Driving Insights, Driving Value: Boosting Clinical Registry Value using ARMUS Solutions

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ARMUS Overview

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ARMUS Solutions

Clinical Registry Software Solutions

- HYBRID Outcomes - Streamlined and customizable data entry
- HYBRID Analytics - Comprehensive reporting
- Interface Applications - Reduced data burden
- MIPS Submit - Quality measures to CMS

Data Abstraction and Management

- Reduce costs and improve outcomes

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ARMUS Benefits

- ✓ Improved data quality
- ✓ Reduced data abstraction time
- ✓ One patient-centric application for all clinical registries
- ✓ Meaningful reporting to drive improved clinical outcomes
- ✓ On-demand and longitudinal analytics (spanning all data versions)
- ✓ Technology + Cloud-based solution supports rapid registry development
- ✓ Minimal Hospital IT Requirements

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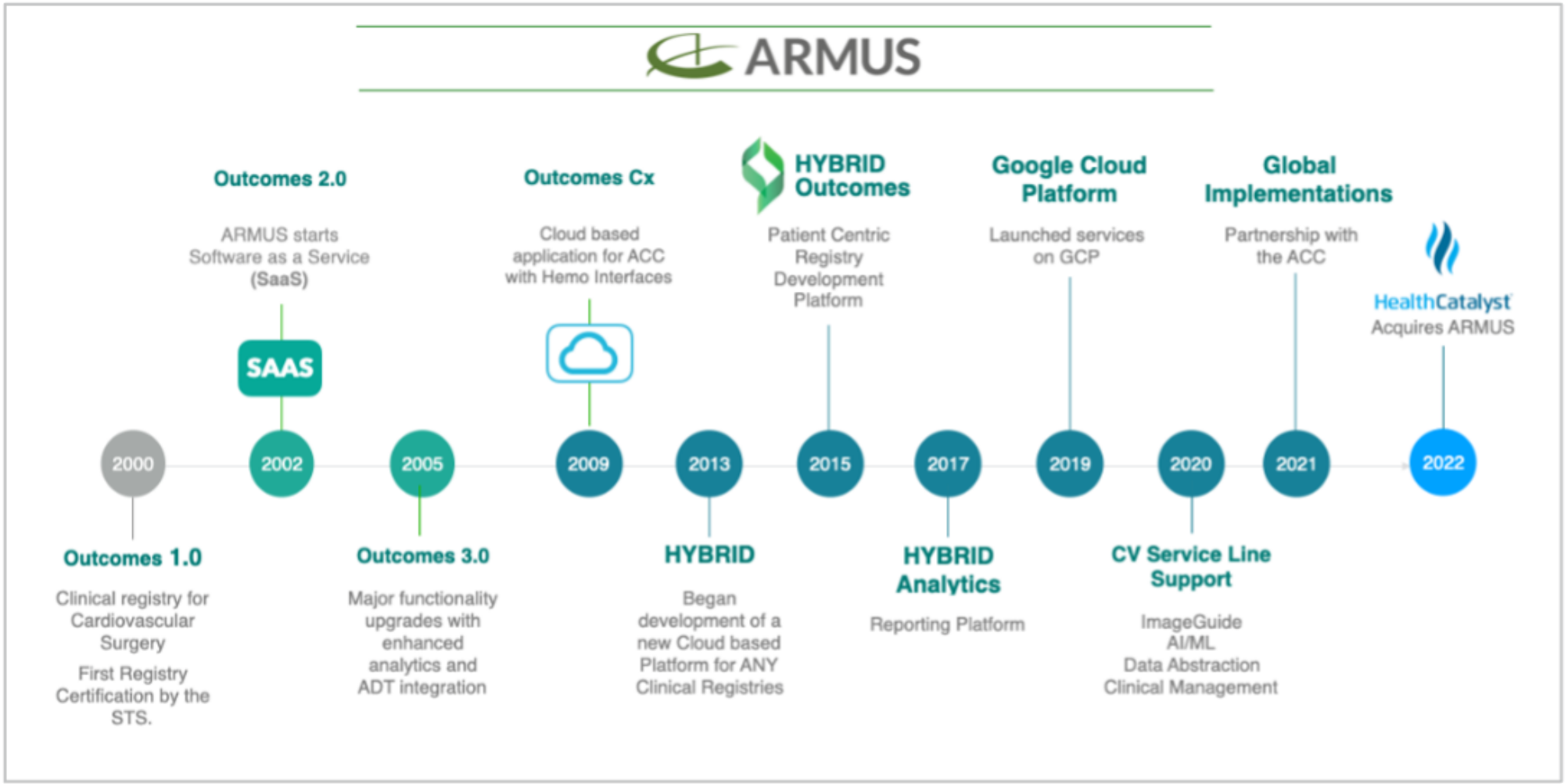

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ARMUS Hybrid Rapid Registry Development Platform

Specifications → Metadata File

Manual Data Abstraction

AND / OR

CLINICAL Interface

Hospital builds output based on ARMUS Specifications

AND / OR

Cardiac Cath Lab

Data entered into Hemodynamic Monitor by Cath Lab Staff

AND / OR

ADT Feed

```
MSH|^~\&|ADT1|MCM|LABADT|MCM|
198808181126|SECURITY|ADT^A01|
MSG00001-|P|2.6
EVN|A01|198808181123
PID|||PATID1234^5^M11^^AN||JONES^
WILLIAM^A^III||19610615|M||2106-3|
677 DELAWARE AVENUE^^EVERETT^MA^
02149|GL|(919)379-1212|(919)271-3
```

Stream Manager

Hospital Directory File Storage Set to Auto-Transmit to **ARMUS SFTP**

ARMUS Device Interface
(Hemodynamic or XML)

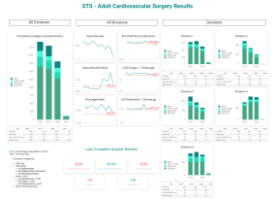
HYBRID Outcomes Registries

Procedure Data

- Collection
- Validation
- DQR
- Harvesting

HYBRID Analytics

- Ad-hoc
- Standard
- StarMetrix
- Dashboards
- MIPS Submit



To National Registries
STS, ACC/NCDR, AHA

To CMS

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Hospitals & Hospital Systems

500 Hospitals with over 4500 Users

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ARMUS Supported Registries

Clinical Registries Supported by ARMUS		
National Society Registries	**State Initiative Registries**	**Society Technology Partnerships**
ACC-NCDR AFIB	NY State PCIRS (PCI)	**Sub-Specialty Society Registries**
ACC-NCDR CathPCI	NY State CSRS (Adult Cardiac Surgery)	ImageGuide Transthoracic Esophageal
ACC-NCDR Chest Pain MI	NJ State Cardiac Cath (PCI)	ImageGuide Stress Echo
ACC-NCDR EP Device Implant	NJ State Open Heart Surgery	ImageGuide Nuclear
ACC-NCDR IMPACT	CA State CCORP (Adult Cardiac Surgery)	**International Registries**
STS/ACC TVT	GA State CV Disease Program - CathPCI/CPMI (Export Only)	ACC Global Quality Initiative CathPCI
AHA GWTG-CAD	MA State Adult Cardiac Surgery (Export only)	ACC Global Quality Initiative CPMI
AHA GWTG-Heart Failure		ACC Global Quality Initiative GHATI
AHA GWTG-Stroke		**Quality Collaborative Registries**
STS Adult Cardiac Surgery		PERForm (owned by MSTCVS**)
STS Congenital Heart Surgery		OB COAP (Owned by FHCQ*)
STS General Thoracic Surgery		SCOAP (Surgical Care and Outcomes Assessment Program) (Owned by FHCQ*)

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*FHCQ: Foundation for Healthcare Quality, Washington
**MSTCVS: Michigan Society of Thoracic and Cardiovascular Surgery

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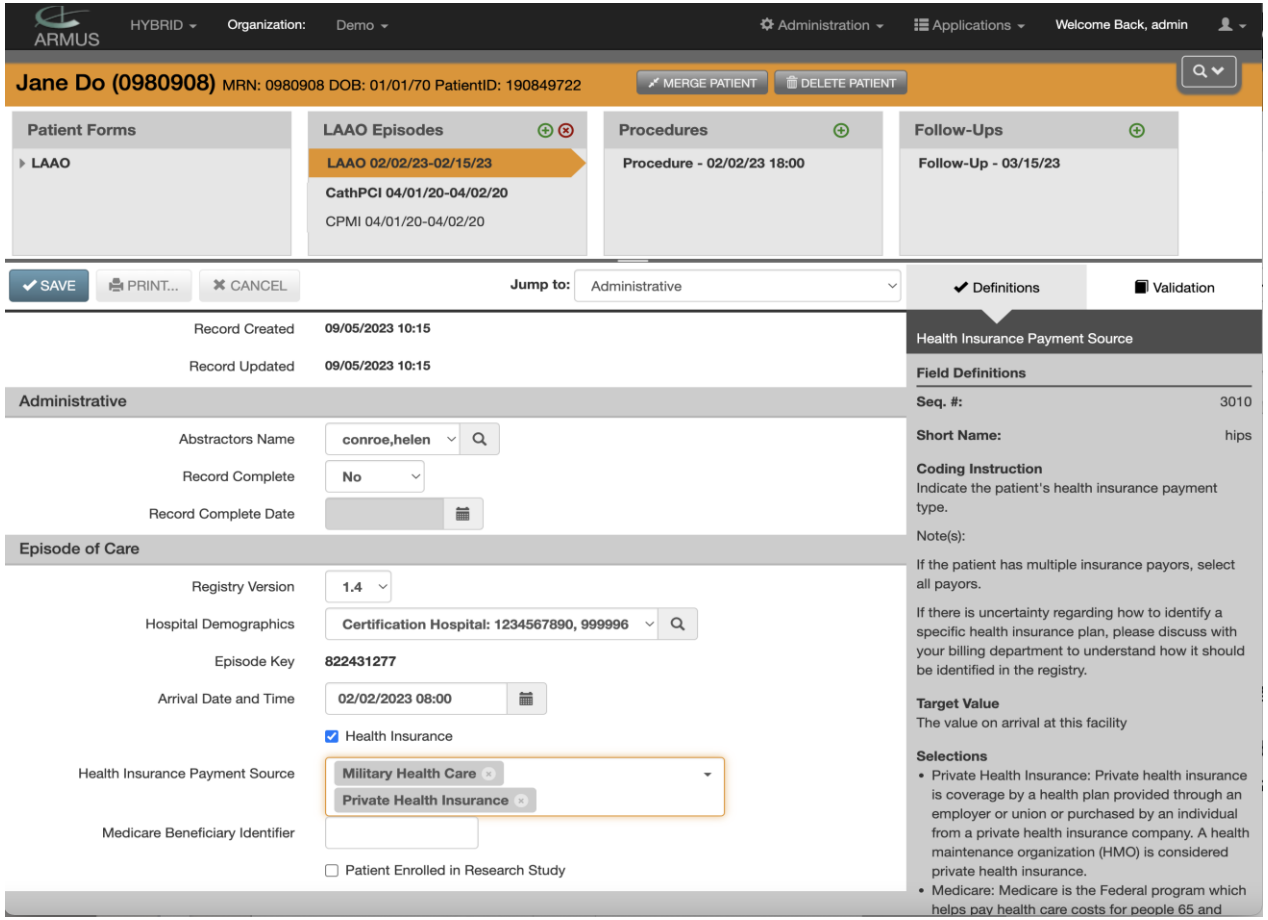
1st Certified Vendor for LAAO*

“One patient-centric solution for all of your registries.”



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Poll Question 1:

What is your biggest challenge in managing your clinical registry participation?

A. Data abstraction - too time-consuming
•B. Providing reports to stakeholders - wish it were easier
•C. Meeting Data Submission Deadlines is a challenge
•D. Not Applicable - I do not participate directly in clinical registries

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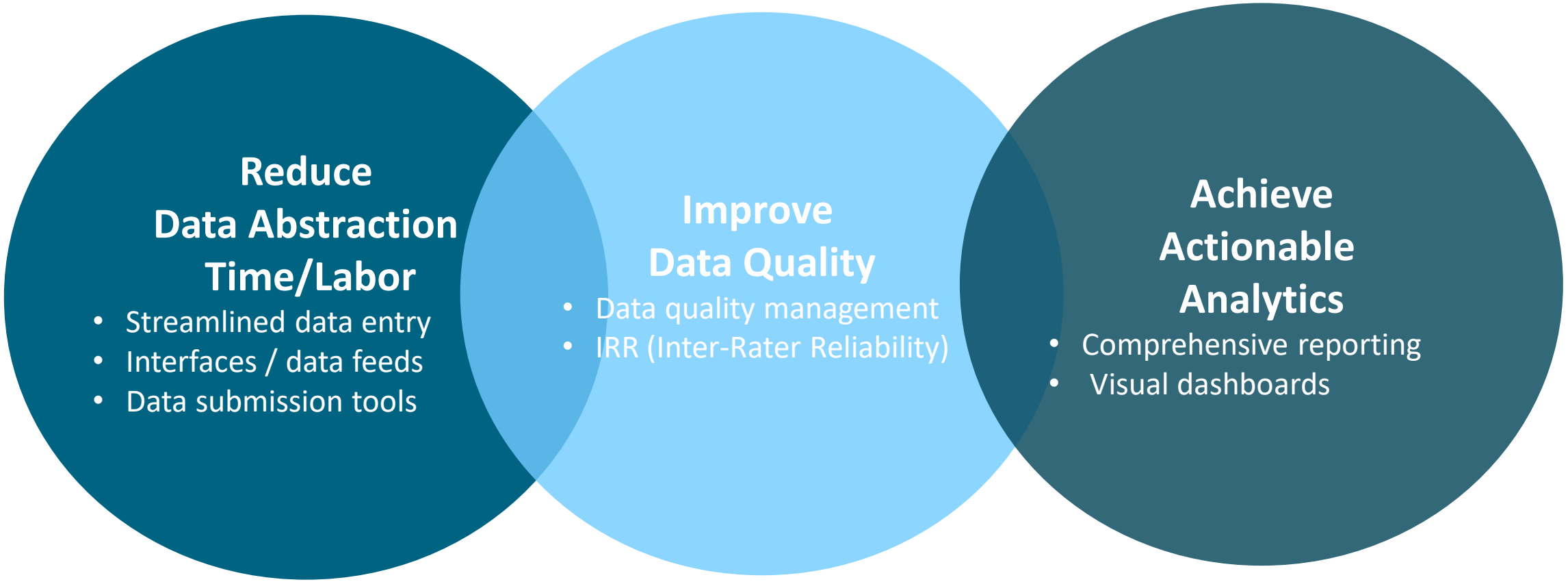
Drive Insight and Value with ARMUS Solutions



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Benefits of Interfacing

Utilizing Interfaces = ↓ Abstraction Time + ↑ Data Quality

Supported Interfaces:

- Hemo
- ADT
- Clinical Importers (any registry)

Supported hemodynamic monitoring systems

- GE MacLab
- Phillips (XPER, WITT)
- MERGE
- Mckesson
- Siemens
- FUJI
- and other custom interfaces

Interfaces + Cross Registry Mapping

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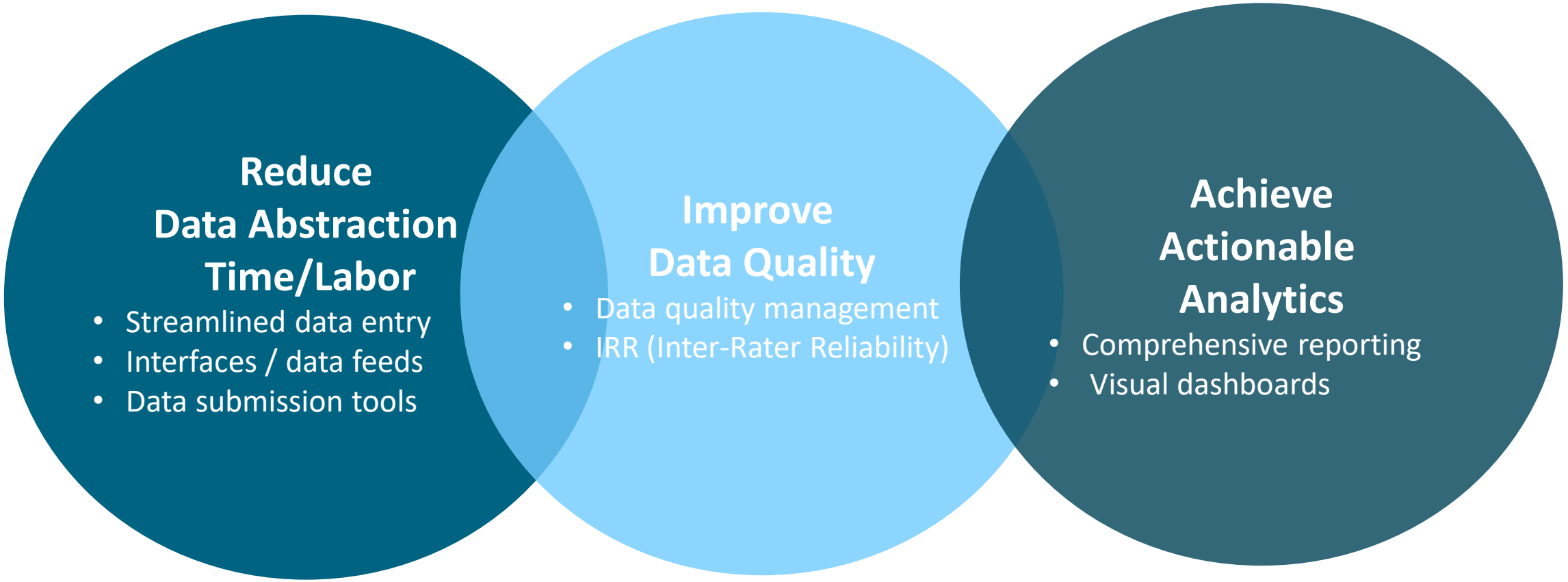

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- **Poll Question 2:**

How do you perform IRR for your registries today?

(inter-rater reliability for data abstraction audits)

- (answer options: A. Paper, B. Electronic, C. Not currently doing but would like to, D. Not Applicable)

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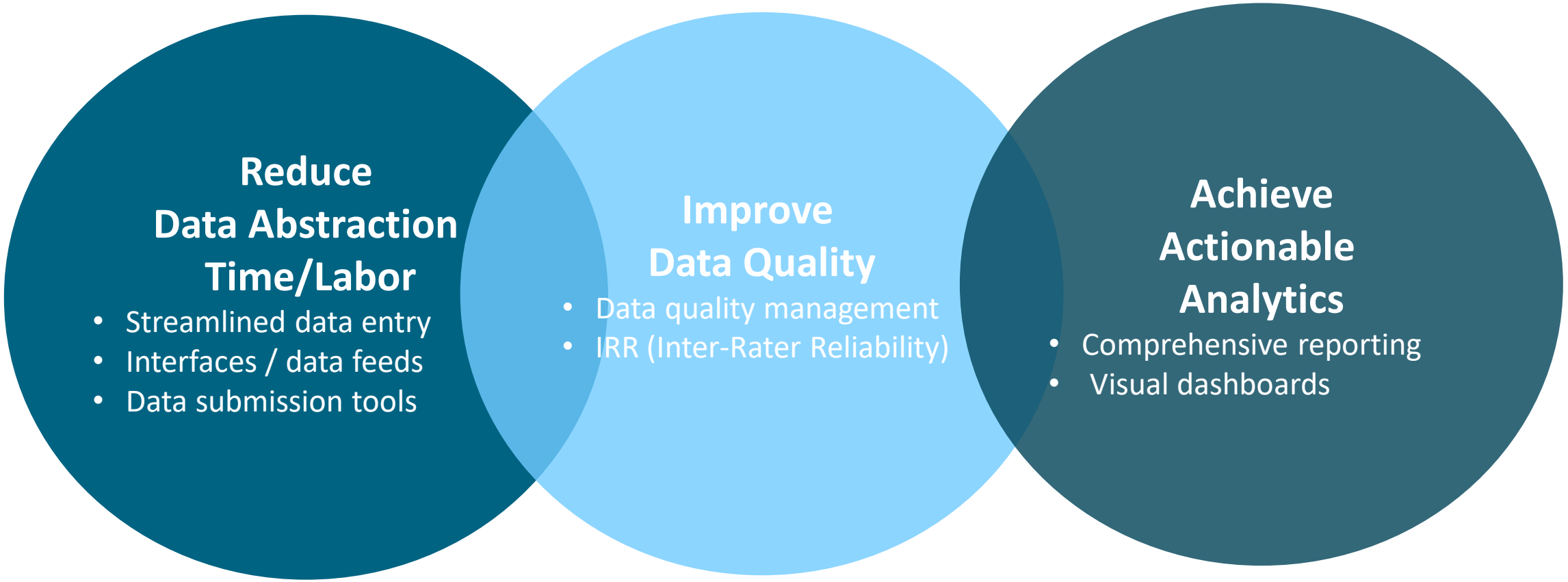

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A Health Catalyst Case Study

Electronic Data Abstraction Improves Efficiency and Registry Submission Accuracy

ARMUS by HealthCatalyst®

Participation in the Society of Thoracic Surgeons (STS) Adult Cardiac Surgery Database (ACSD) National Database is a key component of Johns Hopkins Medicine's cardiothoracic surgery quality performance program. The organization leveraged ARMUS by Health Catalyst to reduce its registry data entry burden and simplify registry data management, achieving improved efficiency and data quality, reducing data cleaning, and lowering missing data rates.

Challenges & Impact

- Participation in the program required the organization to invest costly resources to accurately abstract, validate, and submit quality data.
- **Impact:** Johns Hopkins Medicine wanted to pursue options that would allow it to improve efficiencies while maintaining high-quality performance.

Solution

- Leveraged ARMUS by Health Catalyst to reduce its registry data entry burden and simplify registry data management.
- ARMUS Clinical Registry cloud-based application streamlines the data collection, validation, and submission process.
- The organization can now use its resources to measure, analyze, and continually improve performance rather than spending limited resources on data abstraction.

Results

- **69 ACSD registry fields** automatically imported.
- **12-15 minutes** in abstraction time saved per record.
- **10-25 percent reduction** in abstraction time.

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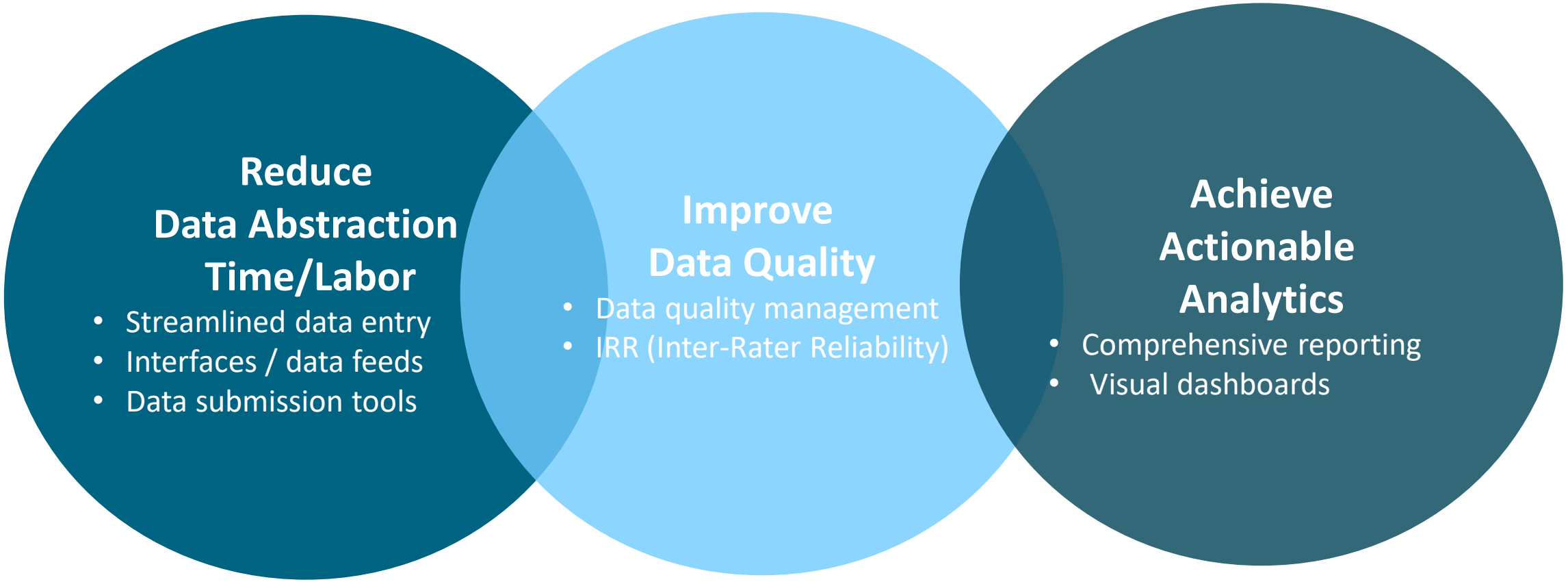

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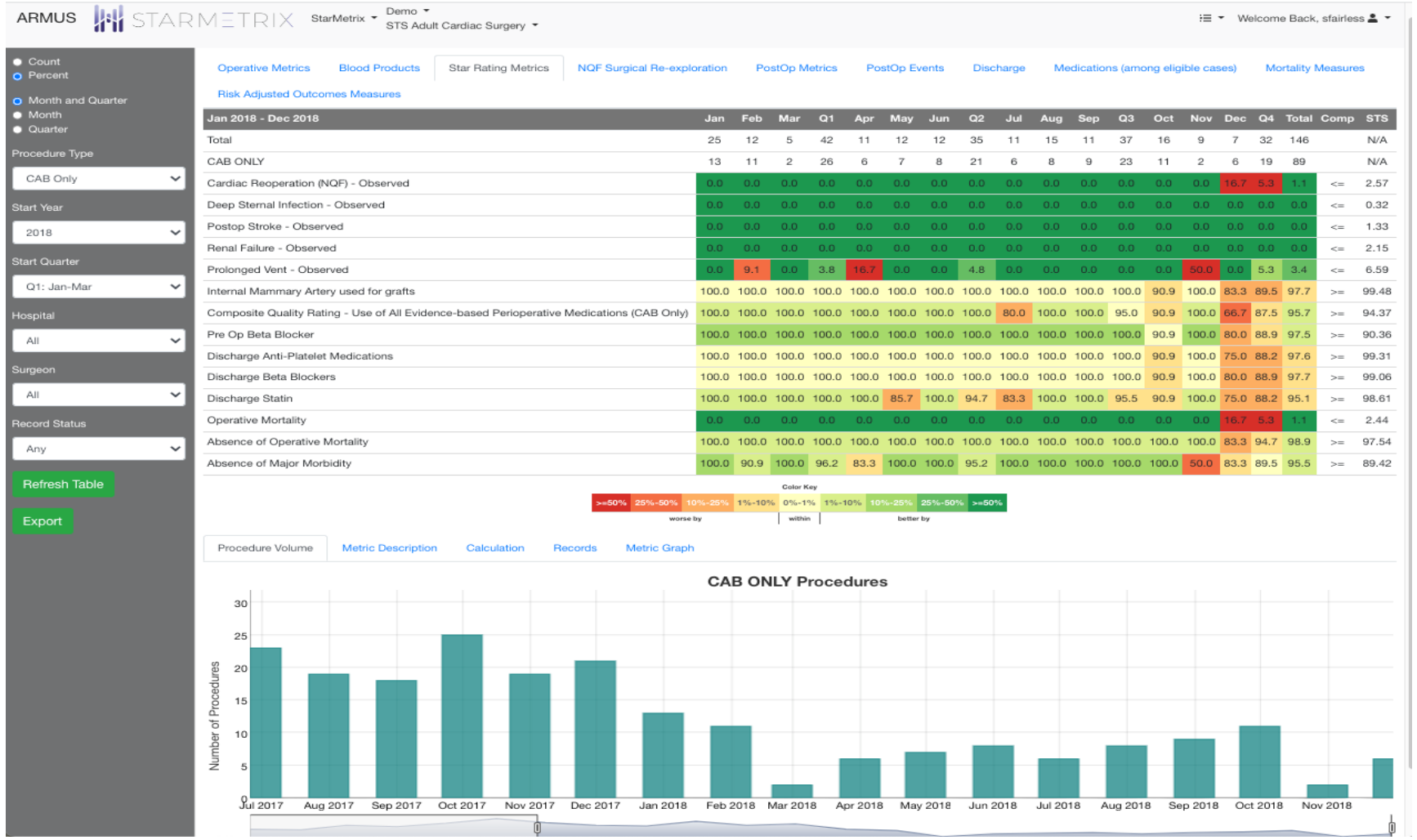
StarMetrix – The fastest way to prep for M&M meetings



Jan 2018 - Dec 2018	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	Total	Comp	STS
Total	25	12	5	42	11	12	12	35	11	15	11	37	16	9	7	32	146		N/A
CAB ONLY	13	11	2	26	6	7	8	21	6	8	9	23	11	2	6	19	89		N/A
Cardiac Reoperation (NQF) - Observed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	5.3	1.1	<=	2.57
Deep Sternal Infection - Observed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<=	0.32
Postop Stroke - Observed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<=	1.33
Renal Failure - Observed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<=	2.15
Prolonged Vent - Observed	0.0	9.1	0.0	3.8	16.7	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	50.0	0.0	5.3	3.4	<=	6.59
Internal Mammary Artery used for grafts	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.9	100.0	83.3	89.5	97.7	>=	99.48
Composite Quality Rating - Use of All Evidence-based Perioperative Medications (CAB Only)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	80.0	100.0	100.0	95.0	90.9	100.0	66.7	87.5	95.7	>=	94.37
Pre Op Beta Blocker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.9	100.0	80.0	88.9	97.5	>=	90.36
Discharge Anti-Platelet Medications	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.9	100.0	75.0	88.2	97.6	>=	99.31
Discharge Beta Blockers	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.9	100.0	80.0	88.9	97.7	>=	99.06
Discharge Statin	100.0	100.0	100.0	100.0	100.0	85.7	100.0	94.7	83.3	100.0	100.0	95.5	90.9	100.0	75.0	88.2	95.1	>=	98.61
Operative Mortality	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	5.3	1.1	<=	2.44
Absence of Operative Mortality	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	83.3	94.7	98.9	>=	97.54
Absence of Major Morbidity	100.0	90.9	100.0	96.2	83.3	100.0	100.0	95.2	100.0	100.0	100.0	100.0	100.0	50.0	83.3	89.5	95.5	>=	89.42

Quickly identify areas of excellence as well as opportunities for improvement based on benchmarks. Metric definitions with patient drilldown.

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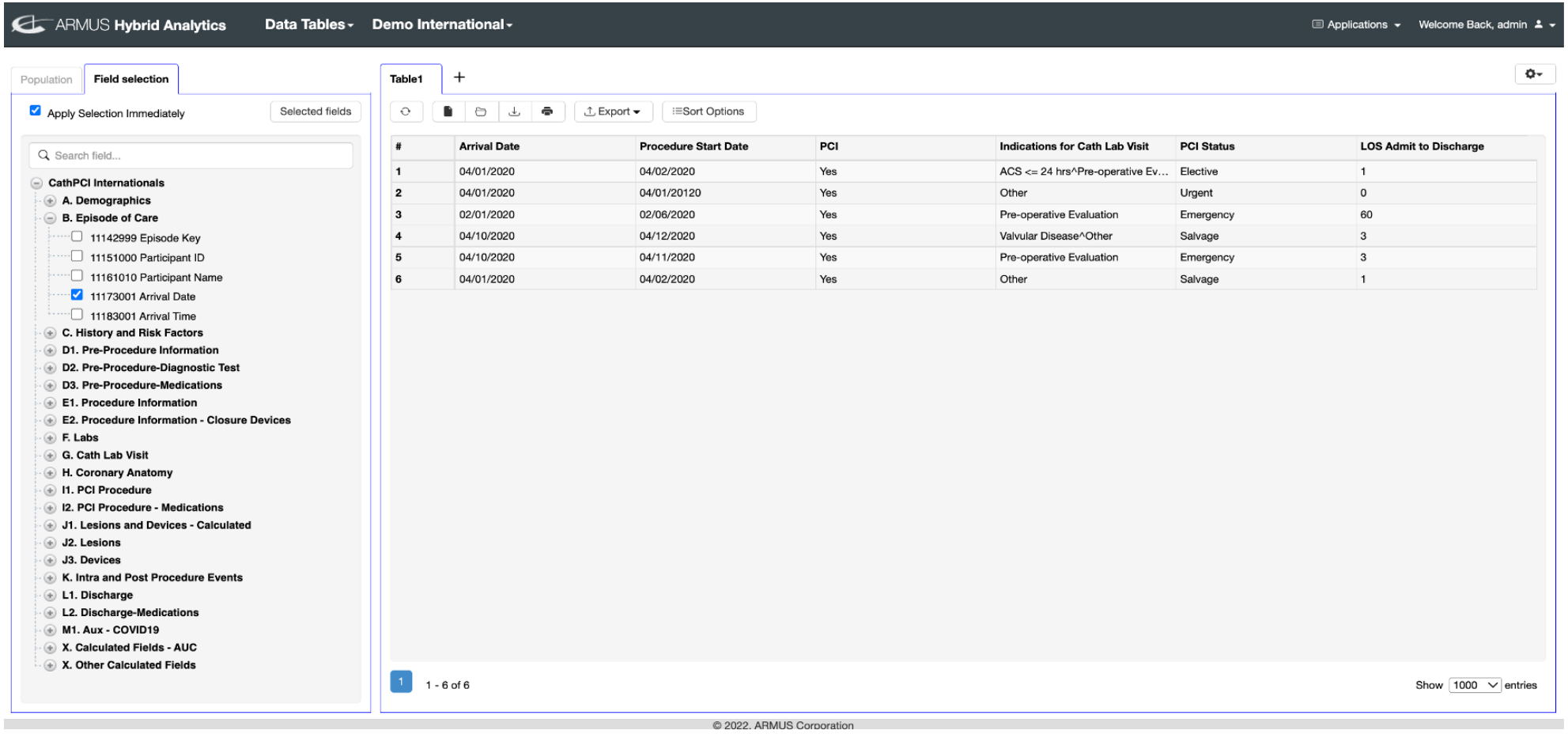
Data Tables



#	Arrival Date	Procedure Start Date	PCI	Indications for Cath Lab Visit	PCI Status	LOS Admit to Discharge
1	04/01/2020	04/02/2020	Yes	ACS <= 24 hrs^Pre-operative Ev…	Elective	1
2	04/01/2020	04/01/20120	Yes	Other	Urgent	0
3	02/01/2020	02/06/2020	Yes	Pre-operative Evaluation	Emergency	60
4	04/10/2020	04/12/2020	Yes	Valvular Disease^Other	Salvage	3
5	04/10/2020	04/11/2020	Yes	Pre-operative Evaluation	Emergency	3
6	04/01/2020	04/02/2020	Yes	Other	Salvage	1

"Ask your data: Use an Ad Hoc query builder to answer your own questions from all registry fields."

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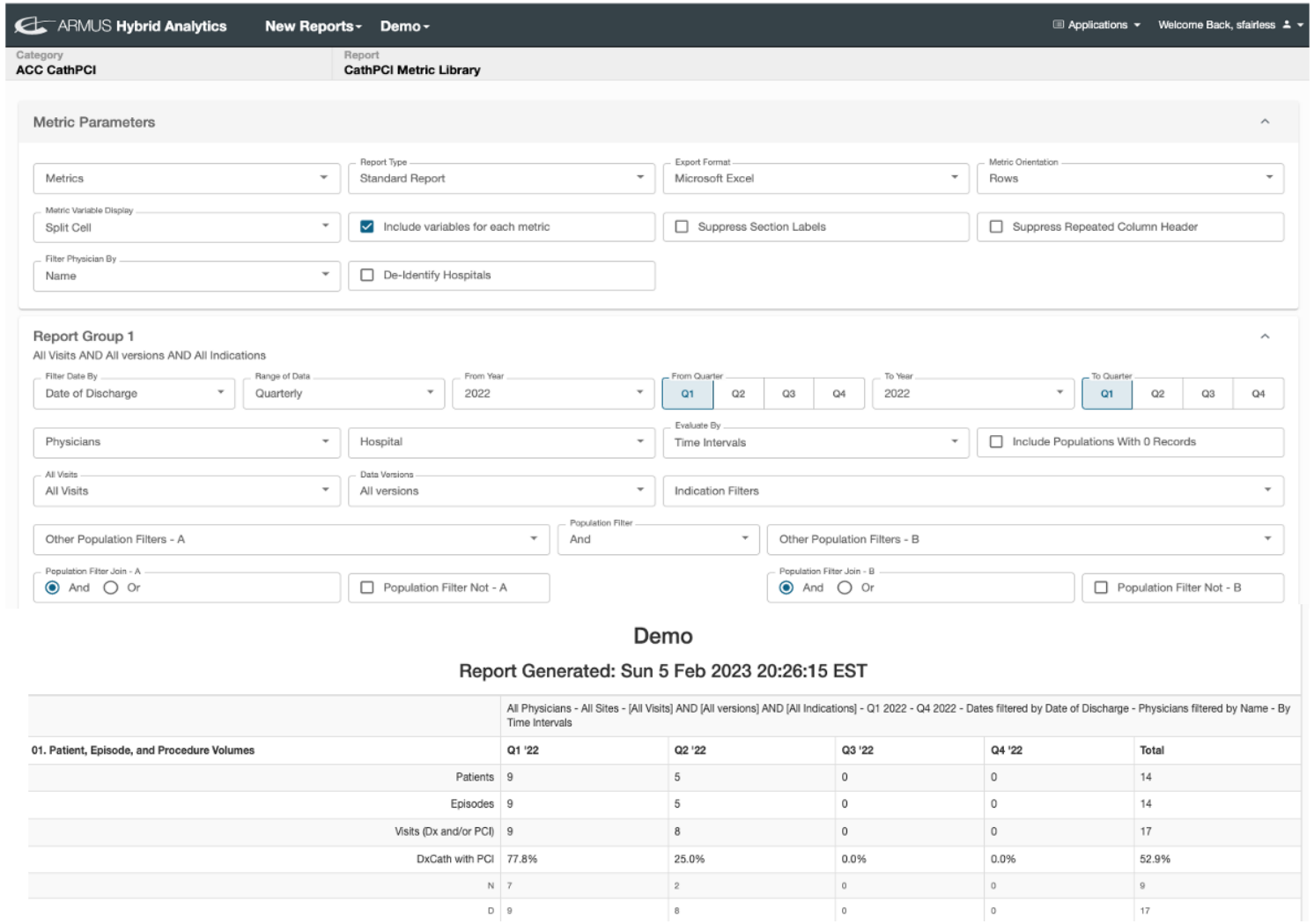
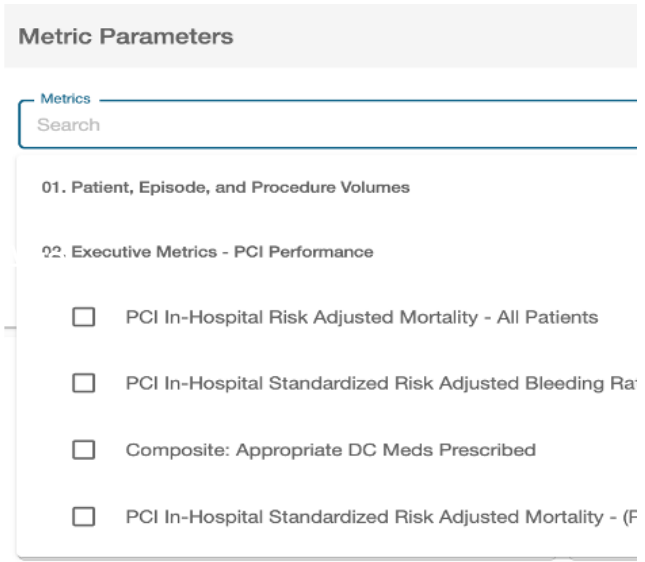
Metric Library



- Available for most registries
- Select specific metrics, parameters or filters
- Output grid or graphs, and can export to Excel or PDF



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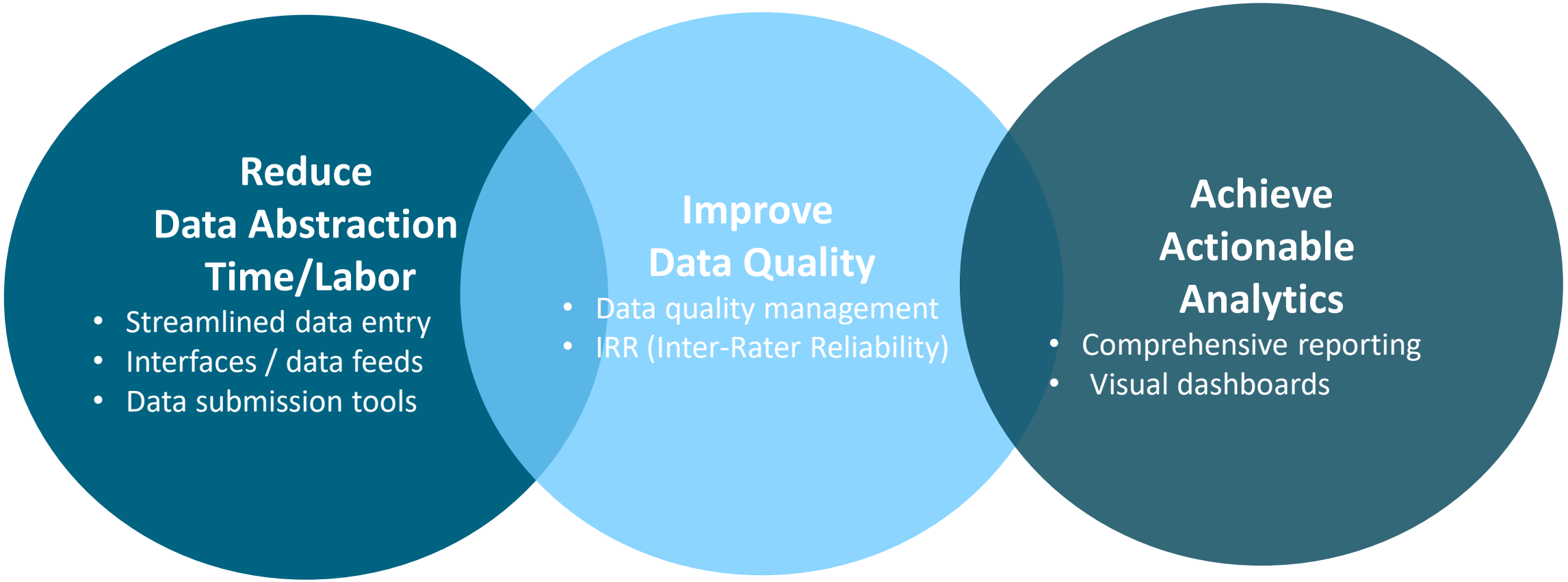

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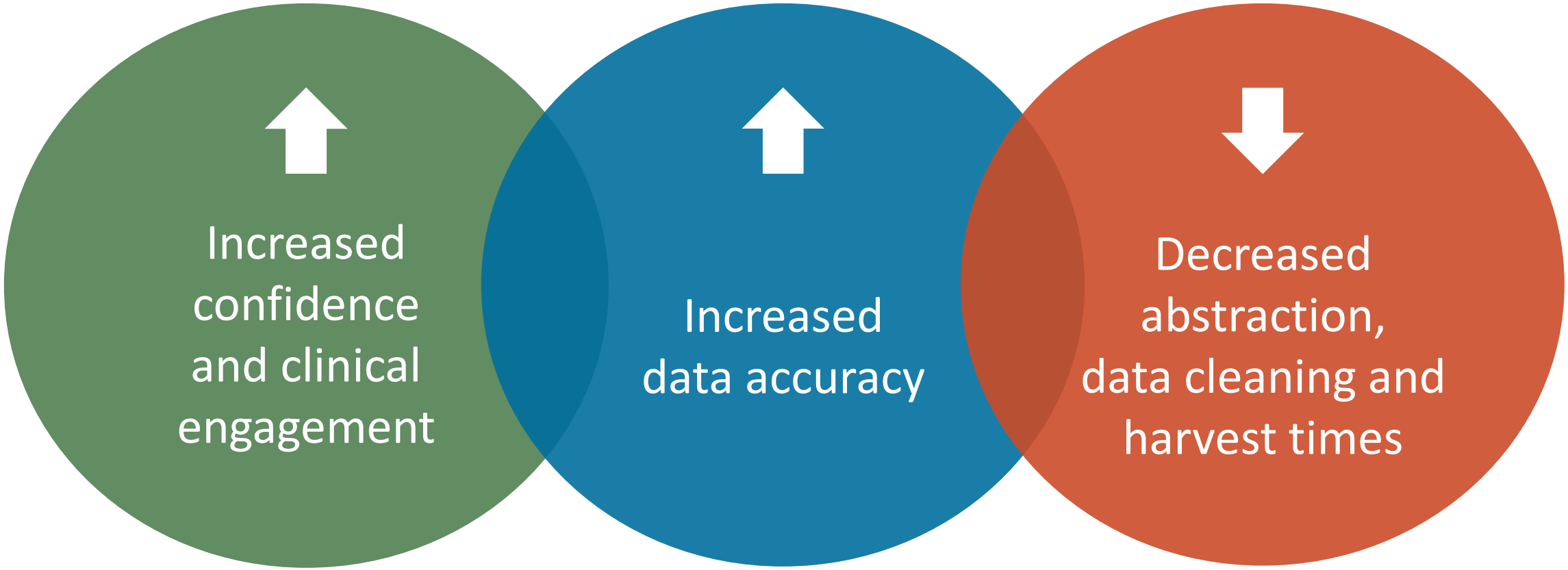
Meaningful Improvements lead to:



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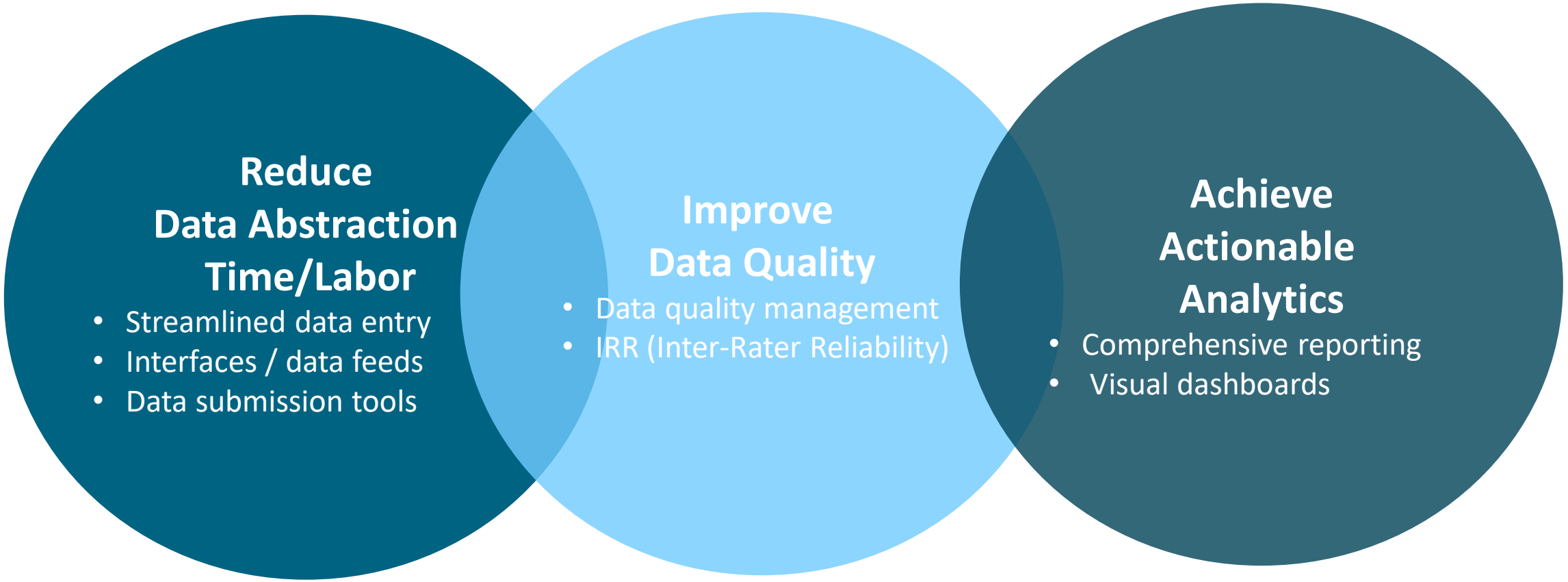

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Q & A

	Frequently Asked Questions	
1	Can you house my historic data, and will it be available for reporting?	Yes
2	How timely are you with new data versions?	1st
3	Do you have an IRR tool?	Yes
4	Do you have dashboard reporting?	Yes
5	Do you have patient detail reporting?	Yes
6	Do you have Data Quality Tools and Definitions available in your data entry?	Yes
7	Can I submit data from your tool?	Yes
8	Can you interface from our EMR or our CathLab?	Yes

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