Does Modular Pre-Analytical System Improve Lab Efficiency?

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Introduction

In January 2017, the Pathology Lab introduced the Modular PreAnalytics EVO (MPA) to our process of aliquoting and testing specimens. Previously, all specimens were spun and aliquoted manually, leaving room for error and large variability in specimen turnaround time (TAT) from login to result. It was a significant investment and it entailed major workflow changes. We undertook an analysis to determine if there was definite improvement before and after installation. Challenges included frequent breakdowns, jams, and bottlenecks. These problems added to the TAT of results to clinicians, which could impact patient care. To address this problem, we examined the entire process from when a specimen arrives in the lab, to when a result is obtained. With efficiency and waste reduction in mind, we began observed and mapped the pre-analytic testing process.

Project Goal

1. Examine the effectiveness of the MPA.
   A. Average TAT before and after implementation
   B. Success rate before & after implementation (Success = % of Routine specimen TAT < 240 mins)
2. Understand and attack persistent problems in workflow.

Understanding the Process

Process Map
To fully understand the process, we outlined all flows of a specimen in the lab from entry to result.
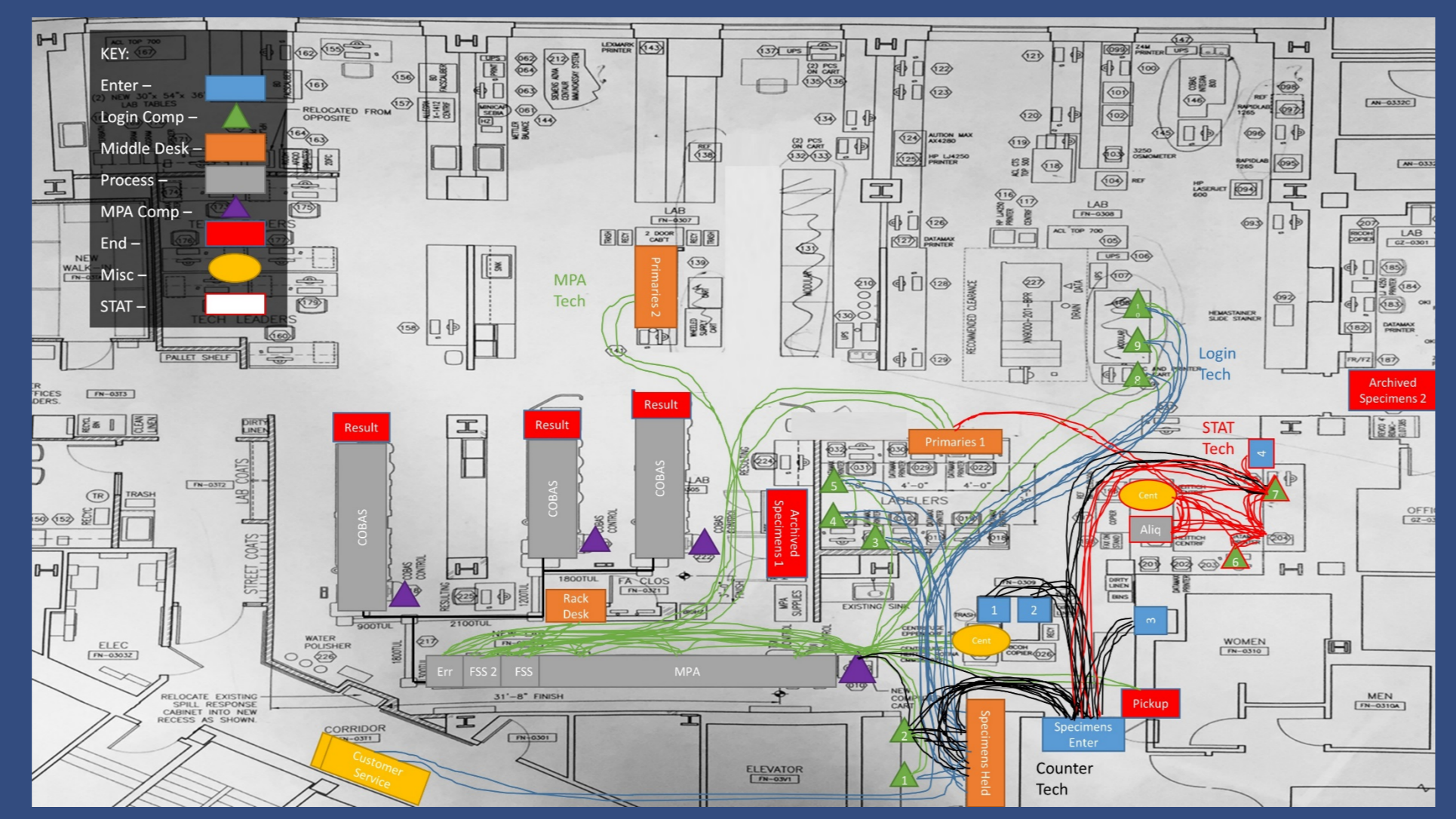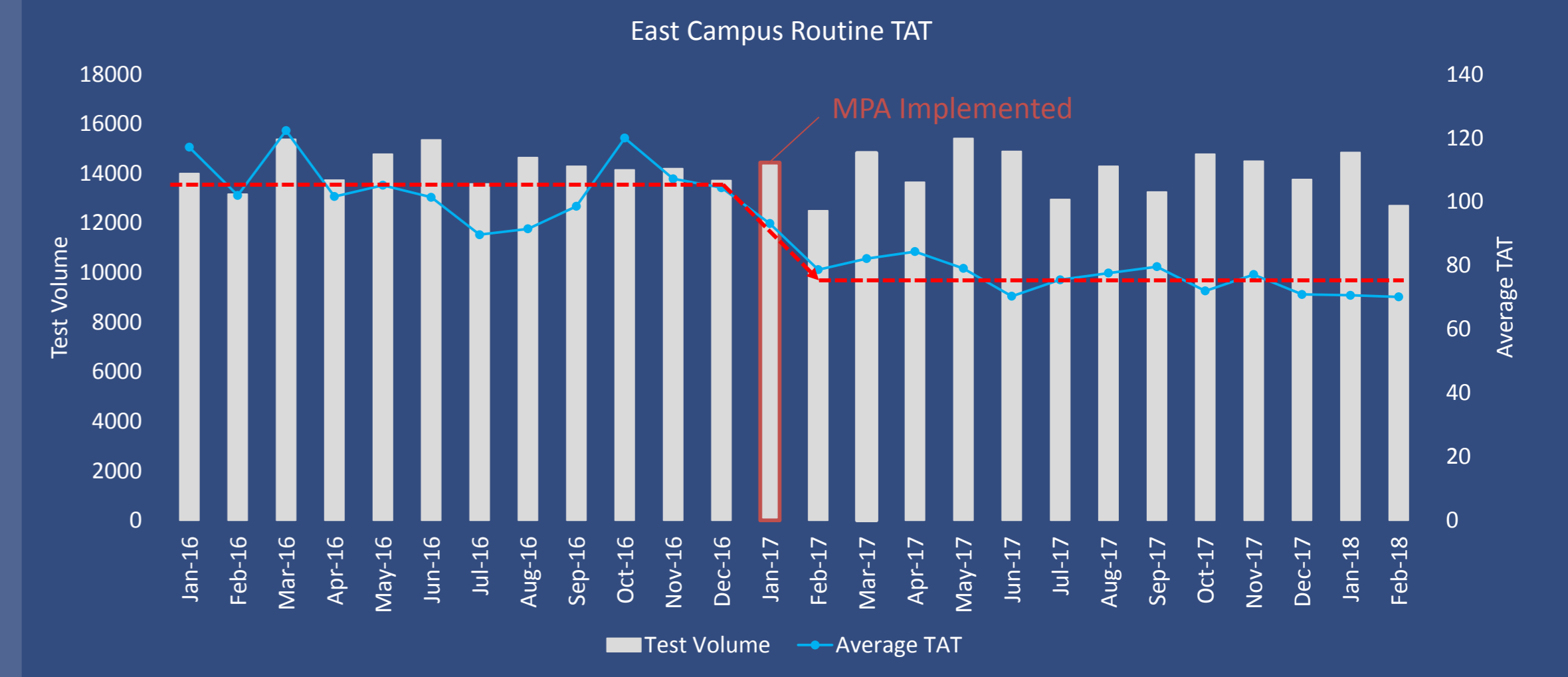

Spaghetti Diagram
The Spaghetti Diagram shows the path of workers throughout the process. More lines mean more movement.
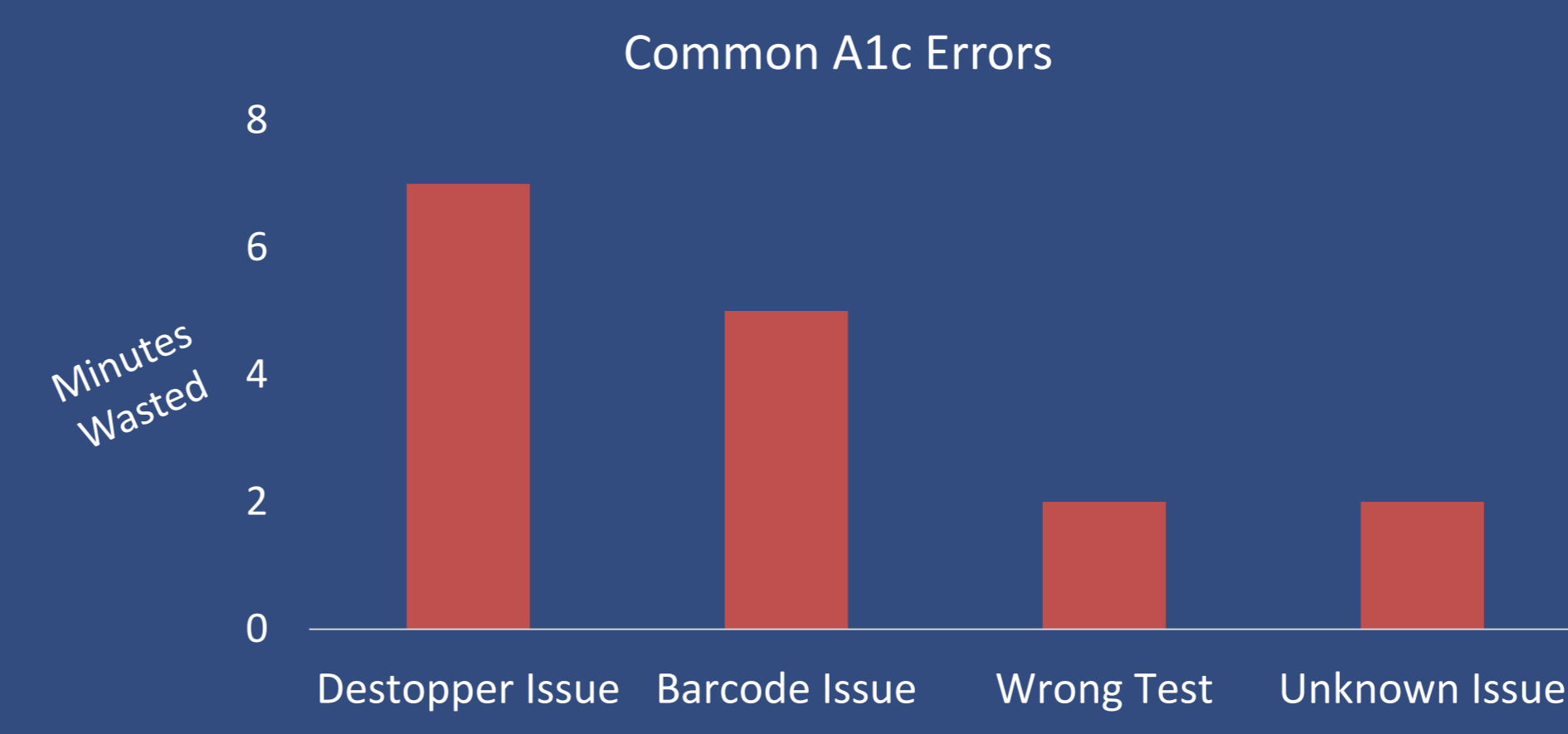
Data Collection

➤ **Time Studies** – We developed a time study tool to collect data on the time for individual steps in the process (Login Times, MPA Times, Counter Times, Delivery Times, etc.). An example is provided on the right.

	A	B	C	D	E	F	G	H	I	J	K
1	Rack #	MPA	Centrifuge	Destopper	Alliquoter	Labeler	Restopper	P/A	End	Kicked to Error	Picked from Error
2											
3											

➤ **Access Database** – Aside from collecting data ourselves, we pulled data from our database using SQL queries. This was mostly TAT data to determine our monthly performance.

East Campus Routine TAT

Results/Progress to Date

Common A1c Errors

Task	Electronic Order (mins)	Manual Requisition (mins)
Unbagging	0.20	0.25
Logging	0.43 (0.50)	1.25 (2.50)
Labeling	0.30 (0.50)	0.50 (1.50)
Discarding	0.05	0.05
Other	0.15 (0.05)	0.15 (0.05)
Total	**1.13** (1.07)	**2.20** (4.07)

Our data collection has led us to several major findings. Routine TATs have decreased by over 30 minutes. Lower variability and higher success rates confirms that the installation of the MPA has increased efficiency. However, there is still work to be done. A few workflow observations are listed above, but there is still more to uncover. With this information, we should be able to pilot and track changes to the process to see if these changes result in sustainable success.

For more information, contact:

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