Blending Lean and New Automation Solutions in Cytology to Improve Quality, Cut TAT, and Reduce Cost

Lab Quality Confab

October 2014

BD

WHO ?

THE LEAN ENTERPRISE ACADEMY

LEAN Certified

2008

BD

BD MPD Program™

Measure, Predict, Deliver

European LEAN Specialist

since 2013

SIEMENS

Workflow Consulting

2004 -2013

CYMRU

6σ

Six Sigma Black Belt

2009- 2010

BD Totalys™ System

MOTOROLA

NOKIA

orange™

BD

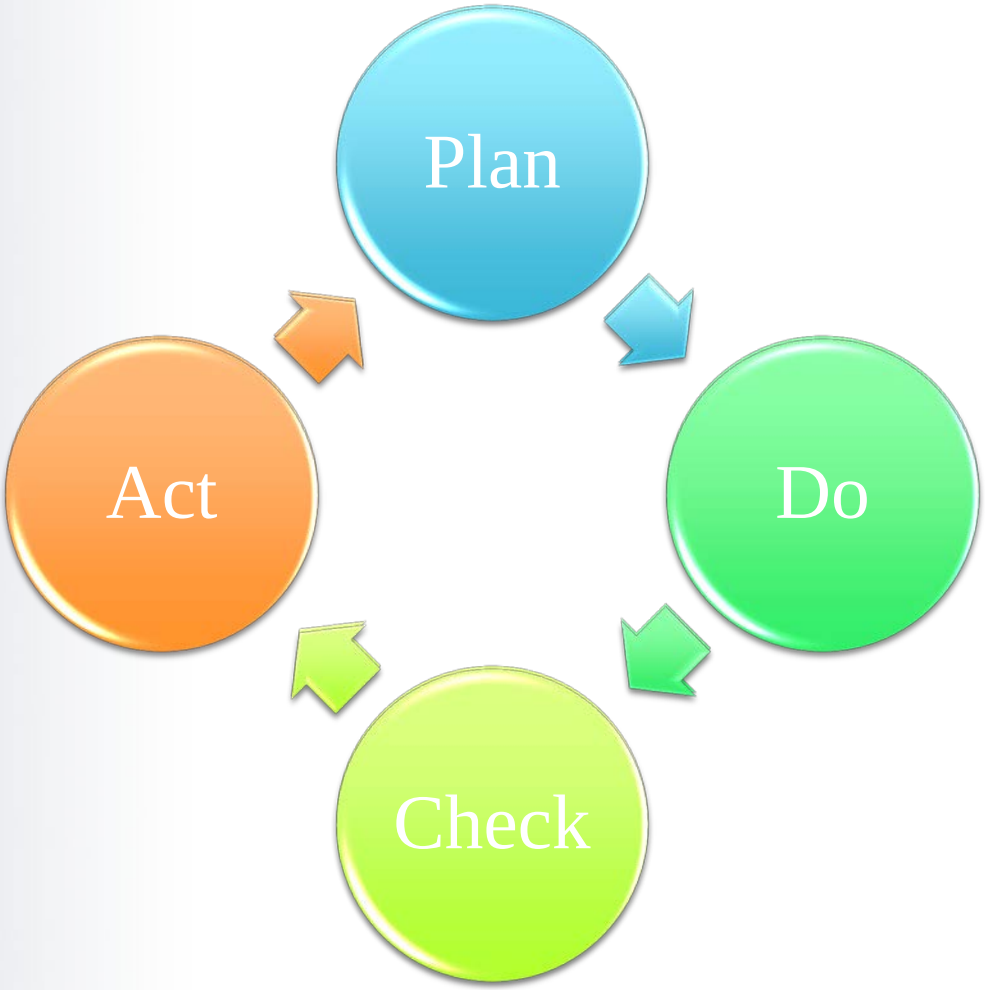
Objectives

- Current trends in Cytology
- Solutions: MPD Approach & innovative Technology
- The method, tools and why
- Real life examples, data & outcomes

Current Trends in Cytology

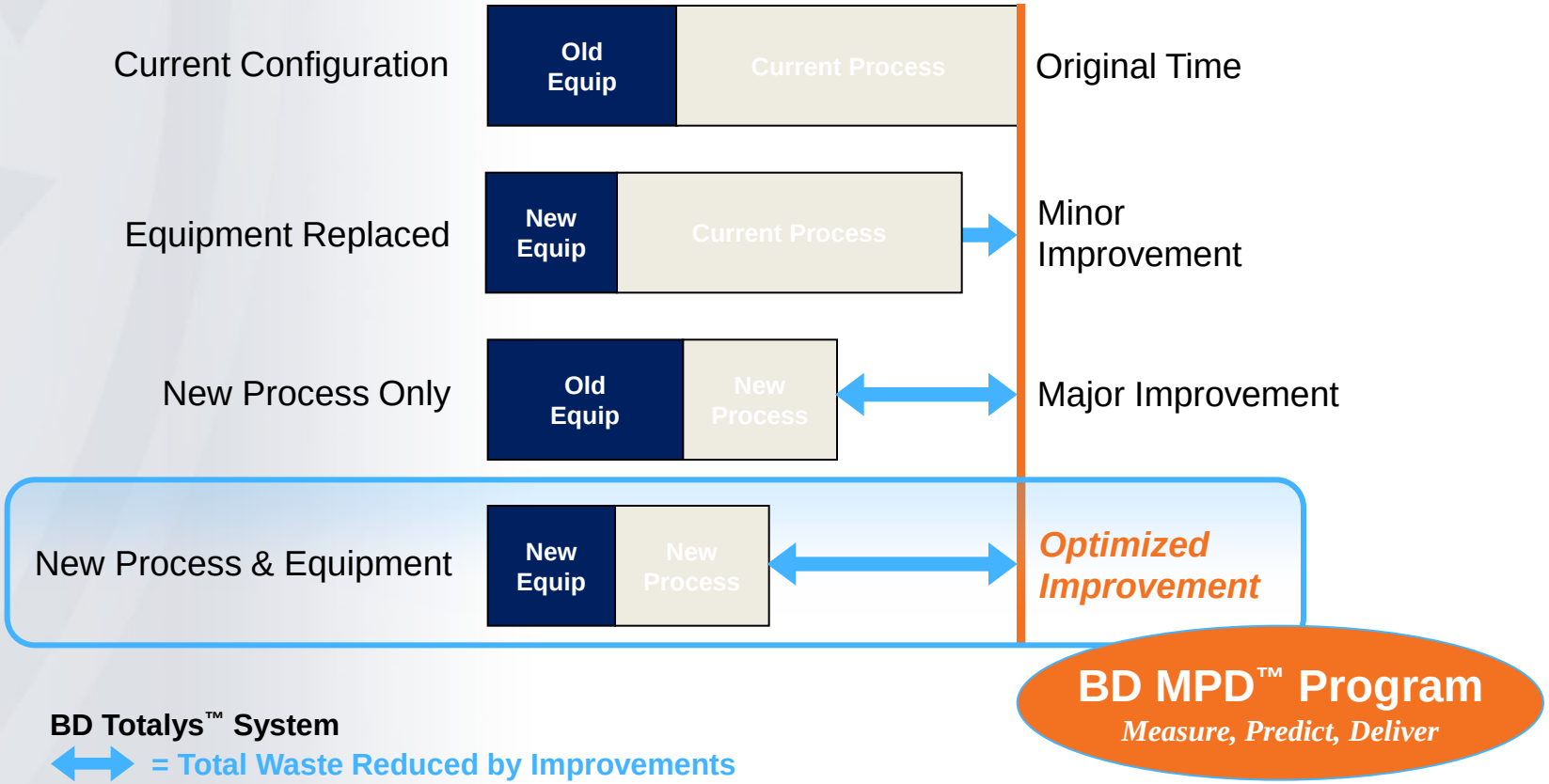
- Centralization of Cervical Cancer screening
  - Regional models
  - Private / Public collaboration's
  - Development of national screening programs
- Testing paradigm change
  - Moving towards HPV primary screening
- Focus on Quality
  - ISO accreditation
- Shrinking Budgets
  - Need to do more with less

Approach – MPD



MPD Approach - Objectives

Achieving Optimal Goals



BD Totalys™ System

= Total Waste Reduced by Improvements

Lean says “New equipment and products need new processes”

BD Totalys™ System
Product Overview

Front End automation in Cytology

Empowering Laboratories to Deliver Actionable Results to Clinicians Today and in the Future

Continuous Improvement Program

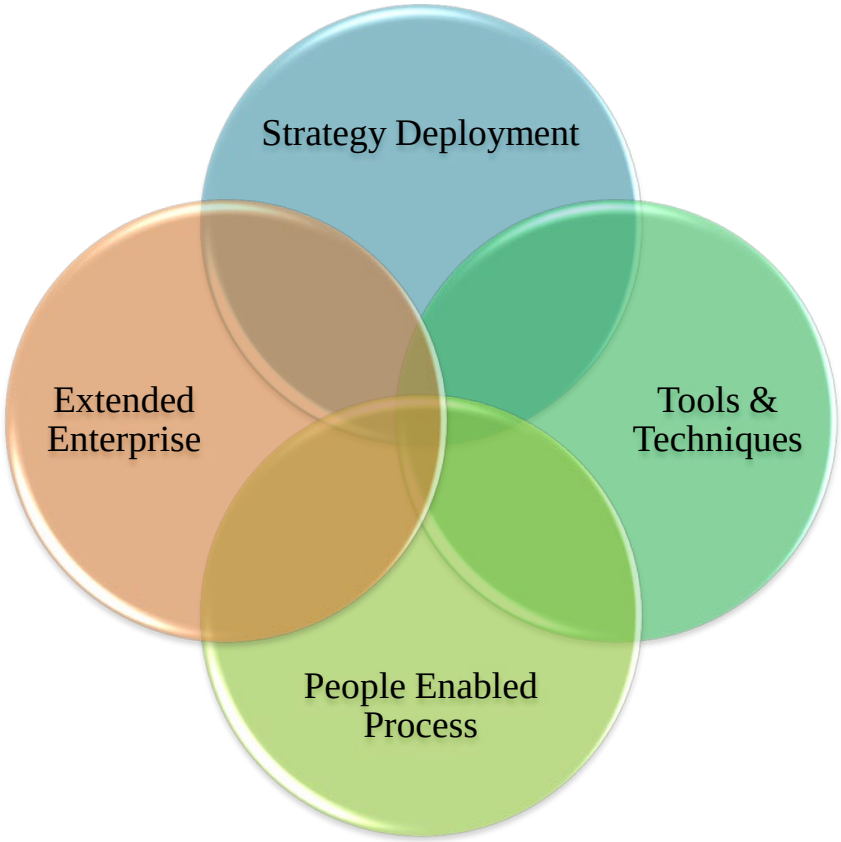
BD

Walk Away Solutions in Molecular

Empowering Laboratories to Deliver Actionable Results to Clinicians Today and in the Future

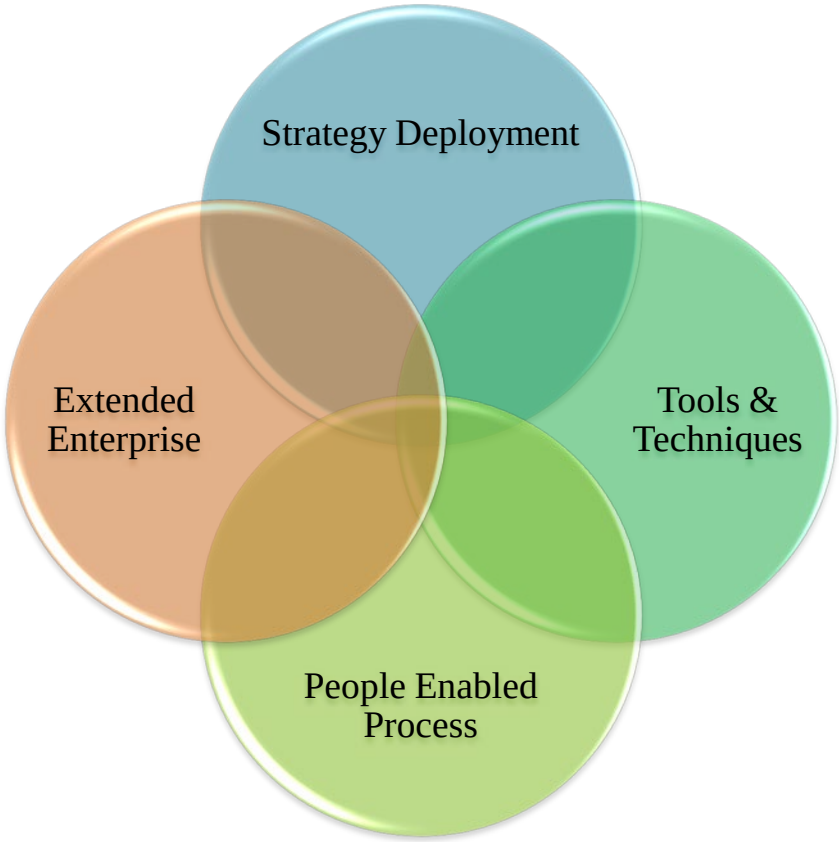
Vision – Reasons for change

- Strategy
  - Why – drivers for change
  - Where – what's the Vision
  - Goals – Critical success Factors
- External influences
  - National targets
  - Testing paradigms
- Internal influences
  - Financial
  - Resources



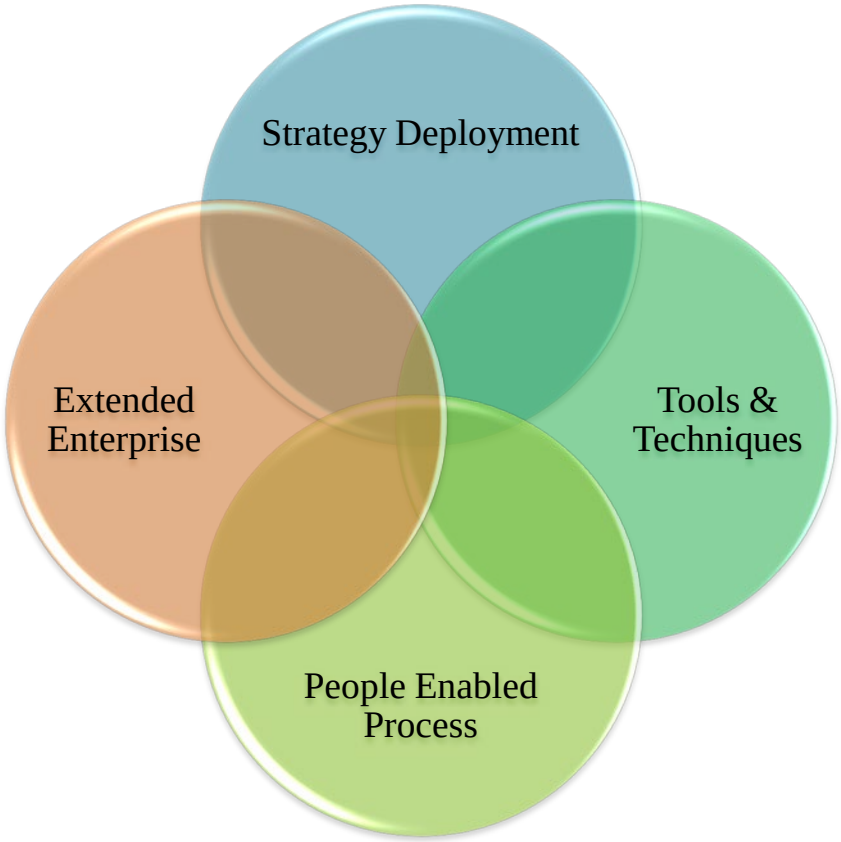
Go to the Gemba

- Walk the pathway
  - Flow, Waste & Over Burden
  - Establish areas of opportunity
  - Identify best practice
- Map the process
  - Hands on Time (HOT)
  - Walk Away Time (WAT)
  - Wait time
- Resource information



People - engagement

- Education and alignment workshops
  - Expectation management
  - Project planning
  - System and Methodology
  - Lean Thinking and Tools
- Site preparation
  - Lab Layout
  - IT infrastructure changes
- Extended Value Stream
  - clinician outreach
  - Sample taker training



Current and Future – Shared understanding

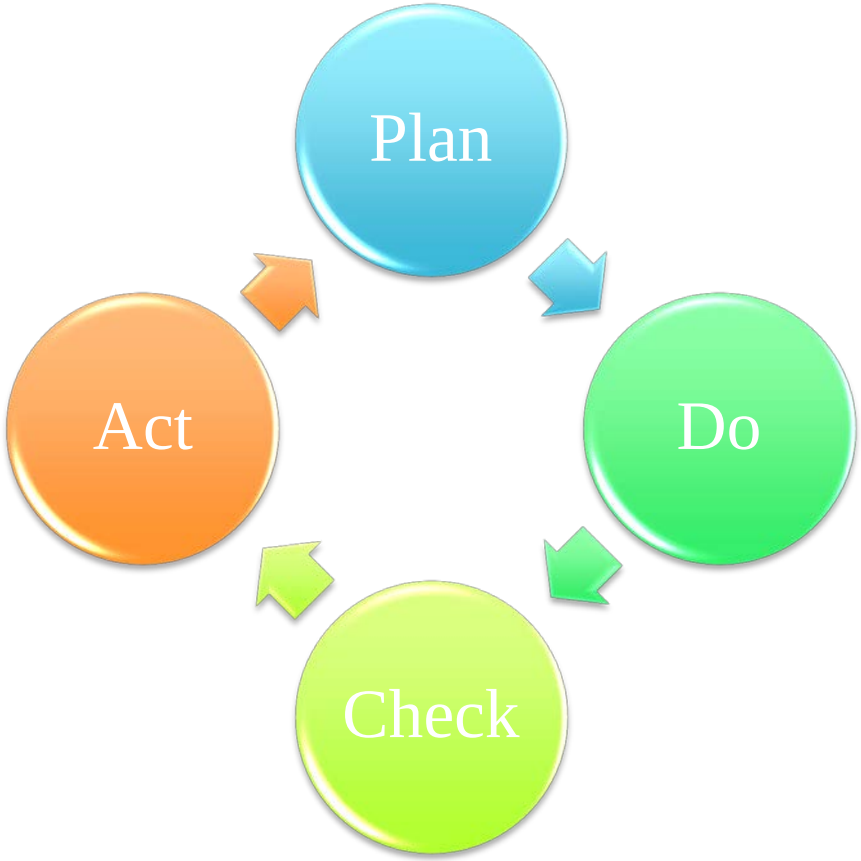
- Current state
  - Flow, Waste , Burden
  - Best Practice
  - Opportunities
  - Resource utilization
- Future state
  - Ideal process
  - Gap analysis
    - Process
    - IT
  - Work Flow / Process Simulation
  - Lab Layout
  - ROI and Resource utilization

A base line for CI

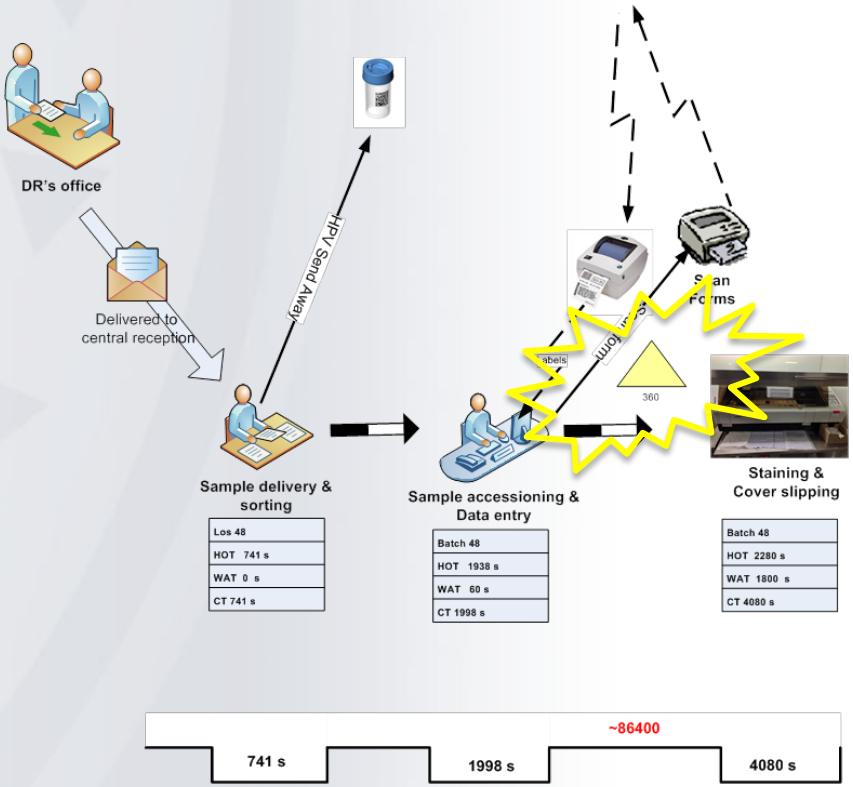
BD

Current and Future – Management & monitor

- Key Performance indicators.
  - Customer focused
  - Real time
  - Simple and relevant
- Visible.
  - Process cockpits
  - Focus of daily huddle
  - Drives engagement

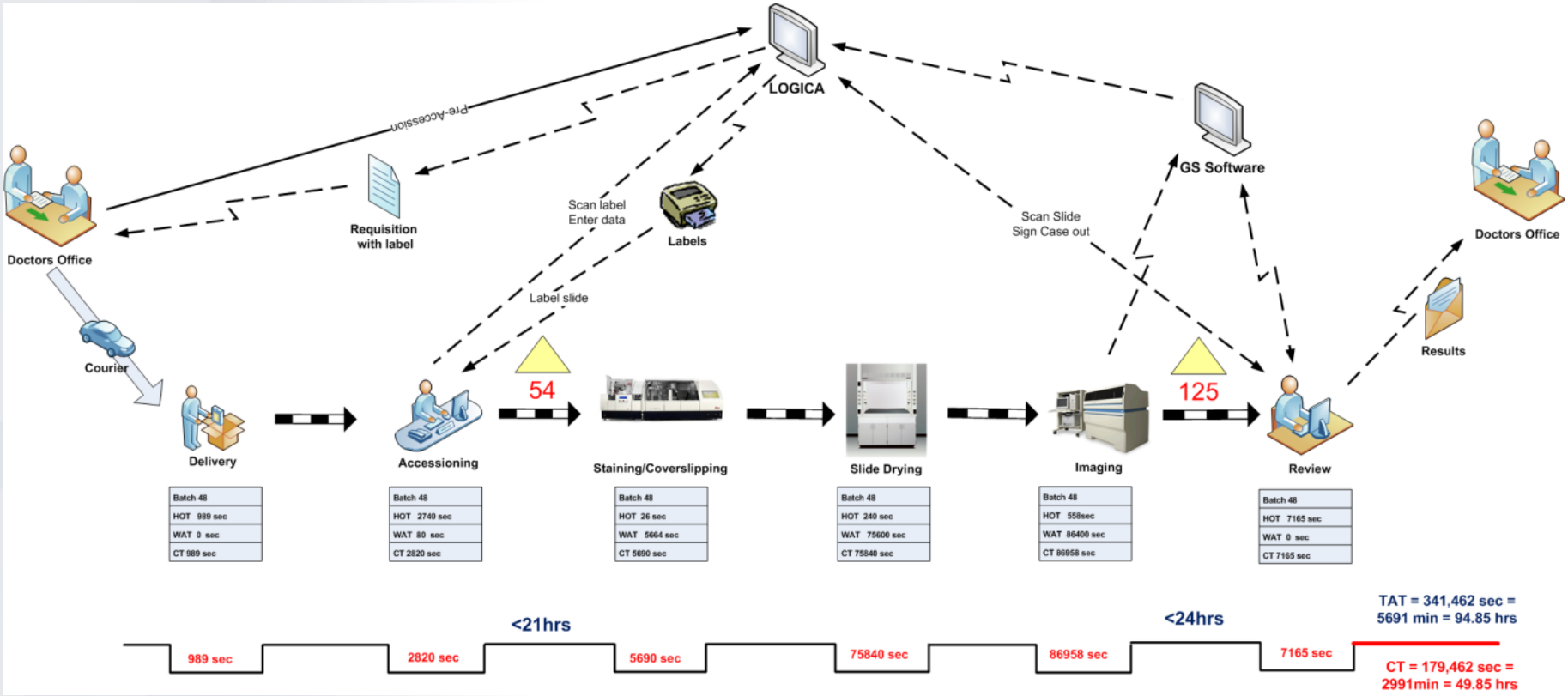


Common opportunities



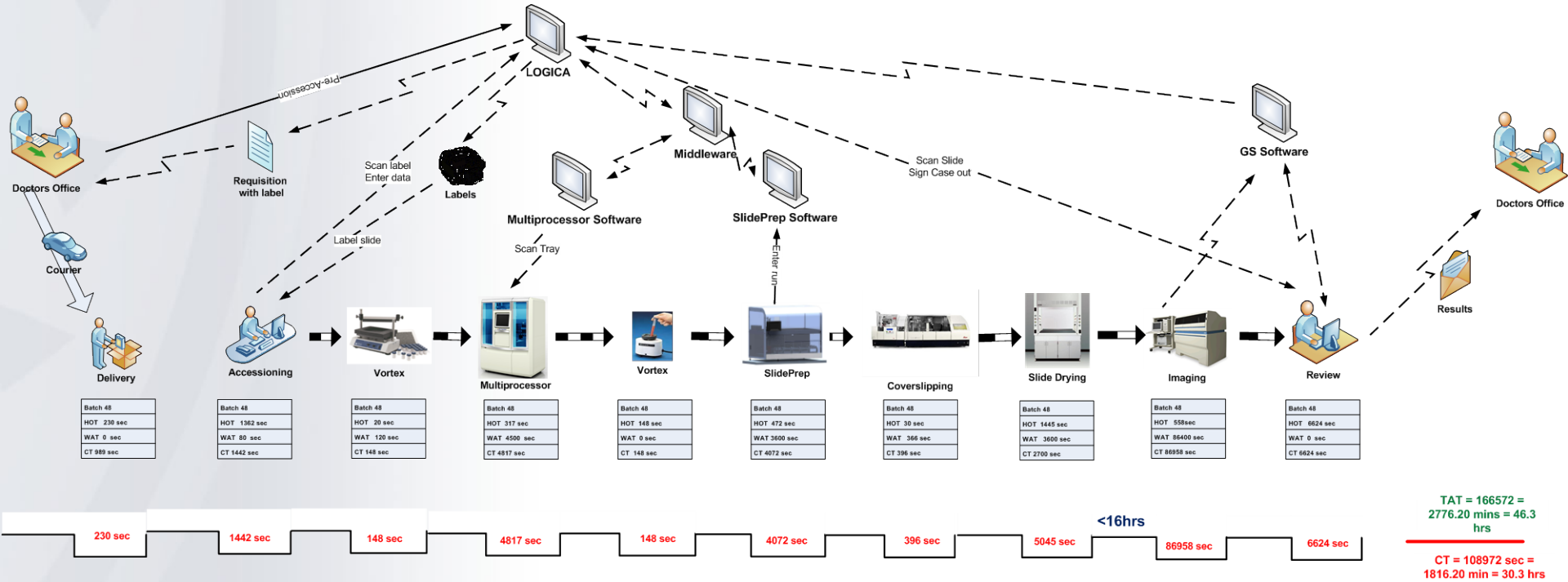
- Poor Flow
- Rework
- No Standard work – outdated policies
- Manual Tracking / Chain of Custody
- Low productivity
- Poor use of resources

Example VSM – pre implementation Conventional Cytology



HOT : Hands-On Time
WAT : Walk-Away Time
WT : Wait Time = Time where samples wait for a process step to be performed
CT: Cycle Time = HOT + WAT
TAT: Turn Around Time = CT + WT

Example VSM – post implementation LBC Cytology

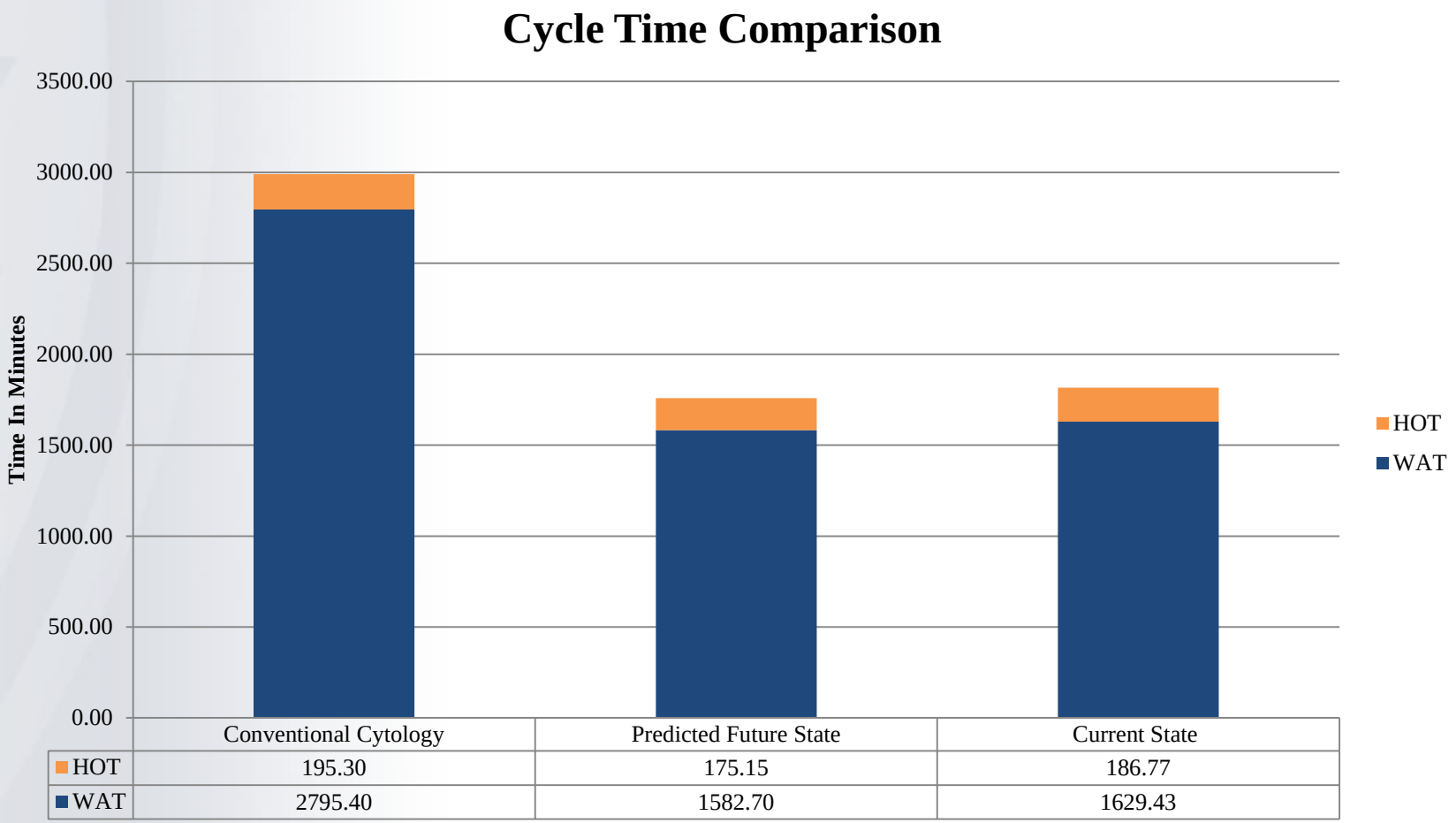


HOT : Hands-On Time
WAT : Walk-Away Time
WT : Wait Time = Time where samples wait for a process step to be performed
CT: Cycle Time = HOT + WAT
TAT: Turn Around Time = CT + WT

BD

Current State April 2014

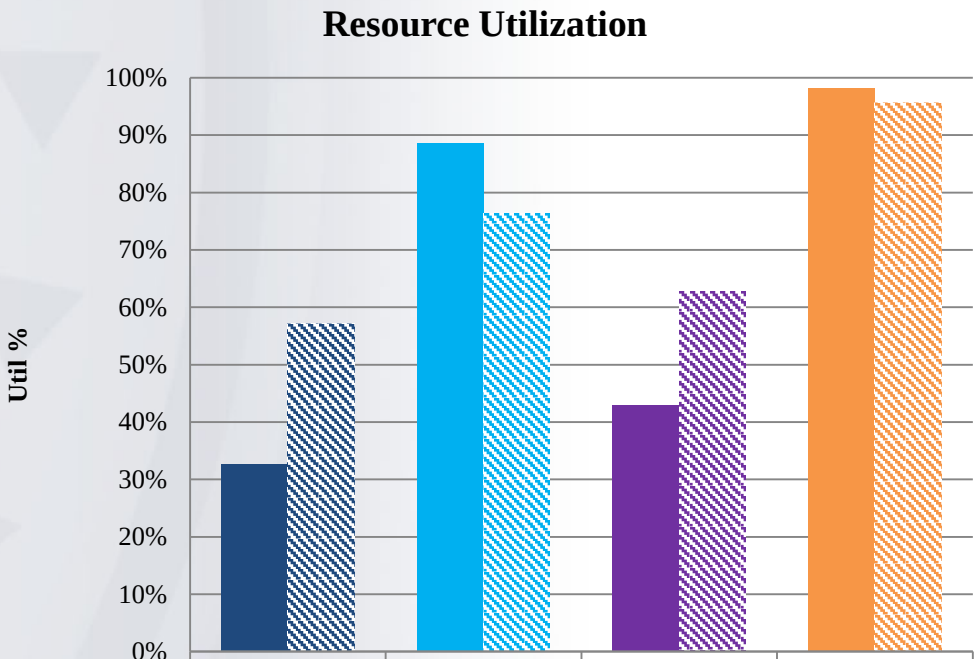
Analysis



	Conventional Cytology	Predicted Future State	Current State
HOT	195.30	175.15	186.77
WAT	2795.40	1582.70	1629.43

CT for a batch of 48

Resource Utilization comparison SurePath / Totalys process – Process Simulation



	Admin	Lab	Sample Delivery	Screening
Utilization	33%	89%	43%	98%
Utilization 2	57%	76%	63%	96%

Simulation assumes ideal future state processes, use of No Further Review and current % of resource availability

BD SurePath 84,000 LBC samples per annum
Resource FTE / WTE – Cytology

Admin	**6**
Lab	**2**
Sample Delivery	**2**
Screening	**11**

BD Totalys 140,000 LBC samples per annum
FTE / WTE - Cytology

Admin	**6**
Lab	**2**
Sample Delivery	**2**
Screening	**11**

Cost Per Test Calculation

	Lab 1	Lab 2	Lab 3	Totals
Current	26000	26000	15000	
FTES	€ 97,230.00	€ 78,758.00	€ 37,376.00	€ 213,364.00
Consumables	€ 38,667.00	€ 39,749.00	€ 48,360.00	€ 126,776.00
transport	€ 24,700.00	€ 24,700.00	€ 19,500.00	€ 68,900.00
Totals	€ 160,597.00	€ 143,207.00	€ 105,236.00	€ 409,040.00
	€ 6.18	€ 5.51	€ 7.02	
Future				
FTES	€ 25,336.00	€ 31,824.00	€ 16,628.00	€ 73,788.00
Consumables	€ 96,302.00	€ 96,302.00	€ 55,559.00	€ 248,163.00
transport	€ 24,700.00	€ 24,700.00	€ 19,500.00	€ 68,900.00
Totals	€ 146,338.00	€ 152,826.00	€ 91,687.00	€ 390,851.00
	€ 5.63	€ 5.88	€ 6.11	

Indicative Cost Per Test

Current € 6.11

Future € 5.83

Cost per test across the network

EXAMPLE

3 laboratories centralizing Cytology sample preparation and slide production on to one site

BD

Standard Batch Size implemented

Standard Batch Size of 48 implemented throughout entire process.

The whole process is managed by 2 people. One of them is a Cyto screener and has enough walk away time to screen slides in the afternoons

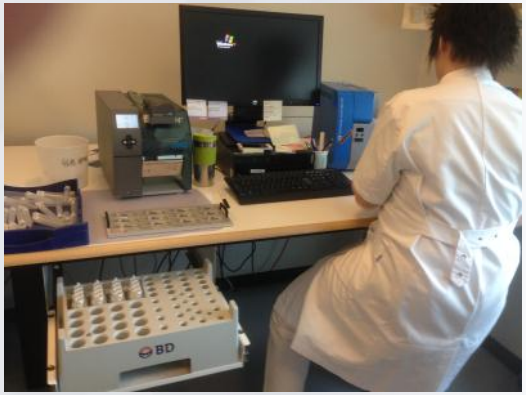
These work together receiving, accessioning and data entry a single batch to insure that there is a batch available for processing when the previous batch is completed.

Visual management implemented

MultiProcessor and SlidePrep trays identified with a coloured dot to enable easy management of vials and slides throughout the process.

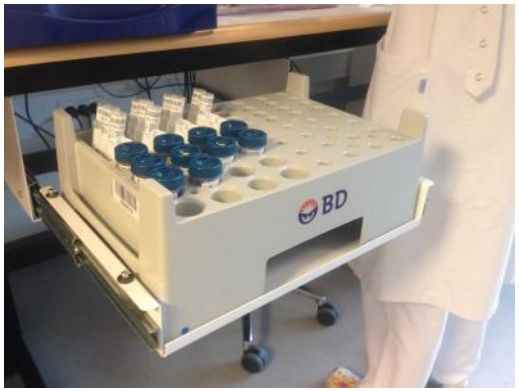
HPV samples identified with a yellow spot on lid. Easy to identify and pull out after processing

Single piece flow in data accessioning



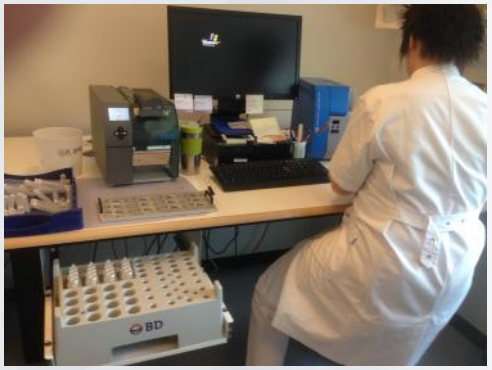
Accessions the sample, completes data entry, labels the vial and C-Tube, and print the slide for each request.

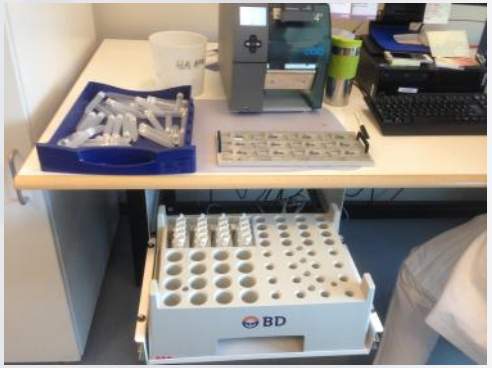
places the vial, C-Tube and slide in the appropriate tray before moving on to the next request



BD

Ergonomic Workstation layout





The workstation has been designed so that the whole task can be done easily with everything required to complete the activity easily accessible

The MutiProcesser tray holder places the tray at the ideal height to place vial and C-tube in the tray with out reaching or bending over.

Outcomes

Improvement examples

- Cytology process moved to one site reducing process complexity and the need to transport slides through the network
  - Tripling annual sample volume from 20,000 to 60,000 samples a year
- Additional volume process with no increase in resources – 1.5 FTE/WTE
- Reduction
- Reducing the time to result to comply with national guidelines
  - Improved time to result. Cytology turn around times (TAT) – 51.19% reduction in TAT 94.85hrs to 46.3hrs
  - Reduction in process cycle times by 39.22% - 49.85hrs to 30.3hrs
  - Meeting national turn around guidelines of 10 days from receipt – Current TAT <=7 days.
- 72% reduction of unsatisfactory results That meant going from an unsatisfactory rate of 4.4% with conventional pap smears to less than 1.5% with SurePath Liquid Based Cytology.

Outcomes cont.

- A number of best practices have been implemented including
  - Visual management of the MultiProcessor and SlidePrep
  - Single piece flow in sample accessioning and data entry
  - Visual management of HPV samples for easy identification and further testing.
  - Ergonomic workstation layouts
- Key performance indicators posted in LEAN boards – display data as close to real time e.g. Daily / Weekly.
  - Encourage engagement in the process
  - Identify issues before they escalate