Digital Strategy and Data Visualization for Clinical Quality Insights

Making the Case, Evaluating Options, and Designing Solutions to Optimize Your Registry Program – Lessons from the American College of Cardiology's NCDR Suite of Registries

Session Overview

Brief presentations followed by open discussion

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Disclosure Slide

The moderator and panelists for this session have no material financial relationships to disclose.

CMSS | Council of Medical Specialty Societies

CMSS Annual Meeting 2022
Specialty Societies: Stronger Together
November 9-11, 2022 | Washington, DC

Project Overview & Making the Case

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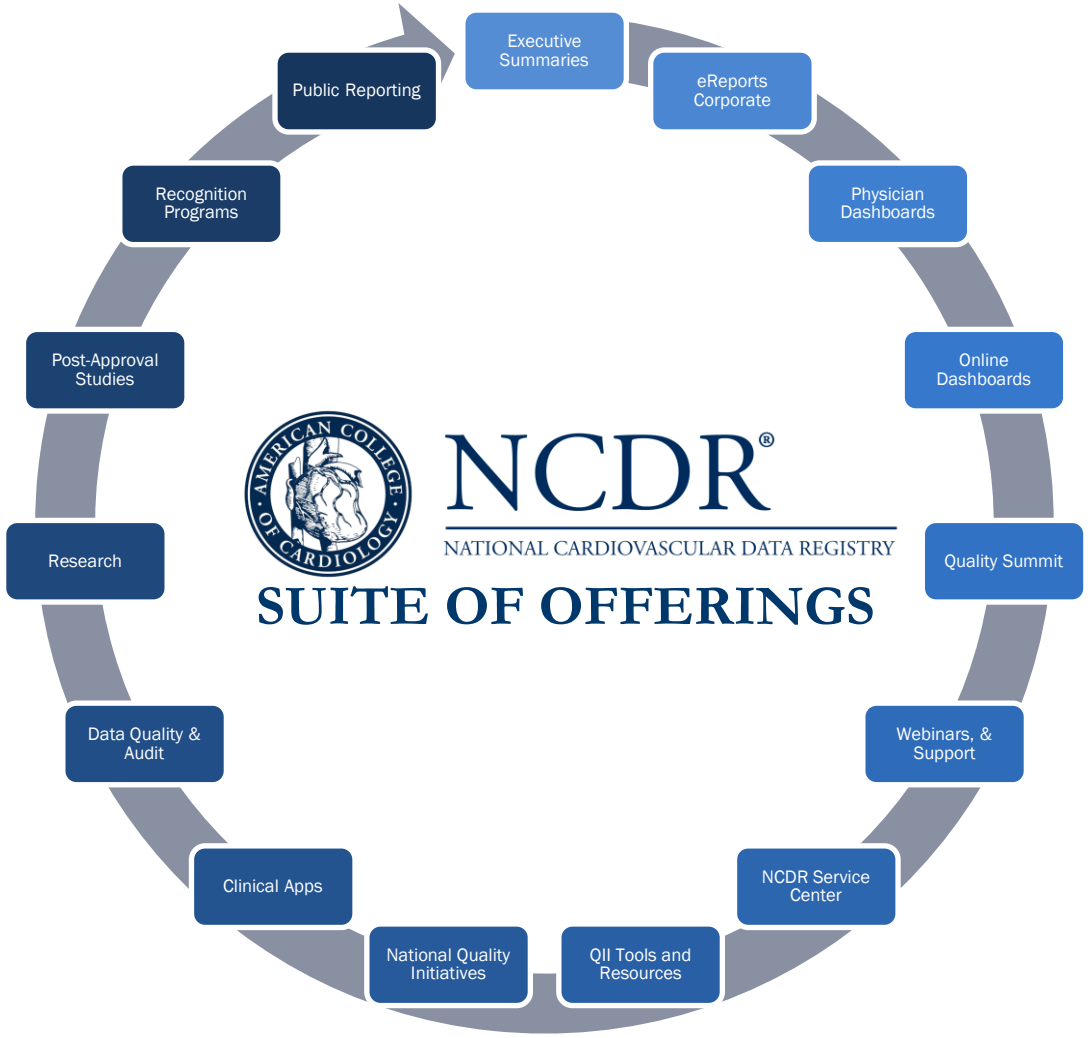
Kelly May

Consultant	Marketer	Founder	Trainer
IBM ZS	Amway	MAY STRATEGY GROUP	INNOVATOR'S DNA

accenture High performance. Delivered.
Founders Brewing
verizon connect
jonas paul
Hudsonville Premium Ice Cream Midwest Crafted Creamery Since 1926
Amway
AAOS American Academy of Orthopaedic Surgeons
American College of Cardiology
American Heart Association.
aahpm American Academy of Hospice and Palliative Medicine
ASAM American Society of Addiction Medicine
POSNA Pediatric Orthopaedic Society of North America
AIP American Institute of Physics
UT Health San Antonio
ASH Research Collaborative Accelerating Progress in Hematology
American Shoulder and Elbow Surgeons 1982
GIQuIC
Tolman's Meats
FULLBAR
OrthoRPM
ENVOYB2B
Rentberry

NCDR is the premier source for cardiovascular quality data



NCDR Overview

- Largest, most comprehensive, outcomes-based CV registry in the world
- Launched in 1997
- Ten registries
- 1,873 sites, 100M clinical records
- 80+ system contracts
- Recognized by Federal/State Government and private payers thanks to ACC Advocacy efforts

The NCDR of the Future

Vision: A world where NCDR advances patient care, outcomes, and value through knowledge and innovation.

The NCDR of the Future is:

To achieve this vision, it is critical to understand and navigate threats

Tech Companies

EHR Companies

Changing Customer Expectations

Hospitals & Industry Building Own Solutions

Example Threats to the NCDR

Dependent on New Med. Devices, Procedures

CMS & FDA Decisions

Policy Changes

MAY STRATEGY GROUP

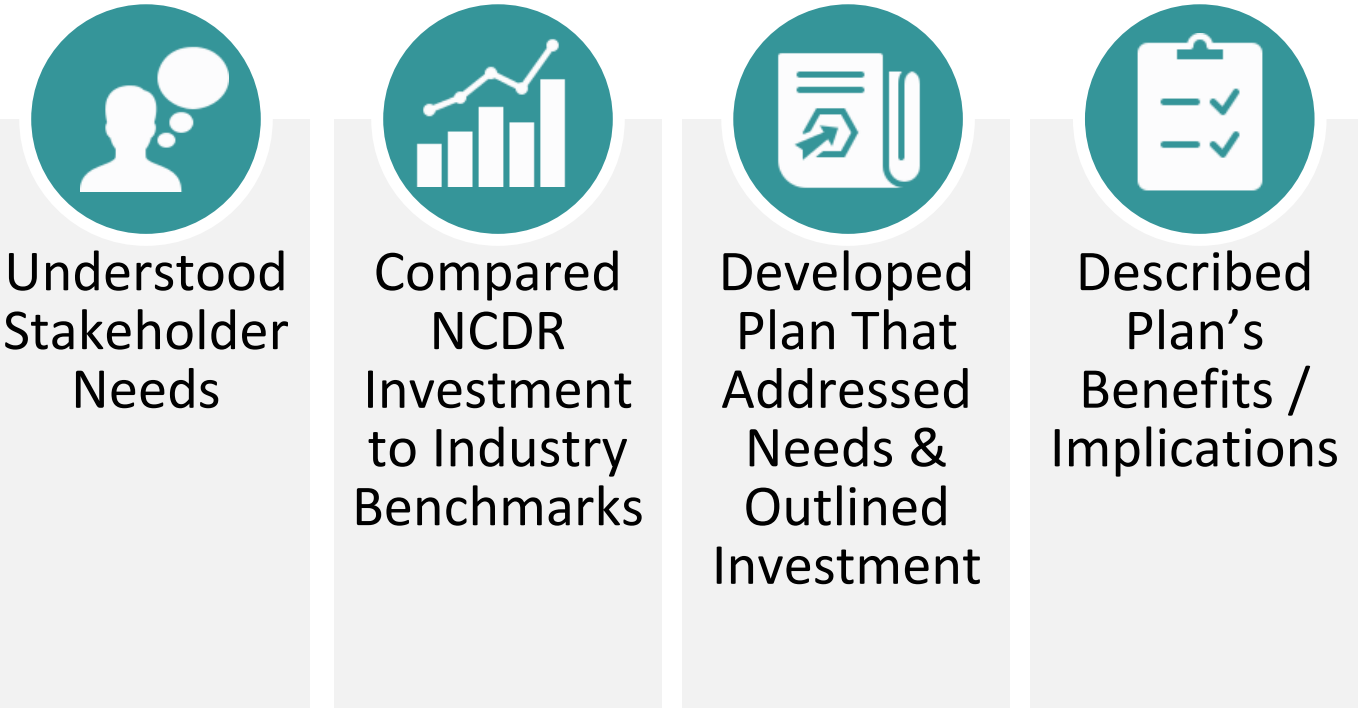
The NCDR kicked off an optimization project to ensure the registry was positioned for the future

NCDR Optimization Project Rationale

NCDR Optimization:
Optimizing NCDR requires maintaining our current state as a world leader in cardiovascular registries, while simultaneously developing the means of transforming operations to reflect the changing needs of our stakeholders and evolving capacity of technology

HOW WE MADE THE CASE:

Steps to Solidify Investment Support

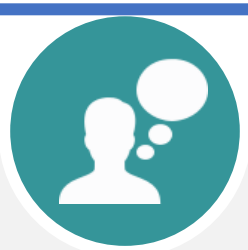


RESULT: A comprehensive, insight-led plan that received Board support and investment approval

MAY STRATEGY GROUP

HOW WE MADE THE CASE:

Steps to Solidify Investment Support



Understood Stakeholder Needs

Compared NCDR Investment to Industry Benchmarks

Developed Plan That Addressed Needs & Outlined Investment

Described Plan's Benefits / Implications

Stakeholder Alignment

RESULT: A comprehensive, insight-led plan that received Board support and investment approval

MAY STRATEGY GROUP

The team executed a comprehensive current state assessment to uncover pain points and key priorities for the NCDR

The Approach

50+ Artifacts Reviewed

28 + Interviews

85 Staff Surveyed

70 + Research Hours

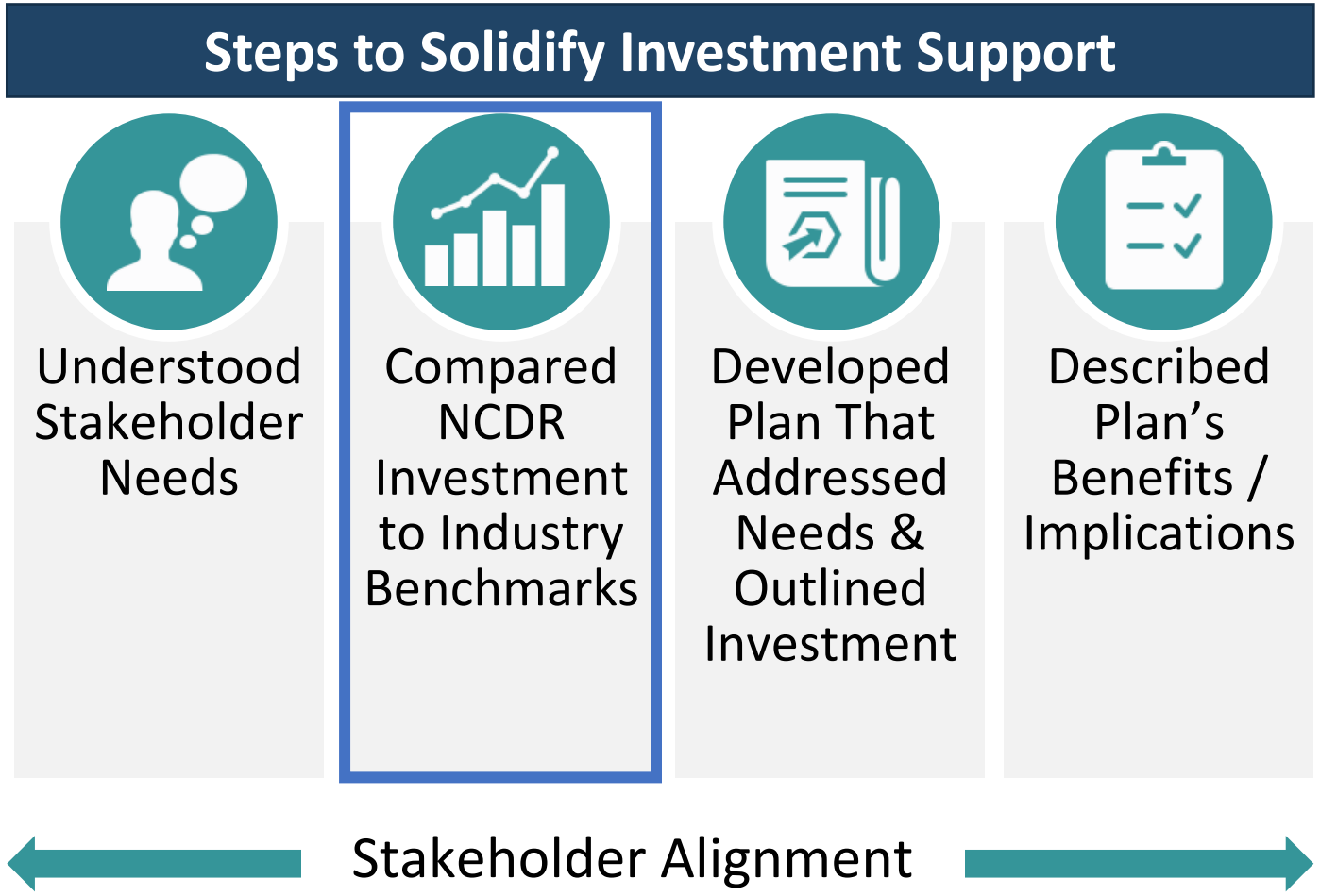
7 Workshops & 8+ Jam Sessions

- **NCDR Strengths**
- **Customer Pain Points & Needs**
- **Implications of Trends Impacting NCDR's Future**
- **Pressing Challenges for Staff**
- **Key Priorities to Address**

NCDR Stakeholders:

- Hospitals & Health Systems
- Providers
- Researchers
- Patients
- Payers
- Employer Groups
- ASCs
- Industry
- FDA
- State Agencies
- ACC Staff

HOW WE MADE THE CASE:



RESULT: A comprehensive, insight-led plan that received Board support and investment approval

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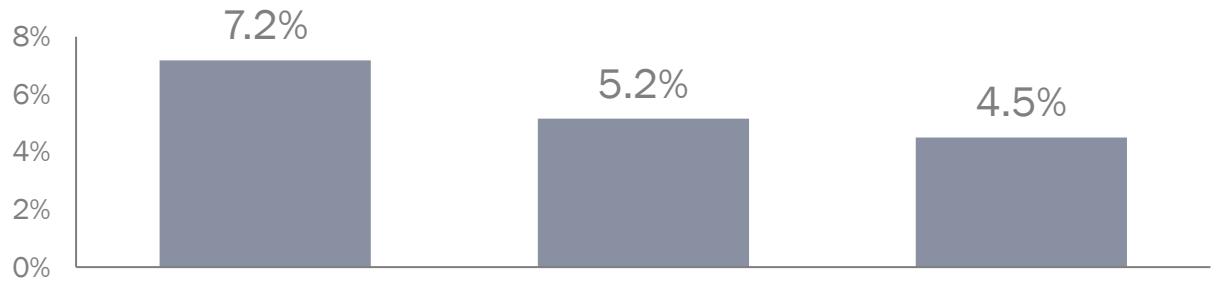
A comparison to other organizations in healthcare and technology identified an opportunity for additional investment into the NCDR

Reinvestment by Industry Sector
(Net Capital Expenditure / Sales)



Sample organizations in sector:

Microsoft, salesforce, slack, ORACLE

PREMIER, UNITEDHEALTH GROUP, Quest Diagnostics, McKESSON

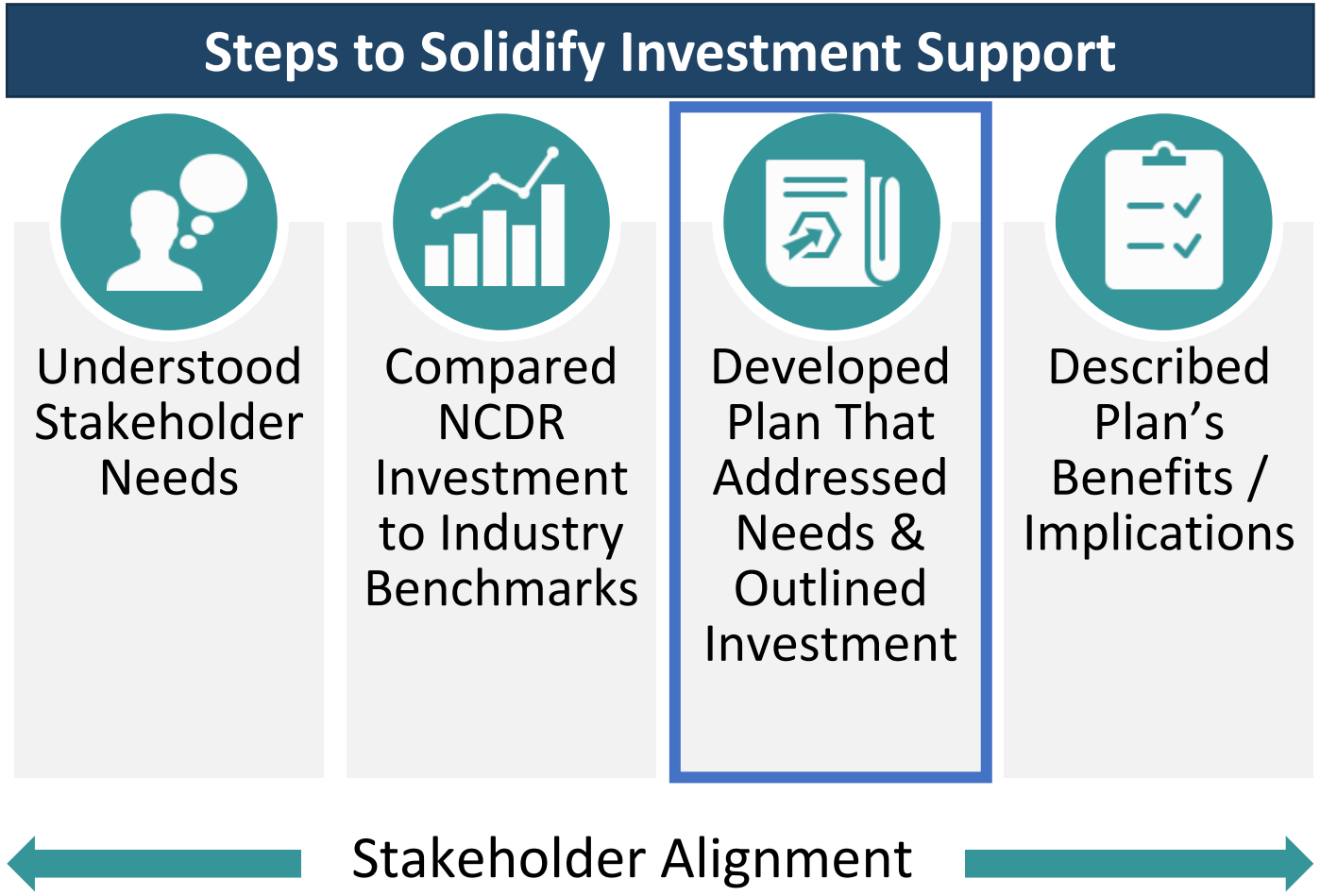
Cerner, Allscripts, inovalon, PRA Health Sciences, GoodRx

Benefits of the Analysis

- Grounded the discussion in facts
- Demonstrated NCDR was underinvesting relative to other healthcare and tech organizations
- Increasing investment would enhance ability to compete in the healthcare technology landscape

Sources & Notes
1.Reinvestment Benchmarks: NYU Stern School of Business Industry Analysis - Capital Expenditures by Sector (US), January 5, 2020 (LINK). Net capital expenditure is the sum of capital expenditures minus sum of depreciation
2. ACC Financial Data from Finance April, 2021. FTE numbers from December 2021 Presentation to BOT and 2021 Finance Committee Budget Book from 10.18.21 (Revenues and FTEs) and 2019 Finance Committee Budget Book from 10.2018

HOW WE MADE THE CASE:



RESULT: A comprehensive, insight-led plan that received Board support and investment approval

MAY STRATEGY GROUP

The optimization plan is robust and ensures the NCDR is well positioned for the future

The NCDR Optimization Plan

The team demonstrated: the plan was aligned to ACC's and NCDR's strategies, addressed key needs uncovered in research, and required additional investment

NCDR Optimization Plan

ACC Strategic Plan

NCDR Strategic Plan

	NCDR OPTIMIZATION PROGRAMS	REQUIREMENTS: 1. Real-Time, Meaningful Data	2. Modernize Reporting	3. Ease Data Burden	4. Enhance Nimbleness	5. Signal Where to Focus	6. Communicate/Prove Value	7. Improve Data Integration	8. Support Value-Based Care	$ (thousands)	% of ask
Reduce the Burden and Enhance the Scope of Data Collection	1.1. Program	✓	✓	✓	✓	✓		✓		$XX	28%
	1.2. Program	✓		✓				✓		In process	N/A
	1.3. Program	✓		✓	✓					$XX	16%
	1.4. Program							✓	✓	$XX	7%
Increase NCDR Value to Stakeholders	2.1. Program	✓	✓	✓	✓	✓	✓		✓	$XX	22%
	2.2. Program						✓		✓	$XX	5%
	2.3. Program			✓			✓		✓	$XX	8%
	2.4. Program						✓		✓	$XX	1%
	2.5. Program						✓		✓	$XX	1%
	2.6. Program						✓			$XX	1%
Promote Quality Improvement	3.1. Program					✓	✓			In process	N/A
Support Population Health Mgmt.	4.1. Program						✓		✓	$XX	2%
	4.2. Program	✓		✓	✓		✓			$XX	10%
									3-Year Incremental Investment :	*$XXXX*	

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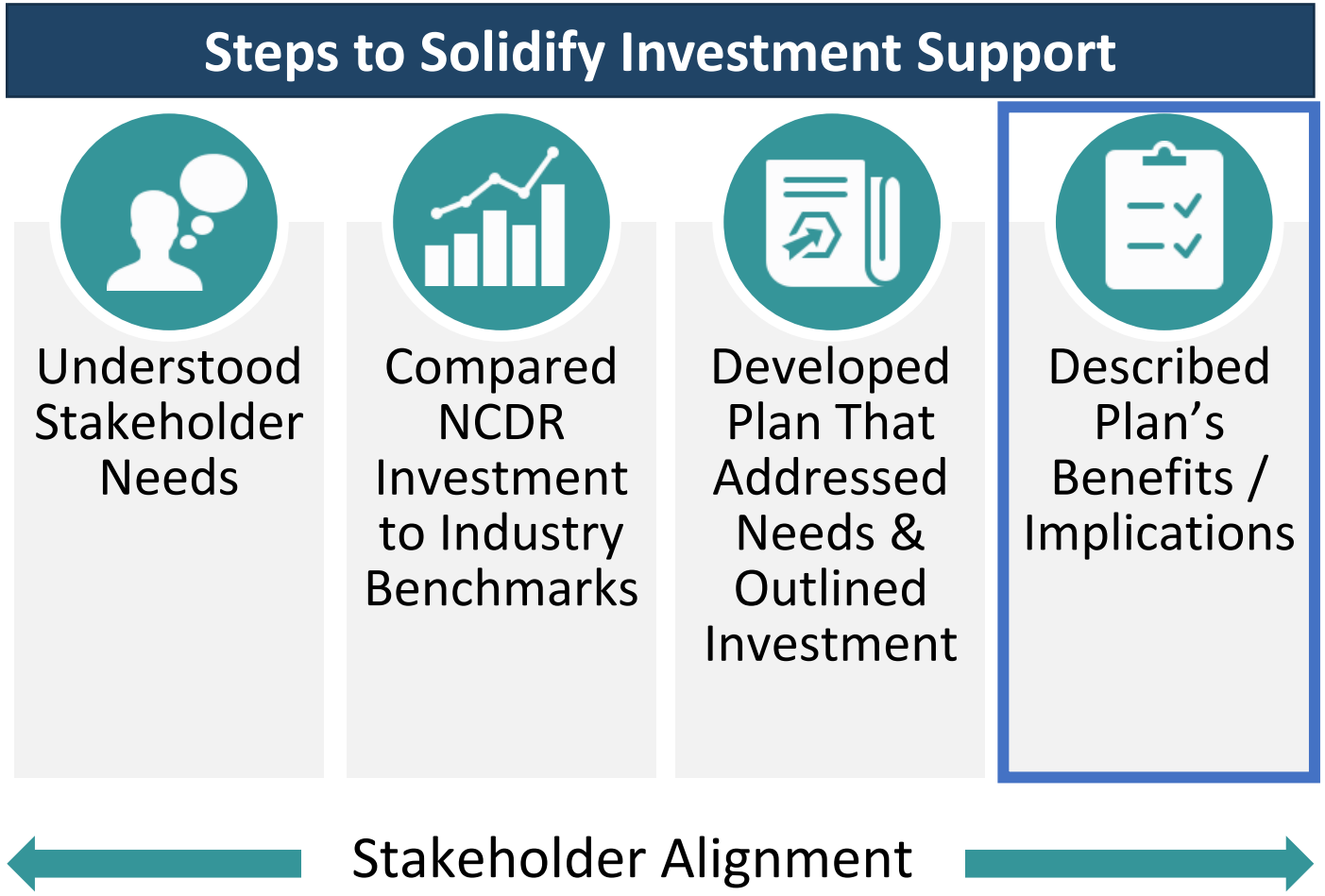
HOW WE MADE THE CASE:



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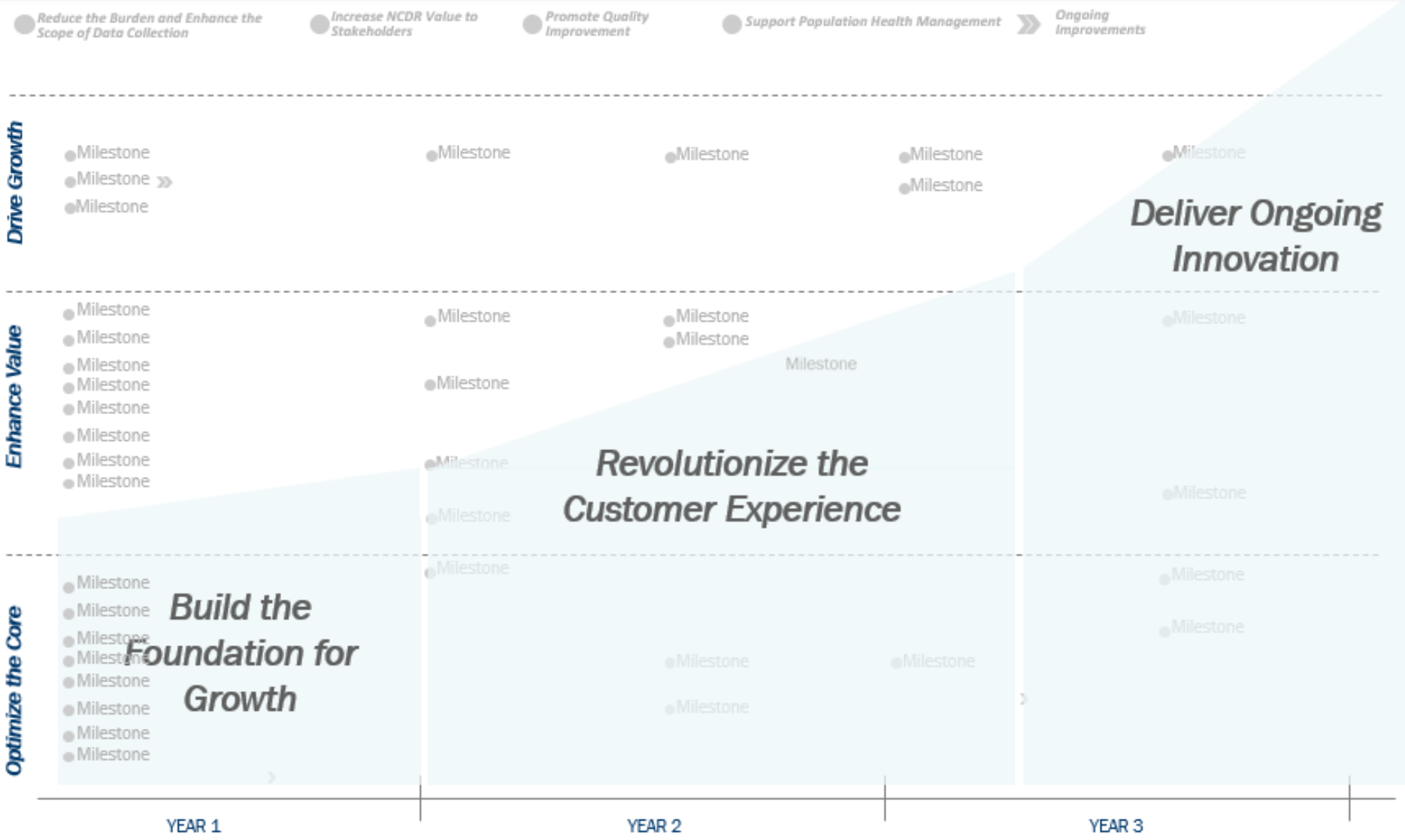
NCDR Optimization Roadmap – What Will be Realized

Utilizing prioritization results based on impact and level of effort, the team phased programs over three years



The NCDR of the Future is:

Vision: A world where NCDR advances patient care, outcomes, and value through knowledge and innovation.

MAY STRATEGY GROUP

For each stakeholder group, the team outlined tangible benefits and improvements to make benefits clear to the Board

Stakeholder Groups

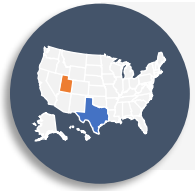
Hospitals & Health System Administrators

Patients

Providers & Researchers

Industry

Payers



Regions, States, Regulators

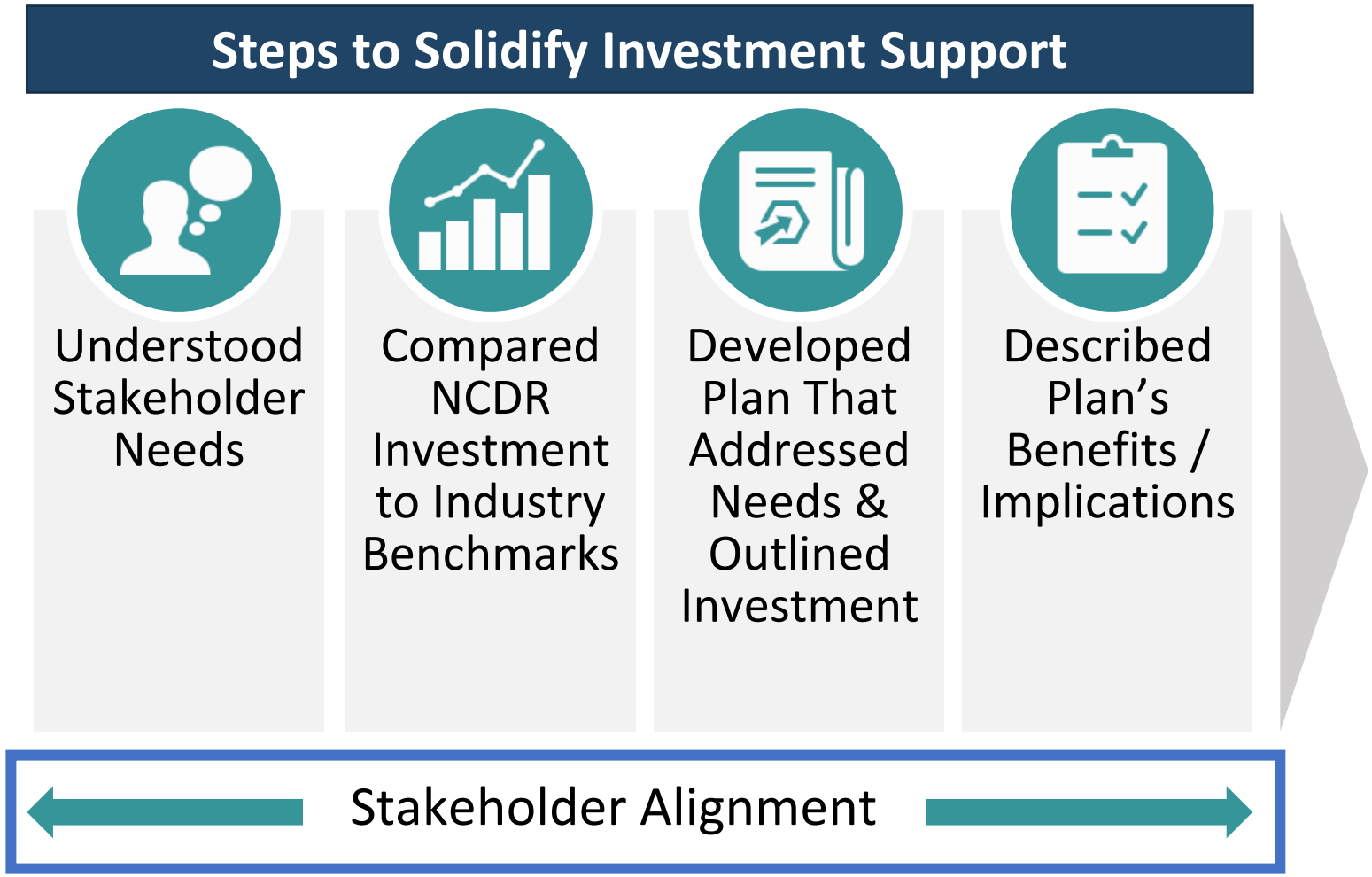
For each stakeholder group, the team outlined tangible benefits and improvements to make benefits clear to the Board

Example Benefits:

Providers & Researchers

- ✓ Improves the NCDR experience
- ✓ Increases access to data for research, QI, and ABMS credentialling
- ✓ Tightens integration of data into workflow
- ✓ Delivers more insights at the point of care

HOW WE MADE THE CASE:



RESULT: A comprehensive, insight-led plan that received Board support and investment approval

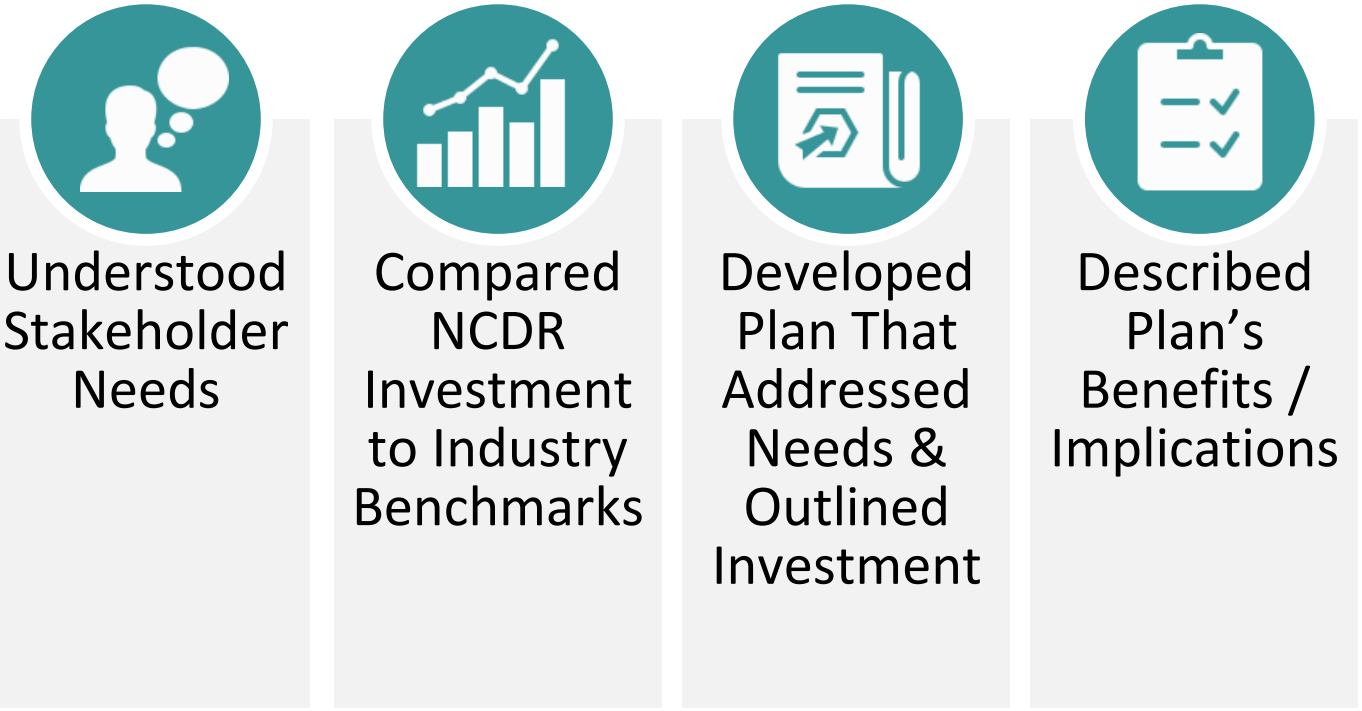
The team utilized several tactics to ensure plan alignment and buy-in

Stakeholder Alignment Best Practices

- ✓ Established Member Project Task Force (TF)
- ✓ Involved Staff Project TF with Executive and Business Line Staff
- ✓ Interviewed Key Stakeholders to Get Insights/Vision/Opinions
- ✓ Leveraged Members to Socialize Plan Prior to Final Presentation
- ✓ Utilized Pre-Read Materials and Shared Analysis & Approach
- ✓ Members Presented Plan Along with Staff & Addressed Q&A

HOW WE MADE THE CASE:

Steps to Solidify Investment Support



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Evaluating Options

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Business Intelligence Analytics
New Platform Selection: Power BI

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Agenda

- Why are we changing?
- Compare Options
- Tool Selection
- Next Steps
- Questions

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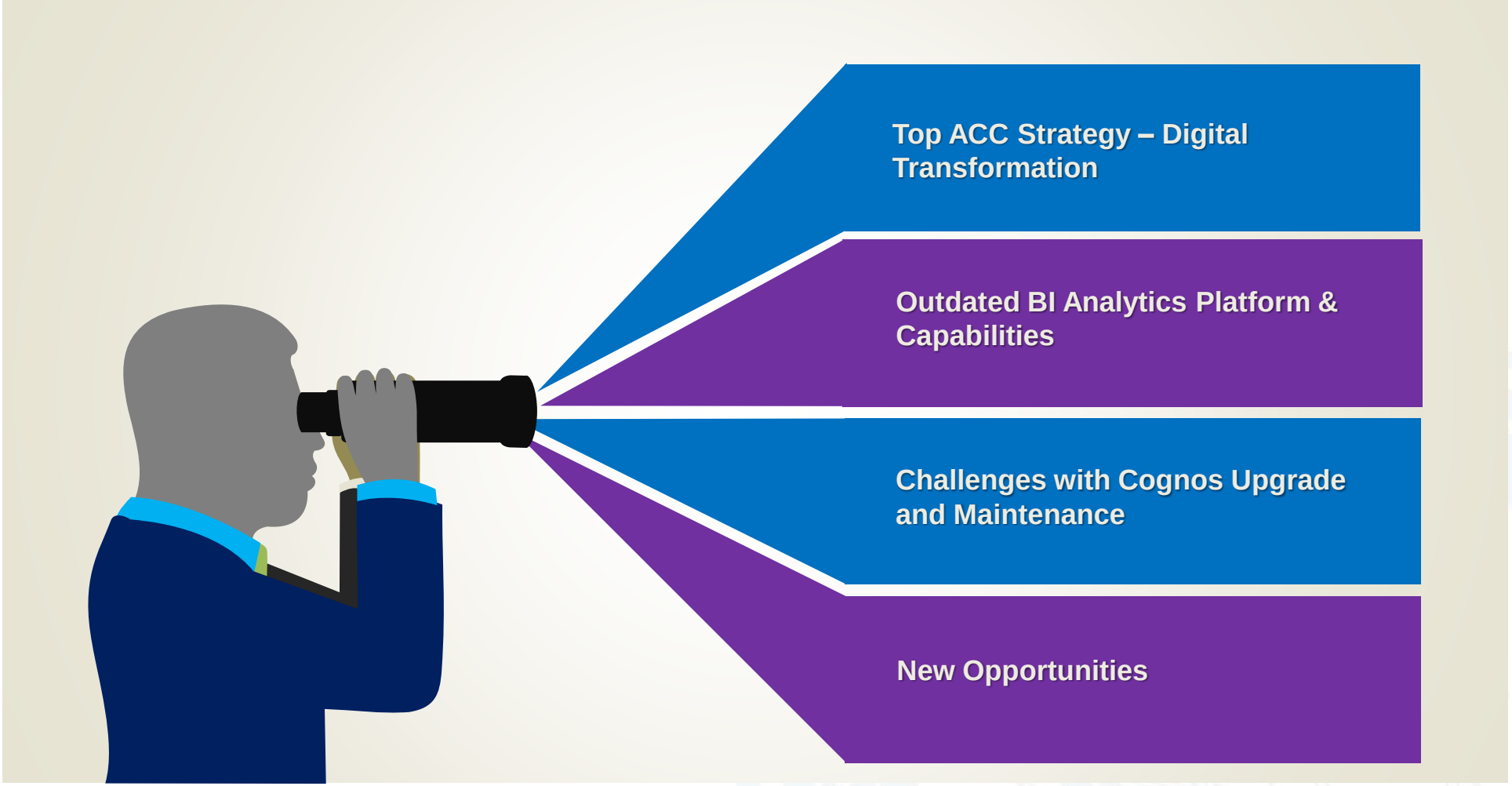
Why?



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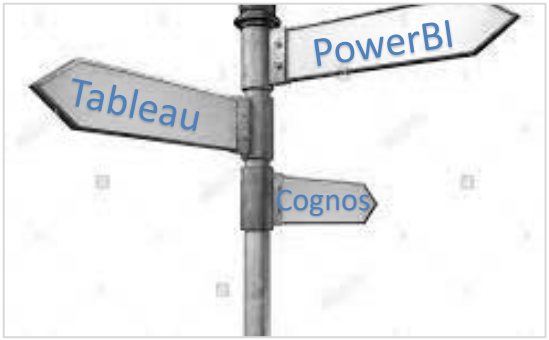
Our Approach

- Using industry research
  and the Digital Strategy recommendations,
  the team narrowed the field to 3 products.



- A deeper dive investigation was then performed
  on the short list of products that could meet the
  NCDR customer needs.

Gartner Report

Cognos:

- Many customers looking to modernize Analytics and business intelligence (ABI) usage are using the opportunity to reevaluate and assess other vendors

Power BI:

- Viewed as a visionary tool and leader in the platform as a service (Cloud)
- Power BI Pro cloud service leads most of its competitors in terms of functionality, e.g., moving from self-service to Augmented Analytics which utilizes AI & machine learning

Tableau:

- Considered the king of visual-based exploration experience
- Have broadened the scope of its product offerings, e.g., augmented analytics and governance capabilities

Citation: https://powerbi.microsoft.com/en-us/blog/microsoft-named-a-leader-in-the-2022-gartner-magic-quadrant-for-analytics-and-bi-platforms/

Figure 1: Magic Quadrant for Analytics and Business Intelligence Platforms

Source: Gartner (March 2022)

Deeper Dive Investigation

- Features
- Hosting & Security
- Single Sign On (SSO)
- Maintenance & Upgrades
- Costs
- Artificial Intelligence (AI)

Features

Cognos	PowerBI	Tableau
➢ Stable dashboard that has evolved over several years to meet current requirements featuring multiple lines of metrics with graphs ➢ Current custom solution meets the needs of the DAT team ➢ Slow, Non-Customizable, and limited visualization	➢ Rich visual exploration and interactive views ➢ Dashboards will require a redesign to utilize product features & design for optimal user experience ➢ PowerBI is fully integrated with office 365 ➢ PowerBI is highly customizable, responsive and can scale to meet business needs	➢ Rich visual exploration and interactive features ➢ Dashboards will require redesign to utilize the product features & design for optimal user experience ➢ Tableau has been purchased by Salesforce which may provide future integration benefits

Hosting & Security

Cognos	PowerBI	Tableau
➢ On-Prem - HIPAA Compliant	➢ On-Prem – N/A (cloud only)	➢ On-Prem - HIPAA Compliant
➢ Cloud - HIPAA Compliant	➢ Cloud – HIPAA Compliant	➢ Cloud - **Not HIPAA Compliant**

Single Sign On

Cognos	PowerBI	Tableau
➢ Current on-premise solution has complex SSO integration with Motiocap ➢ Cost & complexity for the cloud SSO solution TBD	➢ Simple SSO integration via .net user control	➢ Simple SSO integration via .net user control

Maintenance & Upgrade

Cognos (On Prem)	PowerBI	Tableau (On Prem)
➢ Significant level of effort due to upgrade complexity & lack of support ➢ Impacts our reputation and ability to serve our customers ➢ 4 years behind on upgrade	➢ Included with the cloud solution	➢ Level of effort unknown but may be like Cognos due to on prem hosting

Estimated Costs

Cognos	PowerBI	Tableau
➢ Approximately $90K for on-prem license renewal	➢ Cloud license cost estimated at $60 to $70K	➢ On-Prem license cost TBD (per Gartner report, estimated at double the cost of Cognos)
➢ Additional cost for servers, storage & maintenance ($30K)	➢ License cost includes hosting and maintenance	➢ Cloud license cost TBD
➢ Cloud license cost TBD	➢ Significant additional costs to rearchitect the existing Cognos reports	➢ Significant additional costs to rearchitect the existing Cognos reports
➢ Modification of existing reports TBD		

Artificial Intelligence (AI)

Cognos	PowerBI	Tableau
➢ AI capabilities are available as part of IBM Cloud Pak for Data (additional product purchase) ➢ Current version does not support this feature ➢ Current version has limited functionality in reporting solution	➢ Included with PowerBI desktop solution ➢ Microsoft Quick Insights is available to enable AI capabilities	➢ Tableau provides AI functionality via Ask Data/ Explain Data feature

Future Opportunities

- Analytics as a Service
- Predictive Analytics
- Cloud Hosting
- Rich Dashboard
- Self Service Analytics & Reporting

Note: Future opportunities will be considered based on the user need assessment

Tool Selection

Move to PowerBI Cloud Solution

Pros:

- Alleviate ACC IT staff from maintenance, upgrades, and support
- Rich set of features and capabilities are available and is rated as a top player in Gartner report
- With office 365 integration, it is a possible enterprise solution for reporting
- Cloud solution is HIPAA compliant
- Lower cost (excluding re-architecture costs for the dashboards)
- SSO integration is much simpler
- Easier to find qualified resources

Cons:

- Will require re-architecture for all existing NCDR dashboards
- Print and view features will function differently than the current dashboards

Next Steps

- Work with the hospital users and other stakeholders to redesign the dashboards - Completed
- Setting up ACC environments - In Progress
- Map out the redesign and migration timelines for all NCDR registries and dashboard solutions – In Progress

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Designing the Solution

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Reimagining the NCDR Experience

NCDR Optimization

Leveraging Design Thinking principles to redesign the NCDR Clinical Dashboards

Today's agenda

- About Slalom + ACC
- NCDR Design Journey
- NCDR Archetypes
- Wireframes

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About Slalom

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WHAT WE DO

Slalom is a purpose-led, global business and technology consulting company.

From strategy to implementation, our approach is fiercely human. We deeply understand our customers—and their customers—to deliver practical, end-to-end solutions that drive meaningful impact.

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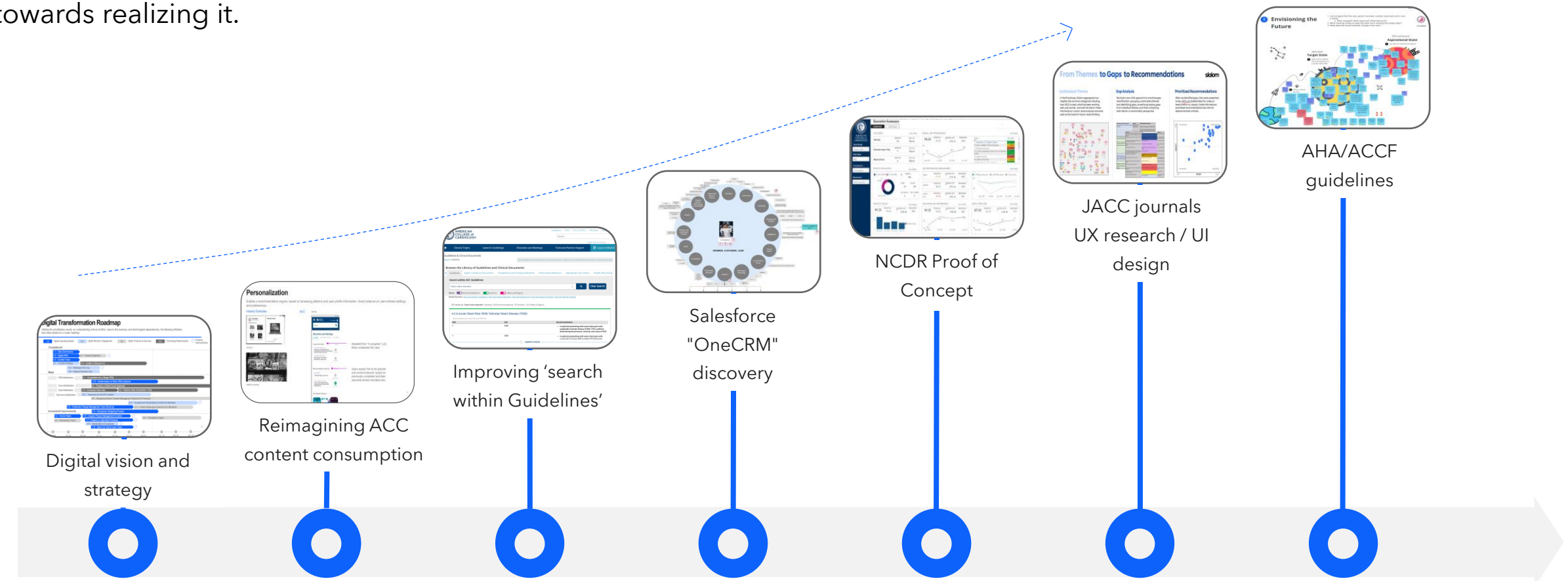
We've supported ACC on a digital journey

Over the past 3 years, we've helped advance ACC's mission to transform cardiovascular care and improve heart health.

Starting in 2019, we worked with ACCF's leadership to understand the digital vision for NCDR and taken the first steps towards realizing it.



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NCDR Design Journey

Our Challenge

ACC's flagship product, the National Cardiovascular Data Registry (NCDR), was **in need of modernization** due to **changes in customer expectations** and the **maturing of available technologies.**

ACC engaged with Slalom to provide expertise in **user experience design, data architecture, and data visualization.**

Current State Review

Define Future State

Develop POC

Conduct Research & Interviews

Assess Technical Architecture

Align on NCDR POC Vision

Synthesize User Research

Define Voice of the Customer

Develop Wireframes / User Flows

Develop Power BI POC

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We Asked a Lot of Questions. A Lot.

We conducted 30+ interviews, deep dives, demos, and walkthroughs to better understand the wholistic NCDR experience

Facility / System Directors

Leaders of Hospital facilities / system of hospitals interested in their collective performance against benchmarks

Quality Program Coordinators

Employees leveraging NCDR for Quality Improvement initiatives within facilities / hospital systems

Physicians

The physicians performing cardio procedures being benchmarked within NCDR

Data Abstractors

Employees responsible for inputting data into NCDR

Researchers / Analysts

Users leveraging NCDR data (and other sources) for research / analytical purposes

Internal ACC Stakeholders

The ACC team members responsible for managing the NCDR platform (business / technology

Topics

- User Experience
- Pain Points
- Wish List Items
- Current Technology / Data Landscape
- Walkthroughs / Demos of NCDR Usage
- “Day in the Life” Examples

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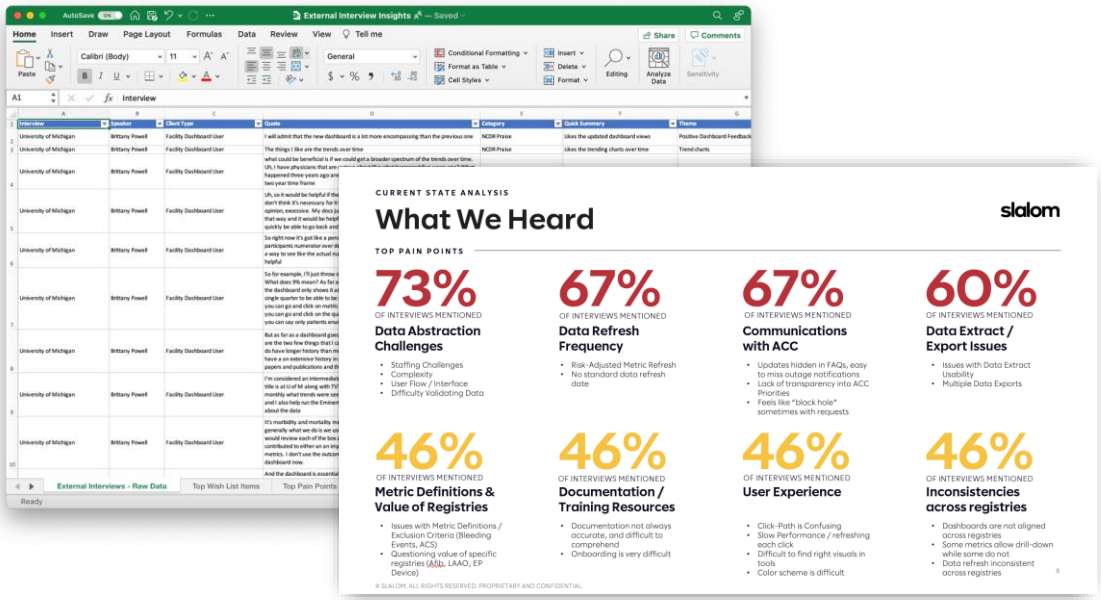
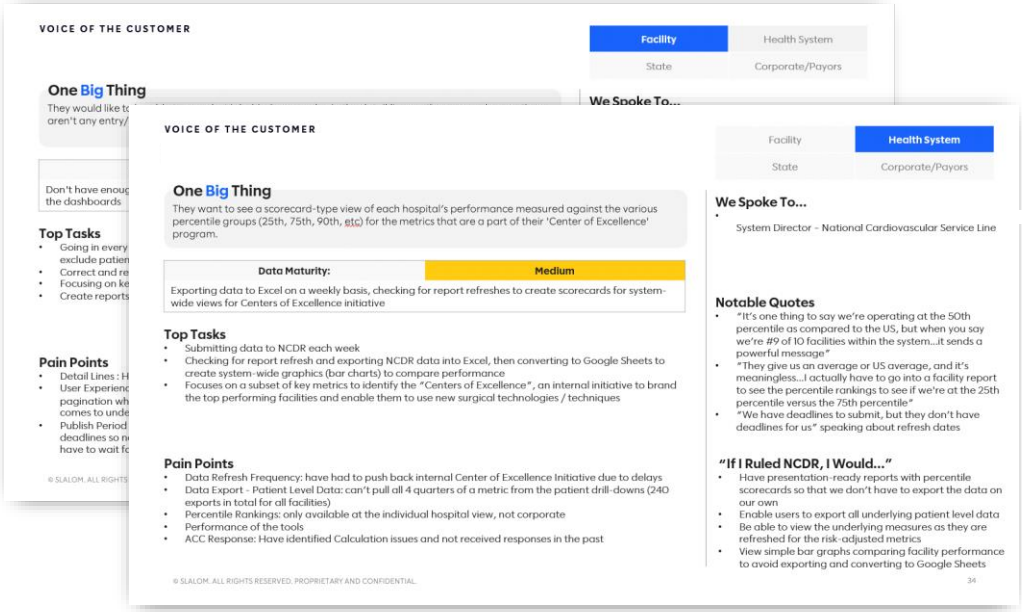
We heard feedback, and compiled key quantitative and qualitative insights

Users provided honest insights about the NCDR reporting capabilities, as well as topics well-beyond our scope, to provide ACC with a wealth of information about the full NCDR experience, from procedures to abstraction to insight





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...and used that to map the NCDR customer experience.

Data Preparation

Reporting

Abstract

Collecting organizationally defined, clinically relevant data elements from a repository of documents describing each patient's medical record and entering them into the registry

Review

Conduct internal Quality Assurance (e.g. Peer Review) to ensure data is accurate avoiding any human error that may have been introduced in the abstraction process

Submit

Submit data into NCDR on a quarterly and ad-hoc basis using multiple options for submission

Analyze

Review, benchmark, filter, drill into and analyze registry information across systems, facilities, and operators to derive insights. Review patient-level details to identify any patients who "fell out" of a metric or were excluded

Export

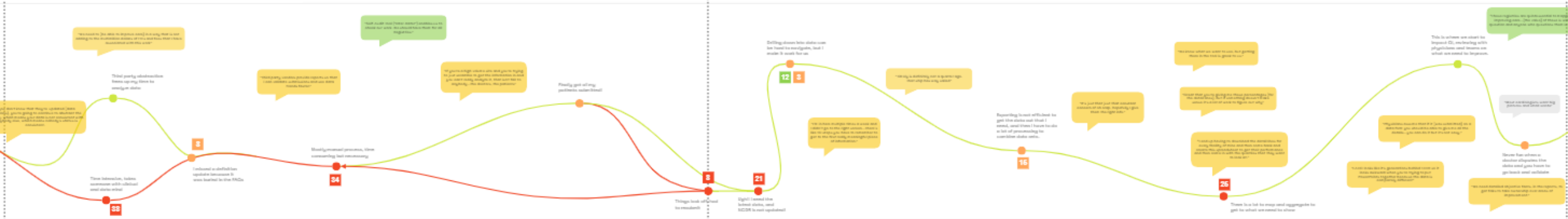
Export data, visualizations, or reports from NCDR to enable reporting and communications with QI/PI stakeholders

Aggregate*

Use tools and data sets outside of NCDR to derive additional insights or develop additional analysis unique to system/facility.

Report

Use analytic outputs and reports to communicate previously hidden patterns in data, deviations from ideal care, and performance differences across units or organizations to drive the right QI/PI measures.



EHR | NCDR Portal | NCDR Dashboard | 3rd-Party Abstraction Tool/Vendor

NCDR Dashboard | Self-Audit Tool | Internal QA Tools

NCDR Dashboard | 3rd-Party Abstraction Tool/Vendor

NCDR Dashboard

NCDR Dashboard | NCDR Portal

Excel | Tableau | PowerBI | 3rd-Party Vendor

NCDR Dashboard | Excel | Tableau | PPT | PDF | Email | Meeting | PowerBI | 3rd-Party Vendor

Support from ACC as needed

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We further synthesized our findings into 3 distinct User Archetypes

We realized quickly that ethnography and demography played a minor role - users' needs were very similar, albeit a little nuanced based on the span and maturity of their Quality Improvement programs and their roles interacting with NCDR

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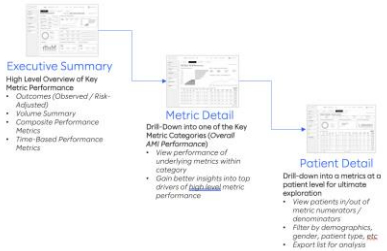
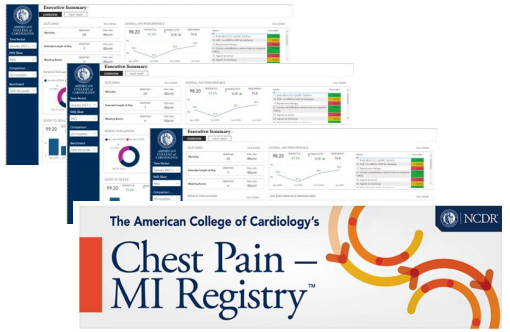
To guide our wireframe designs (iteratively)

We went through numerous iterations to make sure that we were building the right design, keeping what we heard in mind





User Flows

Analyze metrics and create relationships/ hierarchy between data

Wireframes

Test ideas, concepts, information architecture, layout, and initial usability

Power BI Dev.

Quickly test wireframe concepts and working with data to see if it can support the desired experience

Final POCs

Refined PowerBI POCs for Facility, Corporate, and Physician Dashboards showing one use case per each within a limited number of metrics for Chest Pain.

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Outcomes & Reactions

We followed up with NCDR users to ensure our designs met their needs

"This would help us spend less time manually working with data and more time focusing on the patient and what we really could improve"

- Facility Client

"If ACC continues to move this along they'll put a lot of third party vendors out of business. This would save us a couple million dollars a year."

- Health Systems Client

"There is a huge focus across the nation in disparity of care, having a view like this would be a really great opportunity to be able to see that."

- Facility Client

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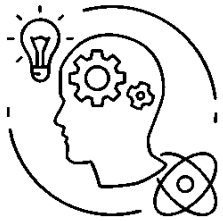
What's Next

ACC is currently working to scale the Proof-of-Concepts to production across its suite of registries

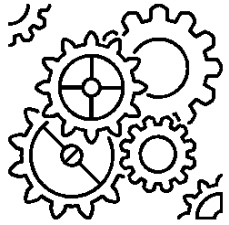


POC

Confirms art of the possible, technical feasibility, go/no go, informs product roadmap

MVP

Pilot initial Dashboard(s) with customers, gather feedback and refine



Full Production

All registries making effective use of PowerBI and all customers successfully transitioned

Continuous Innovation

Modern Data/Tech Stack & operating models enables nimble delivery of enhanced and new capabilities

Following the user-centric design approach is helping ACC deliver an impactful solution to end users, faster

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Questions