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.
Project Overview & Making the Case

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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:

- Efficient
- Interactive
- Anticipatory
- Integrated for Value
To achieve this vision, it is critical to understand and navigate threats

Example Threats to the NCDR

- Tech Companies
- EHR Companies
- Changing Customer Expectations
- Hospitals & Industry Building Own Solutions
- Dependent on New Med. Devices, Procedures
- CMS & FDA Decisions
- Policy Changes
The NCDR kicked off an optimization project to ensure the registry was positioned for the future.

### NCDR Optimization Project Rationale

1. **NCDR IMPORTANCE**: NCDR is critically important to the Success and Mission of the ACC.


3. **SECURE SUPPORT**: Ability to Secure Funding & Alignment Around Critical Priorities.

**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

Understood Stakeholder Needs
Compared NCDR Investment to Industry Benchmarks
Developed Plan That Addressed Needs & Outlined Investment
Described Plan’s Benefits / Implications

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

<table>
<thead>
<tr>
<th>Steps to Solidify Investment Support</th>
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<tr>
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<tr>
<td><strong>Described Plan’s Benefits / Implications</strong></td>
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**RESULT:** A comprehensive, insight-led plan that received Board support and investment approval.
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)

- Software (System & Application): 7.2%
- Healthcare Support Services: 5.2%
- Healthcare Info & Tech: 4.5%

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

Sample organizations in sector:

Microsoft, Salesforce, Slack, Oracle, Premier, UnitedHealth Group, Cerner, Allscripts, Inovalon, PRA Health Sciences, McKesson, GoodRx

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:

**Steps to Solidify Investment Support**

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**RESULT:** A comprehensive, insight-led plan that received Board support and investment approval.
The optimization plan is robust and ensures the NCDR is well positioned for the future.

The NCDR Optimization Plan

- 13 Unique, Strategically-Aligned Programs
- 79 Projects Spanning 3 Years
- Focus on: Optimizing the Core, Enhancing Value, & Driving Growth
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**
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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.

1. Build the Foundation for Growth
2. Drive Growth
3. Enhance Value
4. Revolutionize the Customer Experience
5. Deliver Ongoing Innovation

The NCDR of the Future is..

Vision: A world where NCDR advances patient care, outcomes, and value through knowledge and innovation.
For each stakeholder group, the team outlined tangible benefits and improvements to make benefits clear to the Board.

Stakeholder Groups

- Hospitals & Health System Administrators
- Providers & Researchers
- Payers
- Patients
- Industry
- Regions, States, Regulators
For each stakeholder group, the team outlined tangible benefits and improvements to make benefits clear to the Board

Example Benefits:

- 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:

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Stakeholder Alignment
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
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Evaluating Options

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Program 2.1 Modernize Reporting & NCDR User Experience

Business Intelligence Analytics
New Platform Selection: Power BI
Agenda

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

Top ACC Strategy – Digital Transformation

Outdated BI Analytics Platform & Capabilities

Challenges with Cognos Upgrade and Maintenance

New Opportunities
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.

Deeper Dive Investigation

Features
Hosting & Security
Single Sign On (SSO)

Maintenance & Upgrades
Costs
Artificial Intelligence (AI)
## Features

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

<table>
<thead>
<tr>
<th></th>
<th>Cognos</th>
<th>PowerBI</th>
<th>Tableau</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Prem</td>
<td>On-Prem - HIPAA Compliant</td>
<td>On-Prem – N/A (cloud only)</td>
<td>On-Prem - HIPAA Compliant</td>
</tr>
<tr>
<td>Cloud</td>
<td>Cloud - HIPAA Compliant</td>
<td>Cloud – HIPAA Compliant</td>
<td>Cloud - Not HIPAA Compliant</td>
</tr>
</tbody>
</table>

HIPAA Compliant: Yes
Not HIPAA Compliant: No
**Single Sign On**

<table>
<thead>
<tr>
<th>Cognos</th>
<th>PowerBI</th>
<th>Tableau</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Current on-premise solution has complex SSO integration with Motiocap</td>
<td>➢ Simple SSO integration via .net user control</td>
<td>➢ Simple SSO integration via .net user control</td>
</tr>
<tr>
<td>➢ Cost &amp; complexity for the cloud SSO solution TBD</td>
<td></td>
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</tr>
</tbody>
</table>
# Maintenance & Upgrade

<table>
<thead>
<tr>
<th>Cognos (On Prem)</th>
<th>PowerBI</th>
<th>Tableau (On Prem)</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Significant level of effort due to upgrade complexity &amp; lack of support</td>
<td>➢ Included with the cloud solution</td>
<td>➢ Level of effort unknown but may be like Cognos due to on prem hosting</td>
</tr>
<tr>
<td>➢ Impacts our reputation and ability to serve our customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>➢ 4 years behind on upgrade</td>
<td></td>
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</tbody>
</table>
## Estimated Costs

<table>
<thead>
<tr>
<th>Cognos</th>
<th>PowerBI</th>
<th>Tableau</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Approximately $90K for on-prem license renewal</td>
<td>➢ Cloud license cost estimated at $60 to $70K</td>
<td>➢ On-Prem license cost TBD (per Gartner report, estimated at double the cost of Cognos)</td>
</tr>
<tr>
<td>➢ Additional cost for servers, storage &amp; maintenance ($30K)</td>
<td>➢ License cost includes hosting and maintenance</td>
<td>➢ Cloud license cost TBD</td>
</tr>
<tr>
<td>➢ Cloud license cost TBD</td>
<td>➢ Significant additional costs to rearchitect the existing Cognos reports</td>
<td>➢ Significant additional costs to rearchitect the existing Cognos reports</td>
</tr>
<tr>
<td>➢ Modification of existing reports TBD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognos</td>
<td>PowerBI</td>
<td>Tableau</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>➢ AI capabilities are available as part of IBM Cloud Pak for Data</td>
<td>➢ Included with PowerBI desktop solution</td>
<td>➢ Tableau provides AI functionality via Ask Data/Explain Data feature</td>
</tr>
<tr>
<td>(additional product purchase)</td>
<td>➢ Microsoft Quick Insights is available to enable AI capabilities</td>
<td></td>
</tr>
<tr>
<td>➢ Current version does not support this feature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>➢ Current version has limited functionality in reporting solution</td>
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</tbody>
</table>
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
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
Slalом 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.
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.
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.
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
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.
...and used that to map the NCDR customer experience.
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.
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.
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
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.
Questions