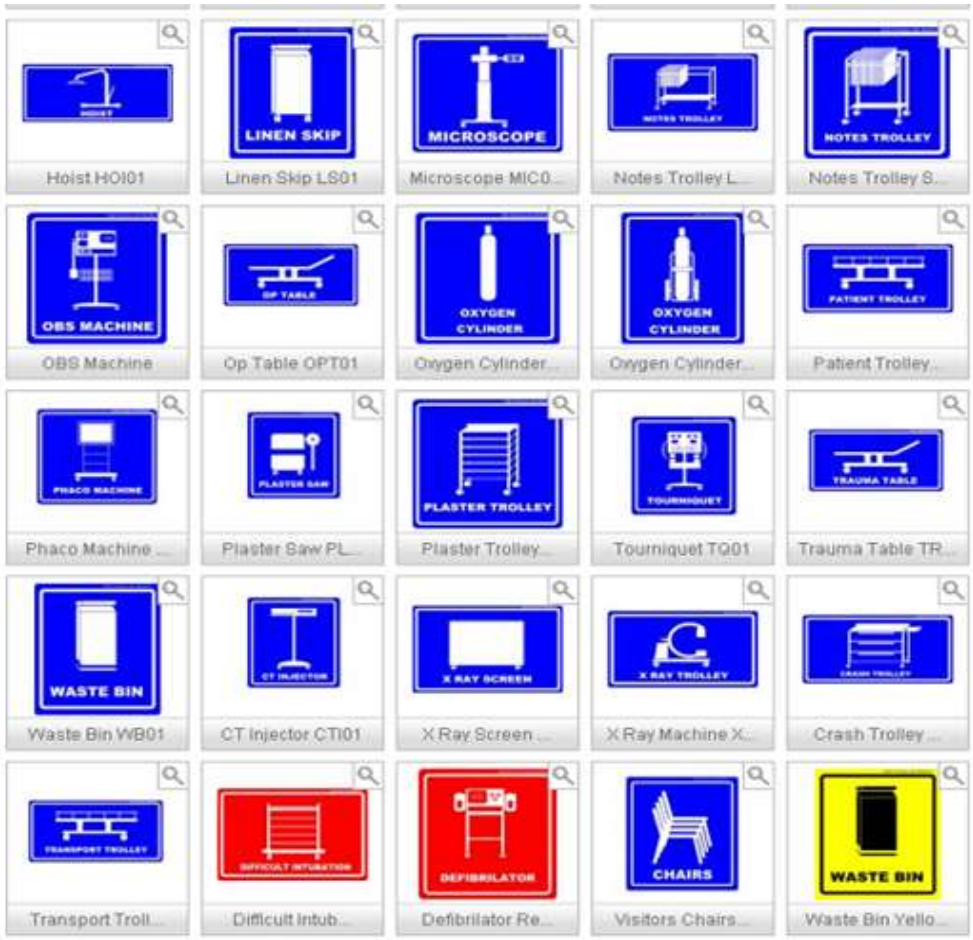
Visual Management

Examples of organised workplace (5S & labeling)

Visual Management

Example of Standardisation

- **Standard symbols**



Visual Management

Example of Employee skill matrix

- **Trained employees are essential for good quality**
- **Is sufficient expertise available for a specific process?**

	Revision Date: 7/5/2006										
	Symbol	Level									
	⊕	Can not perform the task									
	◔	Familiar with elements of the job									
	◑	Can perform with help									
	◕	Can perform solo									
	●	Can team others to perform									
		Accounting									
Process / Name	Bill Entry	Bill Pay	Invoicing	Receiving Payments	Credit Card Transactions	Reconciliations	Customer Account Entry	Expense Report Review	Expense Report Entry	Creating POs	Banking Deposits
Marcie	●	●	●	●	●	●	●	●	●	●	●
Michell	◔	◔	●	◕	◕	◔	●	◕	⊕	◔	●
	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕

Visual Management

Examples of Visualise performance

Visual Management

Example of Visualise improvement (PDCA)

- **Improvement board**

Visual Management

Examples of Visual flow

- **Every order is linked to a physical card (this is called ‘Kanban’ or ‘Tag’)**

- **Medications in two bin with FIFO (first in first out) organization**