An Example Of Visual Six Sigma, with JMP® Scripting
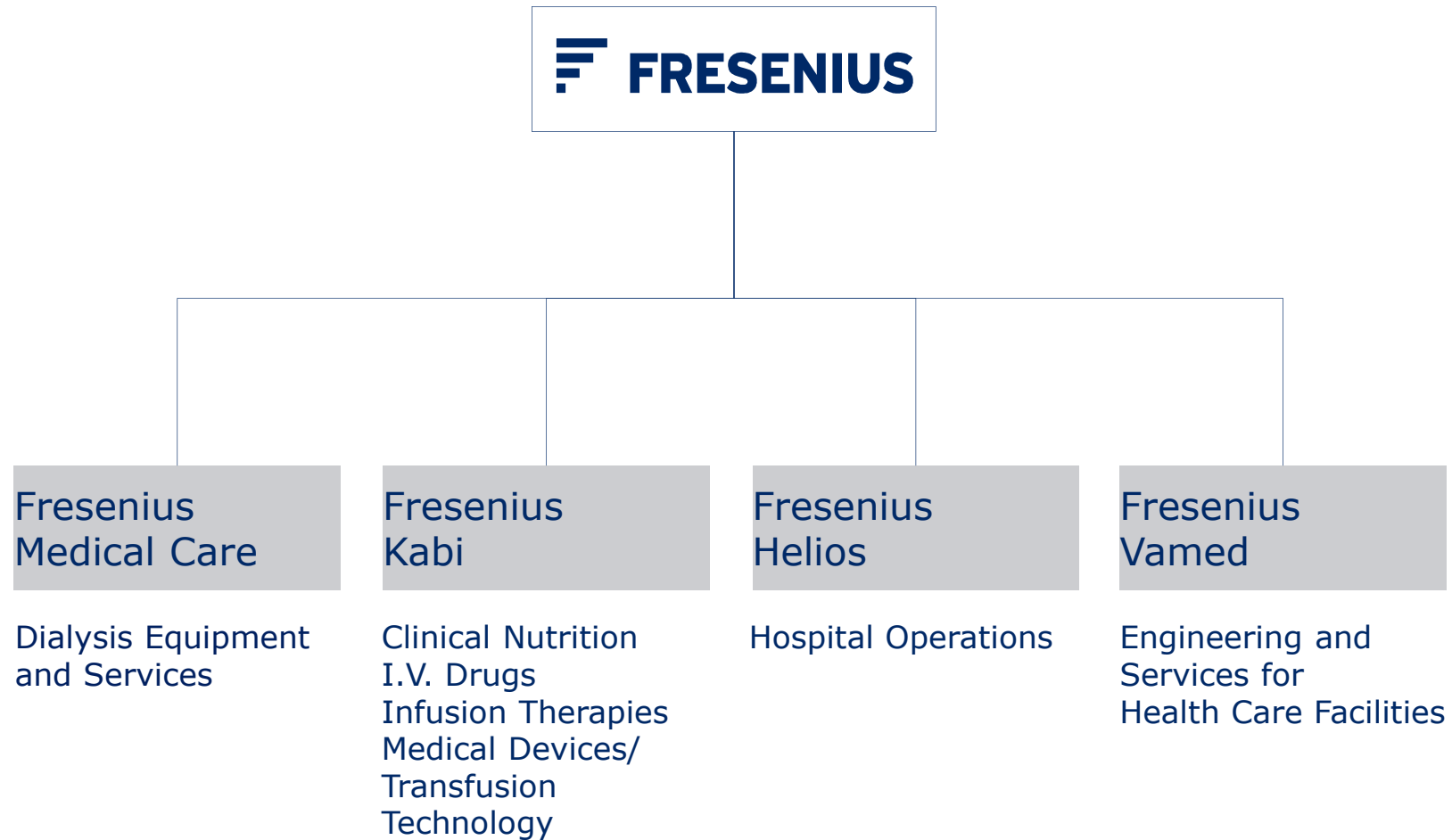## at Fresenius Kabi
plant Cavezzo - Italy

JMP Discovery Summit 2015,
Brussels, 25 March 2015
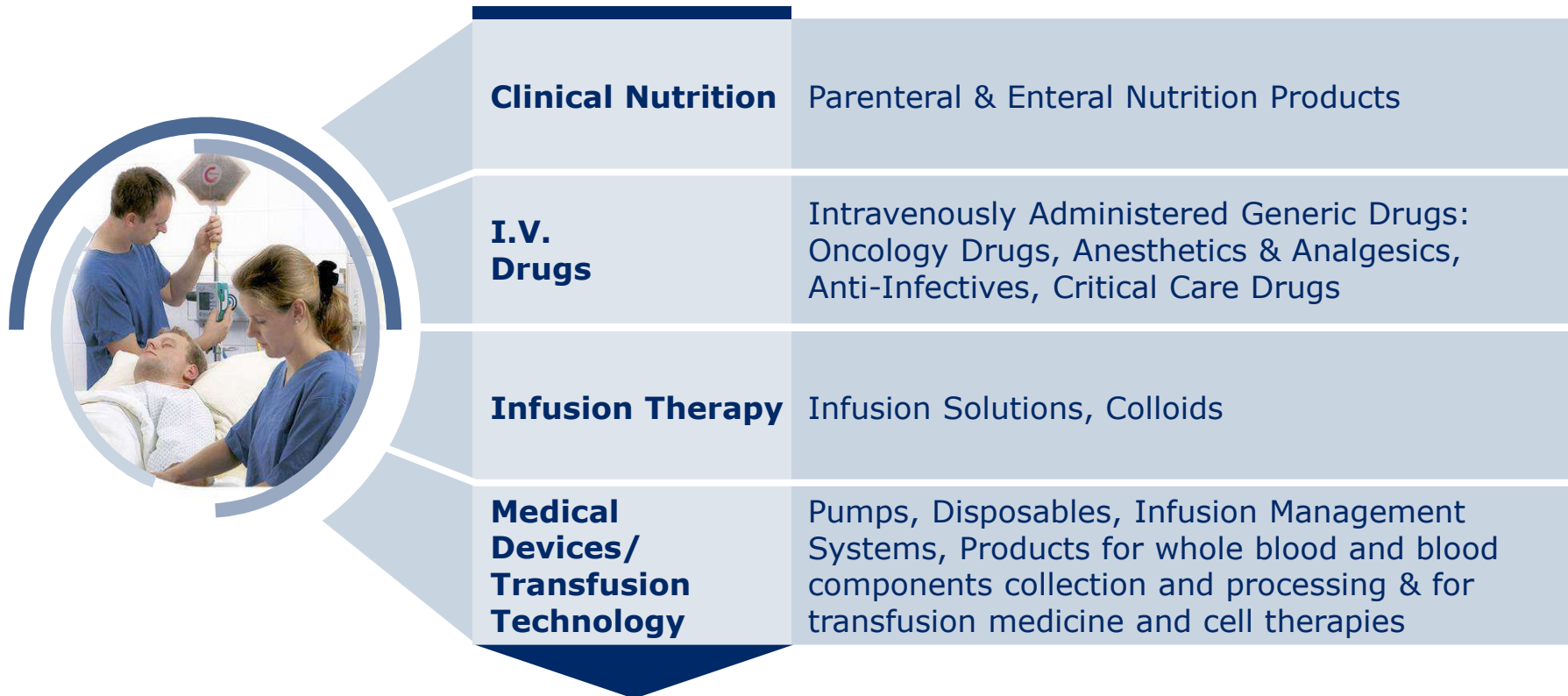
The Fresenius Group

FRESENIUS

Fresenius Medical Care	Fresenius Kabi	Fresenius Helios	Fresenius Vamed
Dialysis Equipment and Services	Clinical Nutrition I.V. Drugs Infusion Therapies Medical Devices/ Transfusion Technology	Hospital Operations	Engineering and Services for Health Care Facilities

The Business
Pharmaceuticals and Medical Devices

Clinical Nutrition	Parenteral & Enteral Nutrition Products
I.V. Drugs	Intravenously Administered Generic Drugs: Oncology Drugs, Anesthetics & Analgesics, Anti-Infectives, Critical Care Drugs
Infusion Therapy	Infusion Solutions, Colloids
Medical Devices/ Transfusion Technology	Pumps, Disposables, Infusion Management Systems, Products for whole blood and blood components collection and processing & for transfusion medicine and cell therapies

High quality and affordable products for the therapy and care of critically and chronically ill patients in hospital and outpatient care

About the Project

Project Objective:
Create an online process supervisor of a new, automated manufacturing line

Project timeframe: 6 weeks

Toolbox:
- SQL data server, JMP11
- 2-day scripting course
- 2-day project workshop

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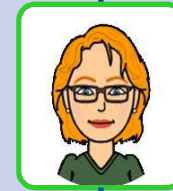
About the Authors

JMP trainer, Scripting Expert

STATCON

S. Hoffmeister

OPEX team, SQL data feed Project Manager
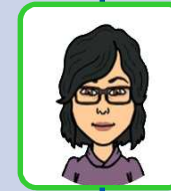
FRESENIUS KABI caring for life

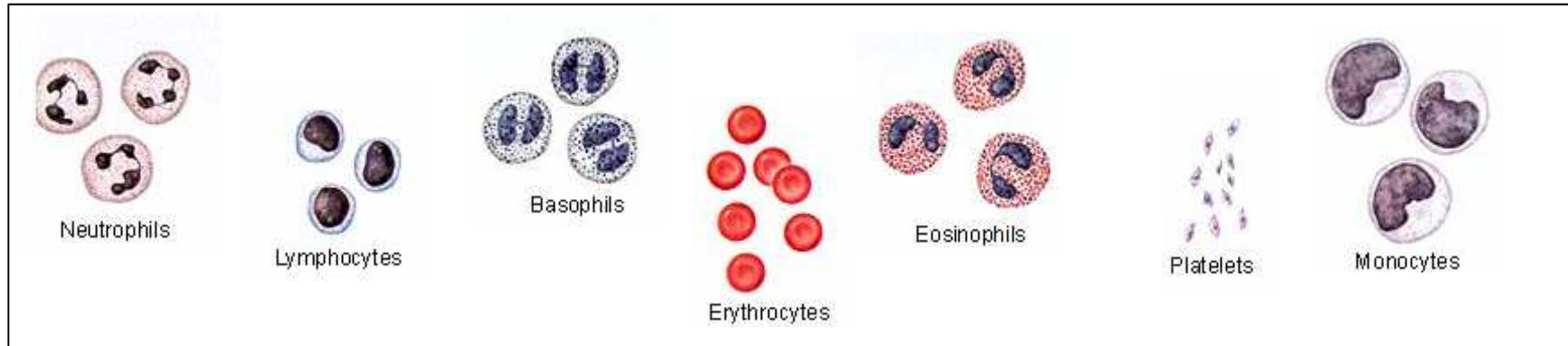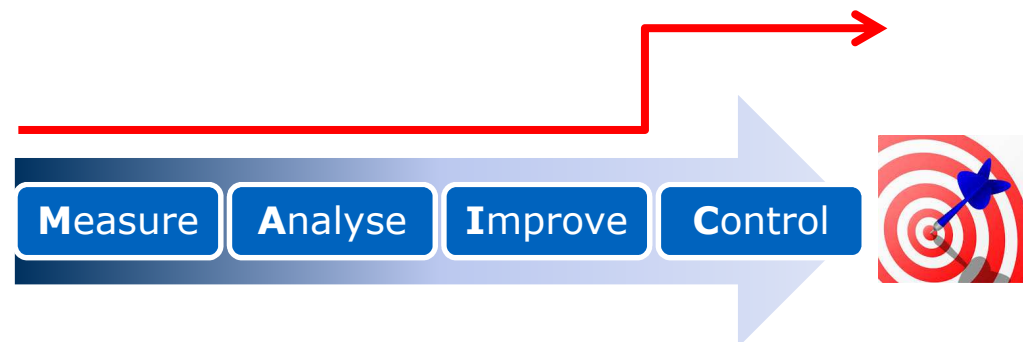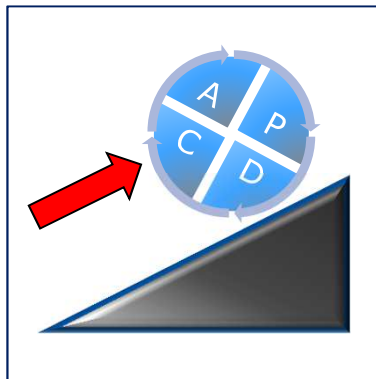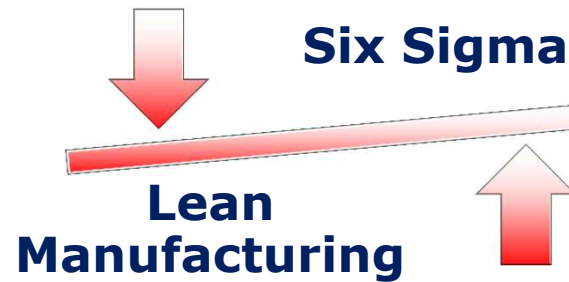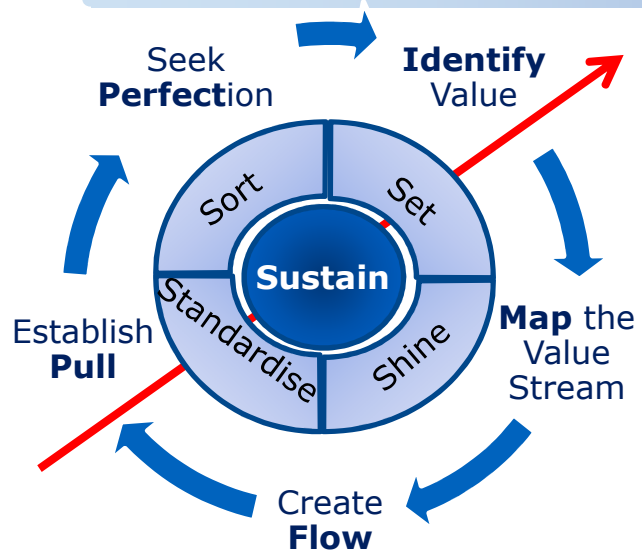| A. Girotti IT Manager | L. Zambianchi Six Sigma Black Belt | S. Bergonzini Sr. Process Validation Specialist | E. Caiazzo Process Validation Specialist | L. Ferraresi Process Eng. Filter Assembling |

Agenda

- Introduction & scope

- Foreword

- Process Map

- Project Work Breakdown Structure

- Structure of the JSL interface and «How To»

- Demo

- Conclusion

Leukodepletion

Lean (&) Six Sigma

Seek **Perfect**ion

Identify Value

Sort

Set

Sustain

Standardise

Shine

Establish **Pull**

Create **Flow**

Map the Value Stream

Six Sigma

Lean Manufacturing

A
P
C
D

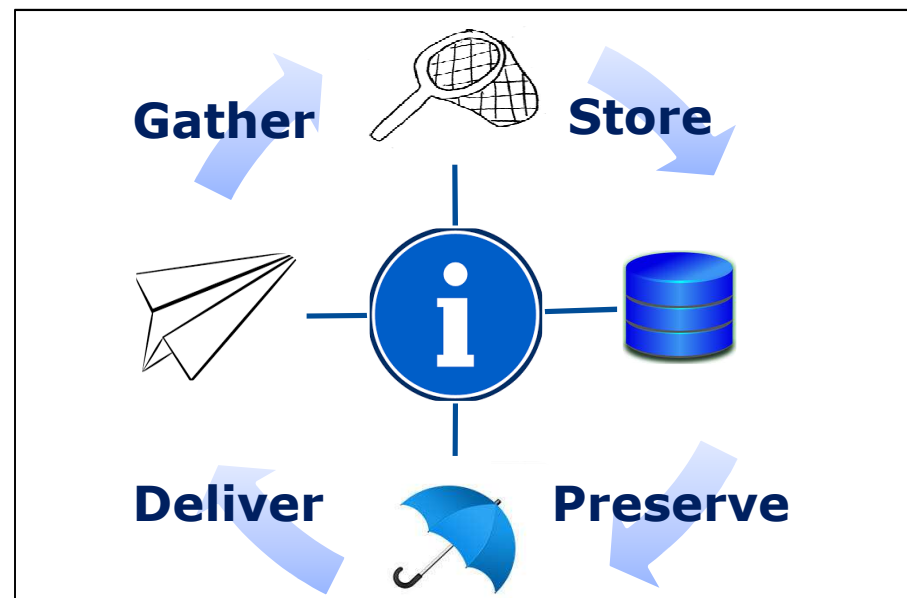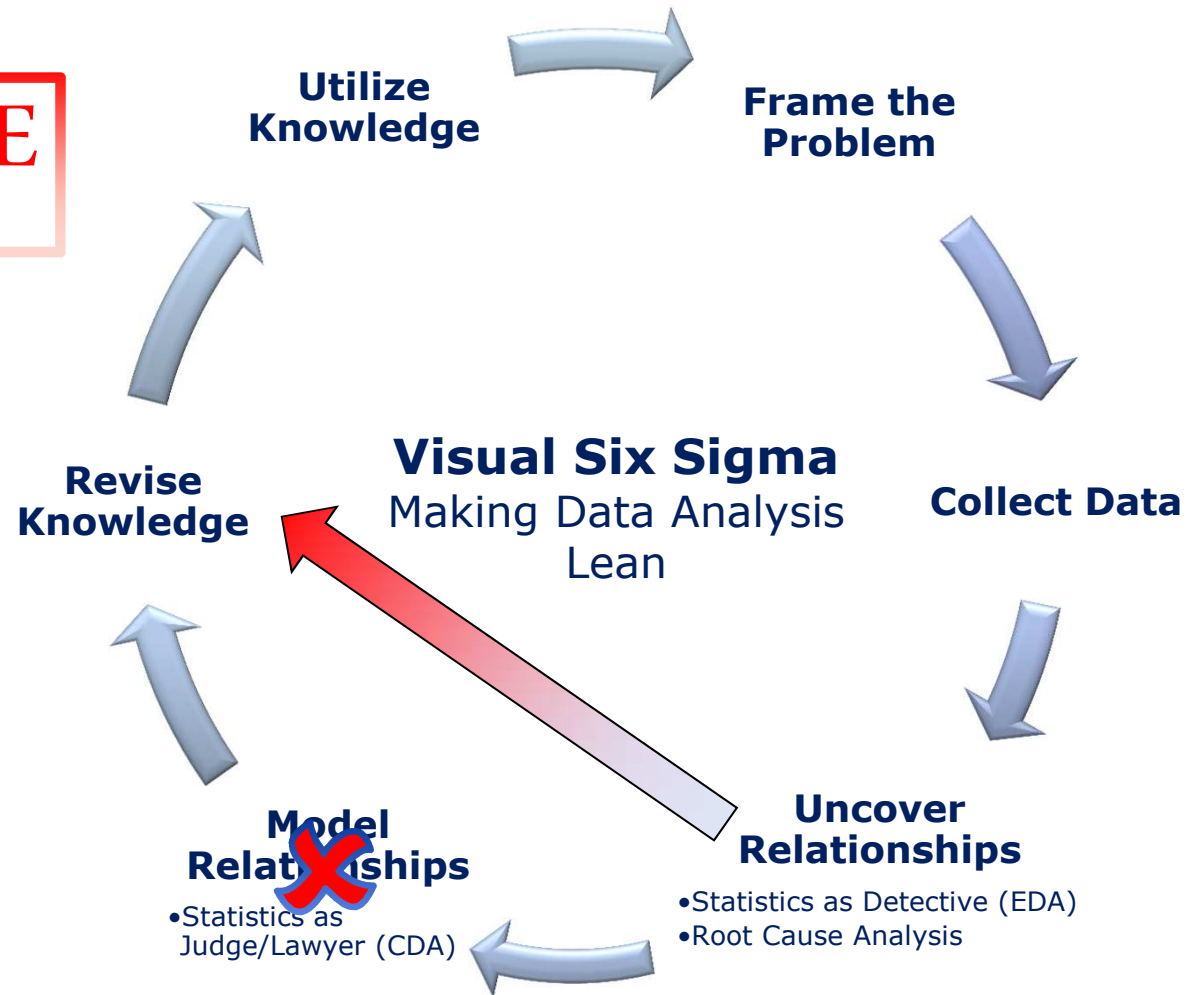| **M**easure | **A**nalyse | **I**mprove | **C**ontrol |

Information management

**In any process,
the flow of information is
a process itself.**

Information Management

Design for Visual Six Sigma - DFVSS

JUST IN TIME

Utilize Knowledge

Frame the Problem

Visual Six Sigma
Making Data Analysis Lean

Collect Data

Revise Knowledge

Model Relationships
•Statistics as Judge/Lawyer (CDA)

Uncover Relationships
•Statistics as Detective (EDA)
•Root Cause Analysis

The Project (s)

QC
online

QC
offline

Process
Parameters

Materials
&
Defectives

JSL
Backbone

Expert
Knowledge

Welding
Equipment
SQL DBs

Single Piece
Traceability

JSL Training

June 2014

April 2014

Process Map*
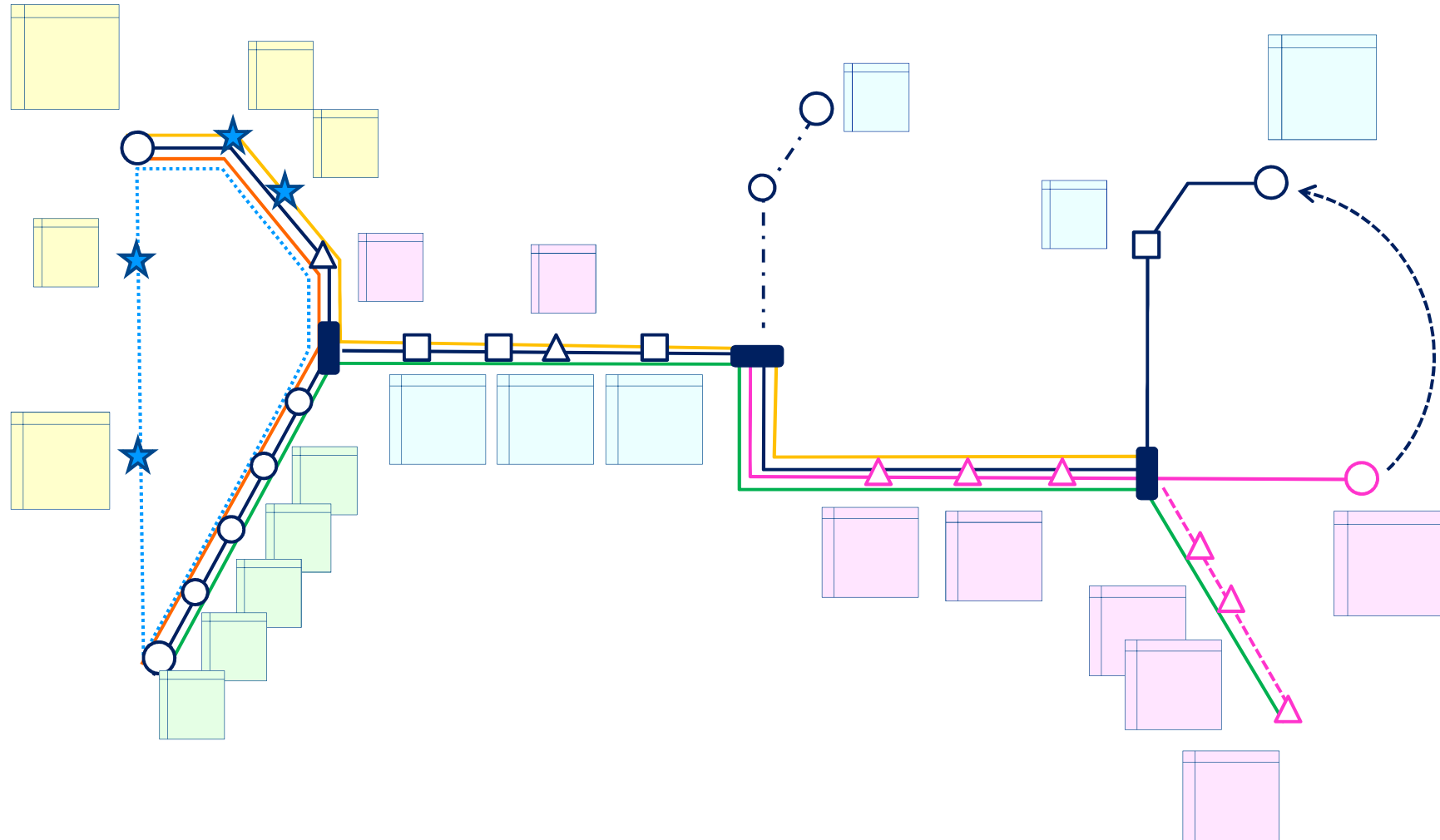
*schematic drawing not reflecting the real process

Work Breakdown Structure (WBS)

Batch/Item Traceability

Productivity & Defectives

Process Parameters
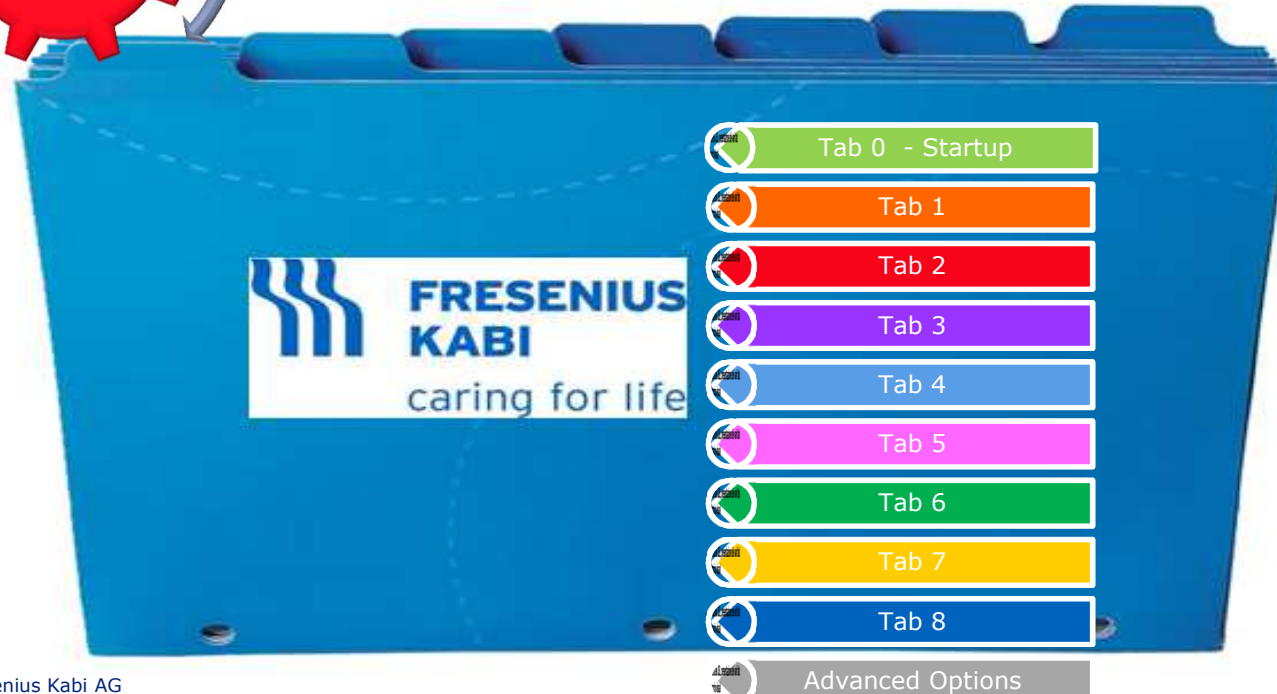
Material Consumption

Offline Quality Controls

Online Quality Controls
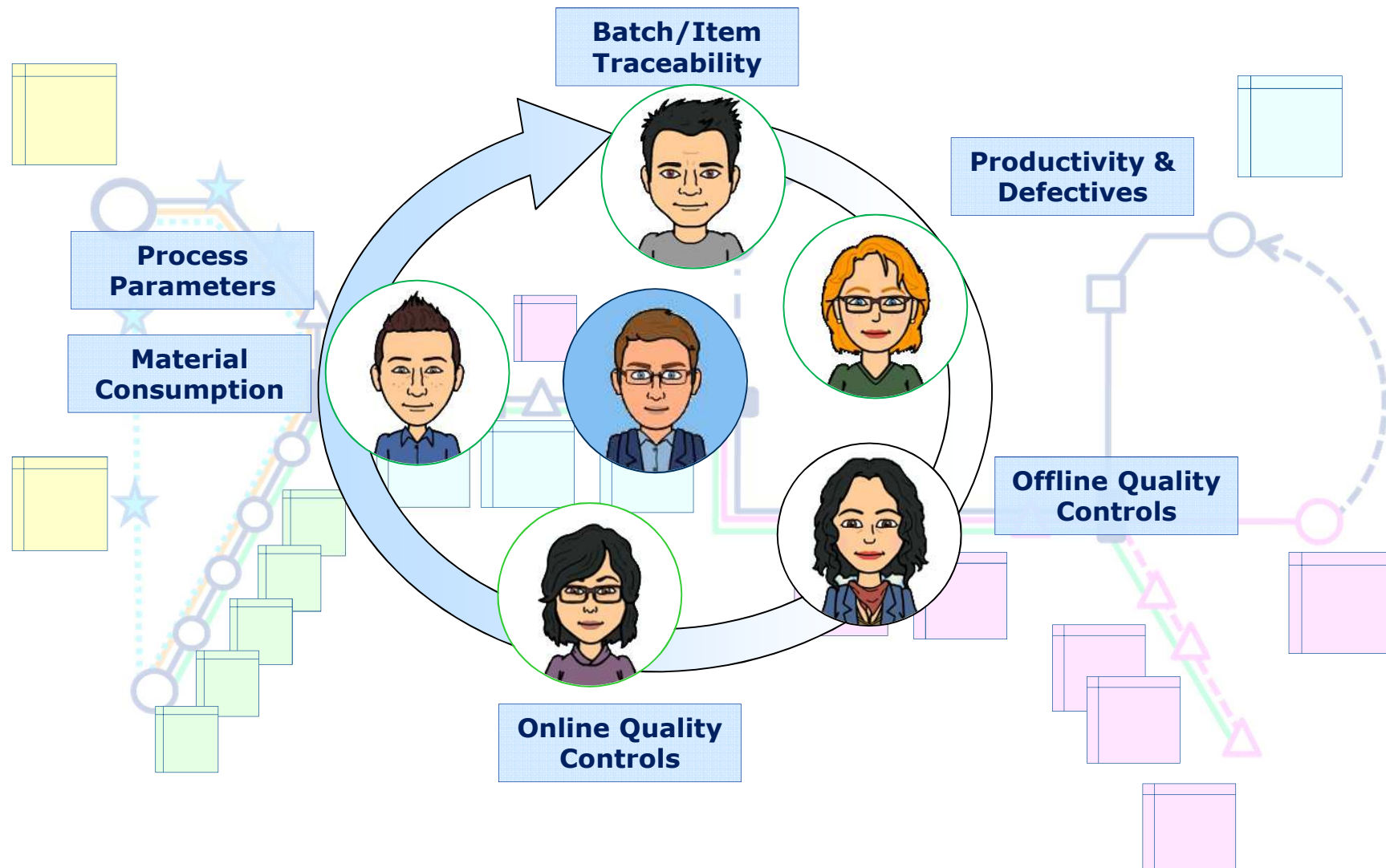
Structure of the JSL
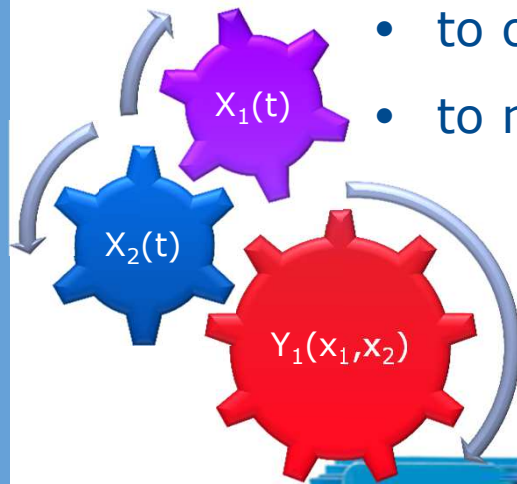
- to organize Functions and Parameters profiles ➡ **JSL**
- to manage X's and Y's information ➡ **USERS**

$X_1(t)$

$X_2(t)$

$Y_1(x_1, x_2)$

TAB BOX

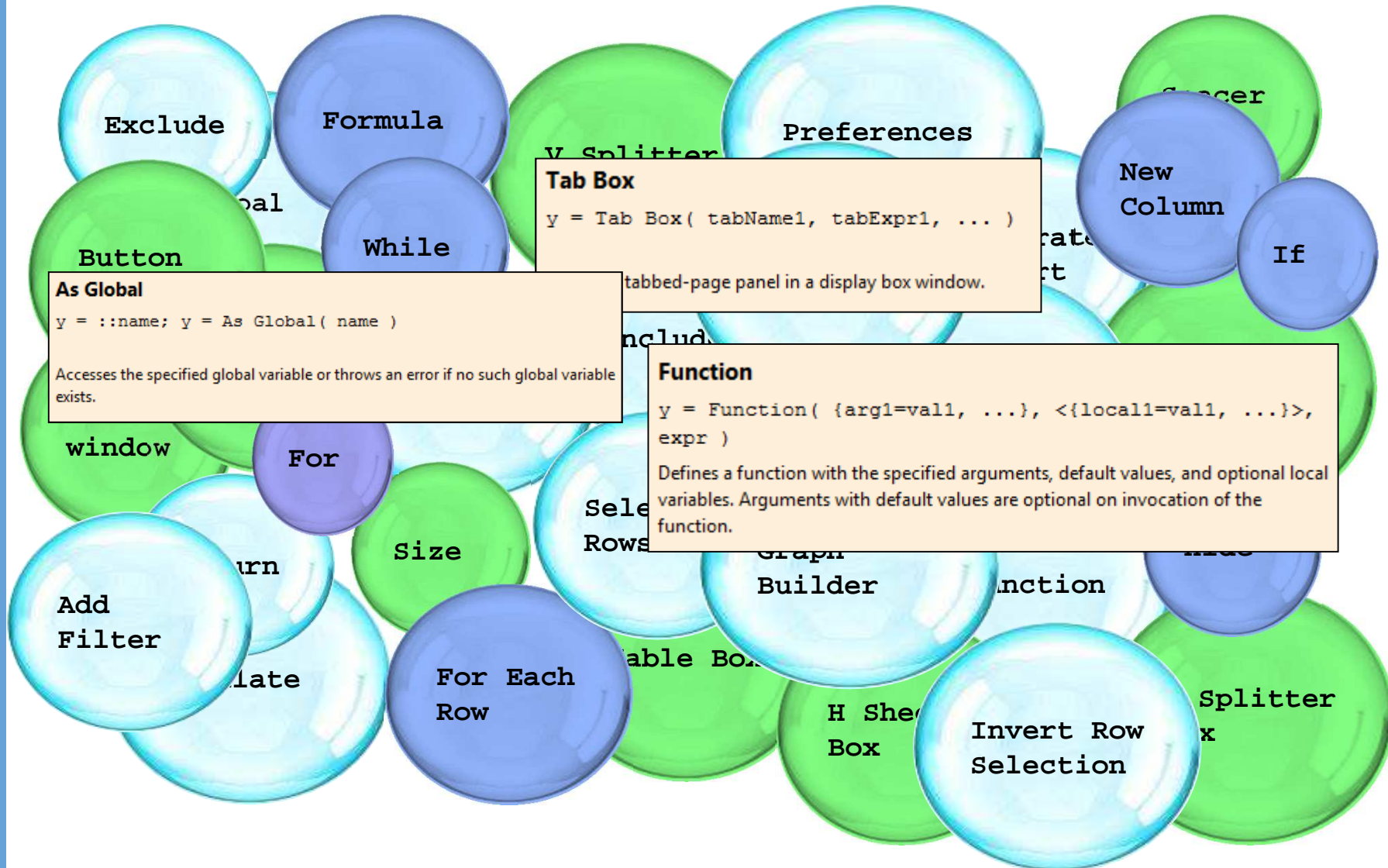| Tab |
|-----|
| Tab 0 - Startup |
| Tab 1 |
| Tab 2 |
| Tab 3 |
| Tab 4 |
| Tab 5 |
| Tab 6 |
| Tab 7 |
| Tab 8 |
| Advanced Options |

Disclaimer

For confidentiality reasons, the demo that follows has been modified from the original version of the JSL script in these points:
- The database is static and local
- Graphs and tables are without labels
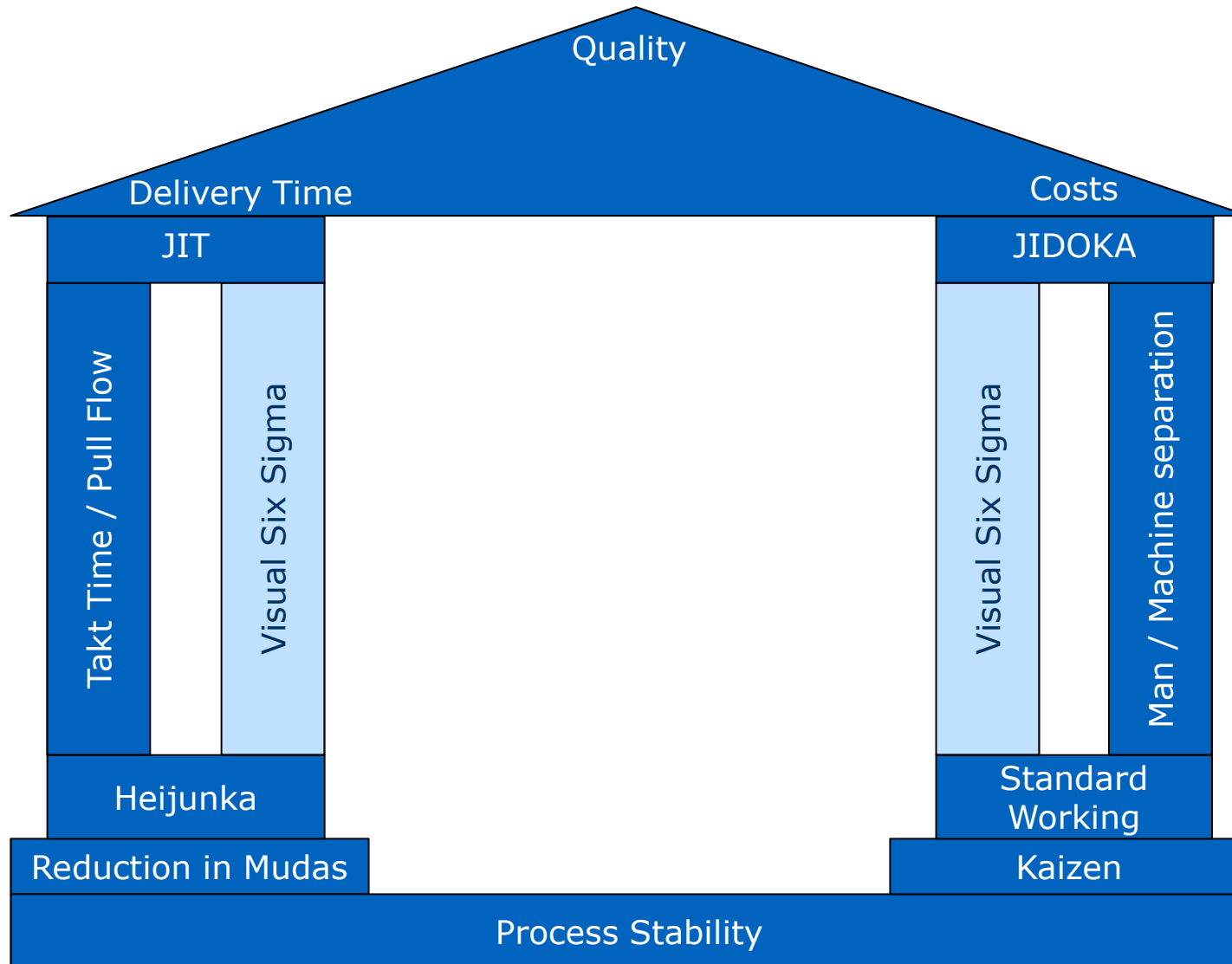- Some figures have been modified from the original

JMP Application

JSL functions and commands

Exclude

Formula

Preferences

V Splitter

Tab Box

y = Tab Box(tabName1, tabExpr1, ...)

New Column

Button

While

tabbed-page panel in a display box window.

If

As Global

y = ::name; y = As Global(name)

Accesses the specified global variable or throws an error if no such global variable exists.

Include

Function

y = Function({arg1=val1, ...}, <{local1=val1, ...}>, expr)

Defines a function with the specified arguments, default values, and optional local variables. Arguments with default values are optional on invocation of the function.

window

For

Size

Sele Rows

Graph Builder

nction

Add Filter

For Each Row

H She Box

Invert Row Selection

Splitter

able Bo

Our Vision

Conclusions

Everything should be made as simple as possible, but no simpler.

A. Einstein

Excellence is never an accident. It is always the result of high intention, sincere effort, and intelligent execution; it represents the wise choice of many alternatives - choice, not chance, determines your destiny.

Aristotele

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