Considerations in Designing Custom Automation: Experiences with an "Open" Line

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Agenda
Considerations in Designing Custom Automation:

- History & Overview Kaiser Permanente NW Laboratory Automation
- 1995 Front End Open Automation - Design and Deployment
- 2002 Front End Open Automation with Instrumentation Integration
- 2012 Open Automation, Storage Integration & Optimization
- Capital Equipment Planning and Methodology & Vendor Changes

History & Overview Kaiser Permanente NW Laboratory
- Kaiser Permanente NW - Portland & SW Washington
- 480,000 members
- 2 Medical Centers, 22 Medical Offices
- Regional Reference Lab
1995 Front End Open Automation - Design and Deployment

- 1996 Laborix open system installation
- 20 ft Track, Uncapper, Recapper and 2 Specimen Sorter
- “High Volume Lab” Concept
- Hematology: XE2100 & SP100
- Chemistry: Roche
- Immunochemistry: Abbott AxSYM
- Coagulation: Dade
- Urinalysis: Boehringer Mannheim

2002 Front End Open Automation with Instrumentation Integration

- 2002 Laborix Leveraged Learnings
- Over 200 ft Track, System Redundancy, Uncapper, Recapper and Specimen Sorters
- “High Volume Lab” Concept
- Exploited with Full Instrument Integration
  - Bayer Centaur, Sysmex Autoline, Stago StaR
  - Roche & Urinalysis
  - Specimen Tracking & Remstar Storage
  - Dynamic Sequential Specimen Targeting – TSH Reflex Free T4

2012 Open Automation, Storage Integration & Optimization

- 2002 - 2012 Instrumentation vendors come and go but automation platform remains the same.
- Roche Chemistry replaced with Olympus with Robotic Interface
- Sysmex Hematology instruments and HST line with Robotic Interface
- Abbott AxSYM -> Bayer / Siemens Centaur -> Beckman DxC Direct Sample
- Urinalysis Boehringer Mannheim -> Sysmex UF-100
- Stago STA4 with Robotic Interface
• Capital Equipment Planning
  - Instrument lifespan decrease as workload increases
  - Methodology changes
  - Vendor / Client business relationship changes
  - Leverage skill set within shrinking pool of Laboratory Technologists and Technicians

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<tr>
<th>Dynamic</th>
<th>Scalable</th>
<th>Reliable</th>
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<tr>
<td>Change Instruments</td>
<td>Double workload</td>
<td>Component redundancy mitigates downtime</td>
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<td>Change LIS</td>
<td>Stable FTE Count</td>
<td>Information Systems Interface - Simple &amp; Efficient</td>
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<td>Change Vendor Line</td>
<td>Increase Productivity</td>
<td>Lab Assistant’s maintain system</td>
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<td>Consolidation in platform or test grouping / specimen</td>
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<td>Multi instrument / zone targeting</td>
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Specimen Arrival
Get the Stats
Specimen Count per Hour
Specimen Count per Day
Specimen Count per Year

Workload & TAT
Plan for Growth
2002 - 5,000 specimens/day
2012 - 10,000 specimens/day
Service Level Agreements
CBC's 90% reported in 30 min or less
PTCs reported by 10PM
General Chemistry
Hematology
Immunohematology
Urinalysis
Special Chemistry / Tox / Molecular
Molecular Biology

Workload Distribution

“Use of Open Automation has provided a solution to evolving technologies offered by a changing vendor pool resulting in the best value in laboratory medicine”