OR KPI Self-Service Reporting

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ABSTRACT

With operating rooms being one of the top revenue sources in the acute-care setting, it is crucial to monitor key performance indicators (KPIs) such as case volume, room turnover, and block utilization in order to maximize efficiency. Putting such data in the hands of perioperative leaders empowers them to pivot quickly based on up-to-date operational data. We present our collaborative effort in creating a one-stop solution for OR KPIs as a case study in increasing self-service reporting capacity while lowering technical debt to meet a large academic organization's data demand. We discuss the major access barriers to data that motivated this effort and our objectives. The implementation steps and user experience designed to meet those goals are demonstrated. We quantify the success in building a self-service data consumer community as well as in lowering technical overhead and debt. Finally, we look to the future for meeting business challenges and opportunities for our organization.

MOTIVATION

- A large body of duplicate legacy reports with conflicting business logic and little documentation, leading to out-of-sync operational data

- Long queue for analytics resources resulting in long turnaround time for ad-hoc data request that are often time-sensitive

- High overhead for IT to maintain legacy reports while meeting ad-hoc demands, especially during major Epic version upgrades

GOALS

- **Increase self-service reporting capacity & lower access barrier to data**

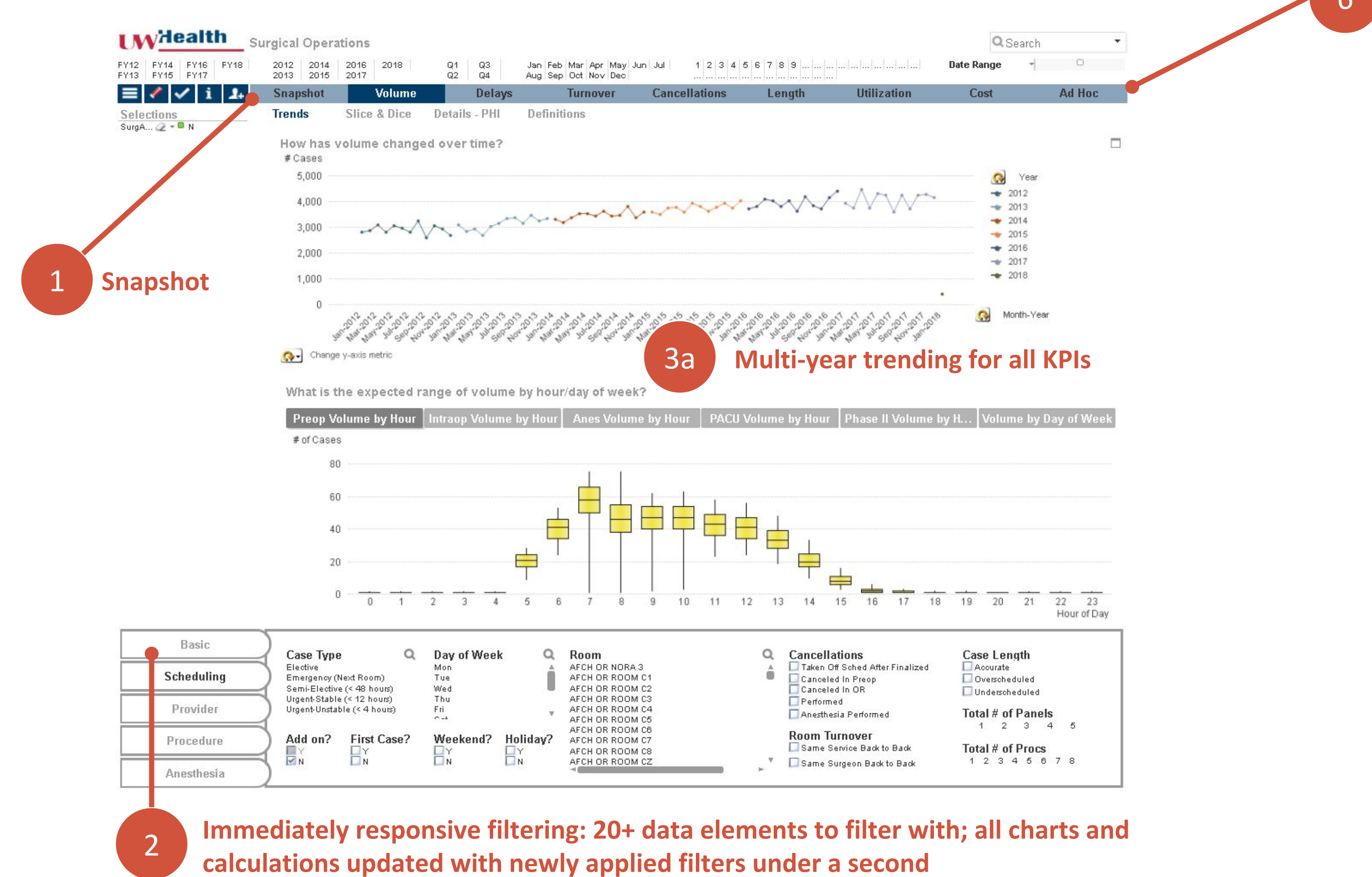- **Lower technical overhead to meet operational data demand**

IMPLEMENTATION

4. Presentation layer (continued): designed for optimal self-service data consumer experience

1 Snapshot

3a Multi-year trending for all KPIs

2 Immediately responsive filtering: 20+ data elements to filter with; all charts and calculations updated with newly applied filters under a second

6 Ad-hoc query generation in 3 steps:

6a. Select data elements to include in the exportable output.

6b. Select any KPIs to include in the output.

6c. Right-click on output and export to Excel.

1 Snapshot: at-a-glance summary of KPIs

MTD vs LMTD	415 Cases ▼ 6%	45% Late ▲ 3% pt	00:25 Avg Rm Turnover ▼ 6%	% Block Utilization ▲ 6 pt	$283,424 Supply/Implant Cost
Last Month vs Month Previous	4,145 Cases ▼ 3%	44% Late ▼ 3% pt	00:27 Avg Rm Turnover ▼ 0%	% Block Utilization ▲ 6 pt	$5,690,827 Supply/Implant Cost ▲ 19%

3b Drill-down & definitions: for every KPI, drill down to case-level details for validation or follow-up; all relevant terms and metrics defined in-app

3c Slice & dice: all KPIs stratified by 10+ data elements
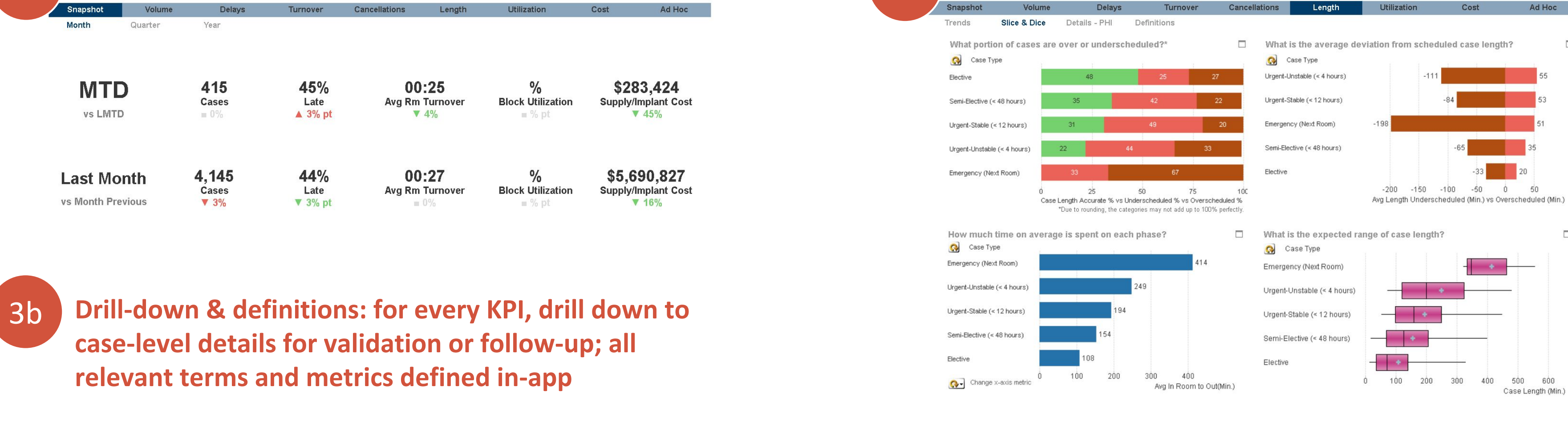
IMPLEMENTATION

1. KPI definitions reviewed and approved by perioperative leadership:

Case Volume	On-Time Starts	Room Turnover	Cancellations
Block Utilization	Case Length Accuracy	Supply/Implant Usage	Supply/Implant Cost

2. KPI definitions and business logic implemented/defined within Epic Hyperspace by OpTime application team

3. Data model created in Epic Clarity database by analytics team

4. Presentation layer implemented as a QlikView application by analytics team

RESULTS

- Active self-service user community:
  - **180 unique users accessed the application 1,958 times** in 2017, spending 37 minutes and making 8 clicks on average per session

- ROI from scaling ad-hoc reporting:
  - **1,050 datasets generated** & exported by users in 2017

- Low maintenance overhead for IT
  - Only a single post-upgrade issue with application across two major Epic version upgrades; configuration in Epic Hyperspace automatically triggered addition of a new surgery center's data without any involvement from analytics team.

- Technical debt reduction
  - 50 individual Crystal reports retired, more slated for evaluation

FUTURE

- Personalization & simplifying data access
  - Automatically filter down to login user's dataset (e.g. surgeon's own KPIs)
  - Embed the application, currently hosted in web, into Epic Hyperspace for seamless integration with the rest of the clinical workspace
  - Create a link to another QlikView application focused on anesthesia quality measures, bridging the gap between operational and clinical datasets

- Support business ventures & standardization initiatives
  - Incorporate another acute care hospital's surgical center with minimal configuration
  - Provide preliminary analysis to further standardize KPI definitions across multiple locations
  - Identify opportunities for practice variation reduction in supply usage and cost saving initiative