AGENDA

- Setting the stage
- What is Analytics and why is it important?
- History of analytics in healthcare
- Current state of the market
- Use Cases
- Key success factors around analytics
- Pragmatic approaches to launching analytics initiatives
Orchestrating Change

Maestro Strategies combines strategic and operational insight with deep understanding of advanced information technologies and analytic tools to help our healthcare clients execute strategic priorities and accelerate value creation.
Founded in 1989, we are solely dedicated to the healthcare industry. We help clients solve complex problems by viewing key questions through multiple lenses:

- **What to change?** – the strategic view
- **How to change?** – the care delivery model, process, informational and operational view
- **At what cost?** – the information technology, organization design and resource view
- **For what return on investment?** – the qualitative and quantitative outcome view
INTRODUCTIONS – SUSAN IRBY

- Over 30 years serving healthcare in the provider arena as well as consultant to the industry
- Business Intelligence Practice Leader for Maestro, working with clients to develop and execute strategies around strategic decision making and Business Intelligence
- Industry pioneer in Decision Support at Alta Bates (Sutter Health)
- Contributor to HIT Return on Investment series and developer of Maestro’s ROI Toolkit©
- Frequent speaker on the topic of Business Intelligence, Analytics and Information Driven Decision Making
- Former adjunct faculty member at UAB Healthcare IT, lecturing in Decision Support

Susan Irby
Business Intelligence Practice Leader
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WHERE ARE WE NOW?

2010

Fee for service reimbursement
Hospital Consolidation
Practice Acquisition

2015

Clinical Integration
Patient Engagement
Cross Venue Process Redesign
Performance Measurement
Early Stage Population Stratification

2020

Risk Management
Population Health Management
Retail Care
Social, Mobile, Cloud based Care
Consumer Behavior Management

Systems of Record

Systems of Insight

Systems of Innovation

Compliance
Enterprise/Market Strategy

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VALUE BASED REIMBURSEMENT & CARE MODEL

Financial Opportunity & Incentive Alignment

Value Based Delivery Spectrum

P4P  PCMH  Clinical Integration  Shared Savings  Bundled Payments  Shared Risks  Capitation Full Risks

Provider Sponsored Health Plans
Self Insured Employer Programs
Commercial Health Plans
Governmental Reimbursement

Care Management Model

Integrated, standardized workflow management and monitoring
Seamless Patient Experience Across the Continuum

Wellness/Preventive Care  Primary Care/PCMH  Specialty Care  Urgent/Emergent Services  Acute Hospital Care  Care Transitions  Post-Acute Care/Home Care  End-of-Life Care

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“As the future unfolds…more business decisions will be supported by the facts that only analytics can provide; and fewer business decisions will be made on the basis of instinct and guess work”

Source: Back Cover of Competing on Analytics
WHY ARE ANALYTICS IMPORTANT TO HEALTHCARE?

Volume Based First Curve

- EHR Go-Live & Stabilization
- Meaningful Use Attestation
- EHR Go-Live & Stabilization
- Optimization Focus On EHR & Associated Workflows
- eMeasures within Key Silos of Care
- Operationalization of EHR within Key Silos of Care

Value Based Second Curve

- Predictive & Prescriptive Modeling
- Real time, point of care CDS
- Accountable cost & risk management
- Stratified Patient Engagement & Care Protocols
- Measurement and Management of Care Transitions
- Value Driven Cross Continuum Process Reengineering
- Integrated Data Warehouse
- Cross Continuum Interoperability
- Vertical Process & HIT Integration
- Health Informatics & Analytics Leadership Development
- IT Asset Rationalization & Consolidation

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If the data gathering workload was reduced from weeks to minutes, what actions would organizations be enabled to take?
Analytics and Business Intelligence (BI) refer to the strategies, skills, processes, technologies, applications and practices used to support decision making. Consists of:

- A disciplined process system that collects, integrates, analyses and presents business information to support better business decision making
- An ecosystem where decision makers receive information that is reliable, secure, consistent, understandable, easily manipulated and timely...facilitating more informed decision making

However, the “Right” information can answer different types of questions...
WHAT ANALYTICS ISN’T

- Data Collection Application (Data communication)
- Transactional System (Data automation)
- Data Warehouse/Data Mart (Data aggregation)
- Spreadsheet (Data compilation/presentation)
- Cost Accounting (Data allocation)
Florence Nightingale

Born: May 12, 1820  Died: August 13, 1910

History: Nightingale served as a nurse during the Crimean War, tending to wounded soldiers. She was called "The Lady with the Lamp" because of her habit of making rounds at night.

Florence Nightingale - “Founder of Modern Nursing”

She laid the foundation of professional nursing with the establishment of her nursing school at St Thomas’ Hospital in London. It was the first secular nursing school in the world and is now part of King’s College London. The Nightingale Pledge, taken by new nurses, was named in Florence Nightingale’s honor.

Nurses Day is celebrated around the world on Florence Nightingale’s birthday.
MAJORITY OF DEATHS DUE TO DISEASE, NOT BATTLEFIELD WOUNDS

- First Woman Fellow of the Royal Statistical Society (1859)
- Honorary member of the American Statistical Association (1874)
- Karl Pearson, a famous statistician and the founder of the world’s first university statistics department, acknowledged Nightingale as a “prophetess” in the development of applied statistics

DEFINITIONS OF ANALYTICS AND BUSINESS INTELLIGENCE

1990’s – 2000’s: “translating data into information to drive decisions”

Today - High Value Health Care: “A healthcare system’s capability to think, analyze, plan, reason, learn, solve problems and creatively transform to accountable care”
USE OF BI/ANALYTICS TOOLS IN HEALTHCARE TODAY

- Use EDW: 13%
- Improve Operation Efficiencies: 13%
- Support Translational Research & Clinical Effectiveness: 8%
- Use Standalone Point to Point Systems: 20%
- Plan in place for EDW: 17%
- No use of analytics, but plan in process: 20%
- No clear analytics strategy: 9%

Source: Healthcare IT News BI/Analytics Survey 2012
Hype Cycle for Healthcare Provider Applications, Analytics and Systems, 2014

Gartner
WHERE ARE WE TODAY – THE TYPICAL HEALTH SYSTEM

Thousands of Hours of Manual Labor

Departmental Analytics Initiatives


Source: Health Care DataWorks

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WHERE ARE WE TODAY – COMPLEX SETTINGS

- Existing EDW – “Build it they will come”
- AMC, build research cohorts from patient care data
- Significant investments in resources, tools, data models, etc.
- Gaps in data stewardship, use of reports, self serve & alignment with strategy
STATE OF THE MARKET – TRADITIONAL DECISION SUPPORT

Percent of Hospitals Automated

- Financial Data Warehousing/Mining: 56%
- Budgeting: 85%
- Cost Accounting: 69%
- Contract Management: 69%
- Financial Modeling: 44%
- Clinical Data Warehousing/Mining: 48%
- Outcomes/Quality Mgt: 75%
- Physician Assessment Tool: 16%
- Exec Info Sys: 65%

Source: HIMSS Analytics Database 10/14/14
STATE OF THE MARKET – BUSINESS INTELLIGENCE

Financial BI

- Not Automated 43%
- All Others 21%
- SAP 3%
- Infor 3%
- Self-Developed 5%
- Allscripts 3%
- Meditech 5%
- Business Objects 9%
- McKesson 8%

Clinical BI

- Not Automated 64%
- All Others 17%
- Self-Developed 3%
- Cerner 7%
- McKesson 3%
- Epic 6%
- All Others 3%
- Not Automated 64%

• 64 Different Vendors Live
  Source: HIMSS Analytics Database 10/14/14

• 44 Different Vendors Live

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**Degree of Importance to the HCO**

Degree of Difficulty

1. **Descriptive**
   - What happened?
     - Analyze a past capacity bottleneck
     - Average daily census
     - And case mix

2. **Predictive**
   - What might happen?
     - Help predict capacity bottlenecks
     - Identify high risk patients

3. **Prescriptive**
   - What should we do?
     - Identify how to optimize capacity
     - Choose the best therapeutic approach for a particular patient
     - How do we cut costs most effectively?

**TODAY**

**GOAL**

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**DIFFERENT CAPABILITIES FOR DIFFERENT TYPES OF QUESTIONS**

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INFORMATION DRIVEN DECISION MAKING

Enterprise Performance Improvement

Population Health Management
USE CASE – DESCRIPTIVE ANALYTICS

Portfolio Management

- Examine Cross-Venue Volumes, Revenues and Expenses
- Determine Contribution Margins by Service Line and/or Sub-Service
- Identify Services to Grow, Shrink, or Eliminate
USE CASE – PREDICTIVE ANALYTICS

Readmission Risk

- Combine Clinical Data from EHR with Social Data
- Assign Risk Score
- Communicate to Case Management
- Communicate with PCP
Cardiac Event Prevention

- Combine Cardiac Registry, PHR and Weather Forecast
- Text at Risk Patients to Avoid Activity
# ANALYTICS USE CASES

<table>
<thead>
<tr>
<th>Enterprise Performance Management</th>
<th>Population Health Management</th>
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<tbody>
<tr>
<td><strong>Descriptive</strong></td>
<td><strong>Disease Dashboards</strong></td>
</tr>
<tr>
<td>• Service Line Performance</td>
<td>• Bundled Payment Scorecard</td>
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<td>• Practice Variation</td>
<td>• Screening Rates</td>
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<td>• Patient Satisfaction</td>
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<tr>
<td><strong>Predictive</strong></td>
<td><strong>Demand Estimation</strong></td>
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<tr>
<td>• Demand Estimation</td>
<td>• Population Risk</td>
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<td>• Readmission Risk</td>
<td>• Complications Risk</td>
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<td>• Contract Modeling</td>
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<tr>
<td><strong>Prescriptive</strong></td>
<td><strong>Patient Engagement</strong></td>
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<tr>
<td>• Service Utilization Optimization</td>
<td>• Protocols</td>
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<td>• Resource Scheduling</td>
<td>• Outreach Programming</td>
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<tr>
<td>• Care Pathway Optimization</td>
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</table>
DISCUSSION: WHAT USE CASES DO YOU SEE IN YOUR ORGANIZATION?
HIGH DEMAND FOR 2.0 DELIVERABLES

“Need it now”

Business Intelligence/Analytics 1.0

- Data derived from manual manipulation of data sources or single transaction system
- Retrospective analysis of unit or department systems
- Ask simple questions – “How many patients have Diagnosis X and experience Outcome Y?”
- Manual reports and dashboard, niche analytics applications
- Multiple solutions required – “Build once, use once”

“Emerging Solutions”

Business Intelligence/Analytics 2.0

- Data derived from multiple transactional source systems
- Focused on enterprise-level prospective and predictive analyses
- Ask hard questions – “Show me the impact of X on quality measures and patient satisfaction metrics”
- Enterprise health analytic platforms
- Single enterprise solutions – “Build once, use many times”

Source: HIT News
BI/ANALYTICS 3.0 BECOMES PART OF THE CARE MANAGEMENT PLATFORM

Consumer & Patient Engagement
24/7 Access via Unified Portal, Self Service Scheduling, Branded Call Centers, Customer Relationship Management, Patient Self Reported Data, Linguistic Services, Remote Monitoring, Patient Education, Telehealth/mHealth & Telemedicine, etc.

Advanced Care Management
Health Risk Assessment, Care Management, Case Management, Care Planning, Adherence Alerts, Disease Management, Risk Management, Referral Management, Rules Based Workflows, etc.

Knowledge Management & Analytics
Data Governance, Business Intelligence, Care Protocols, Claims Data, Point of Care Clinical Decision Support, Metrics, Data Mining, Predictive Modeling, etc.

Health Information Exchange
Master Patient Index, Secure Messaging, Standards based Interoperability, Communication Tools, Referral Tracking, Community Health Record, Registries, etc.

Foundational Systems
“There is a virtuous cycle created by having the foundational IT systems in place, applying health informatics skills to help make the systems ‘smart’, building analytics capabilities to inform decision making and partnering with quality to drive performance improvement and transformed care processes.”

Source: Maestro/UHC Research:

John Fox, President and CEO of Beaumont Health/previous CEO Emory Health
**Enterprise Vision & Strategic Direction:** Ensuring that the enterprise’s BI and Analytics strategy and plan aligns with the organization’s strategic goals.

**Decision Making Culture & Readiness:** Identifying where the enterprise is in moving towards data-driven decision making and the cultural changes that may be required.

**Data Governance, Stewardship and Definitions:** Ensuring that data models and data dictionaries are defined, and that there is a process in place to determine “source of truth” as well as data change management.

**Leadership, Organization & Skill Sets:** Identifying executive champions and sponsors, skill sets needed across the organization and the appropriate organization to support BI and Analytics.

**Architecture, Technology & Tools:** Specifying the architecture to integrate source system data, and the tools to support data curation, analytic function and data visualization.
Emerging Practice

- High performing organizations have organizational initiatives supported by underlying analytics components that:
  - Support the validity of the initiative
  - Allow measurement of success in executing the initiative
- Analytics are a key component of the organizational strategy and are used as a competitive advantage around:
  - Organization growth
  - Value based purchasing
  - Outcomes measurement (clinical and financial)
- Enterprise views data as a strategic asset
- Health Analytics are imbedded across the organization
"Transforming from siloed hierarchical decision making model is described as running a marathon while having a heart-lung transplant. Vertical process and infrastructure silos must evolve to collaborative decision making structures while maintaining day-to-day operations."

Source: The Agile Enterprise, 2005

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**CYNEFIN DECISION MAKING FRAMEWORK**

- **Disorder** – this is where organizations find themselves when it is unclear which of the other four context a decision falls in.
- **Simple** – characterized by sensing, categorizing and responding.
- **Complicated** – characterized by sensing, analyzing and responding.
- **Complex** – involves probing first, then sense/learn, then responding Use of Business Intelligence (Health Analytics) and data is very well suited for this domain
- **Chaotic** – involves acting, then sensing then responding.

THE UNIVERSE OF HEALTHCARE DATA

Source: Health Care DataWorks
Data governance is the means by which decisions are made around what data to use and how to use it. Data stewardship ensures that the best possible data is captured, stored and utilized in a standardized fashion.

- How much data do we use?
- Is it scalable?
- Which sources of data will we use?
  - Structured
  - Unstructured
  - How will we assimilate all types?
- How quickly can we expect to have data available?
- Without veracity, predictions mean nothing!
DISCUSSION: WHAT ARE YOUR BIGGEST DATA CHALLENGES?
A Center of Excellence, also called a competency center, is a shared group of subject matter experts that supports the enterprise standardization, improvement and innovation. Successful Health Informatics COEs integrate a variety of methodologies for workflow redesign, data collection, analytics, change management and understanding of value realization. They ensure consistent use of these approaches across the organization. A COE team can act as a facilitator, incubator, problem solver, innovator and coach. The Informatics and Analytics COE serves as a convener of strategy and joint action across a hub and spoke operating model.
TECHNOLOGY APPROACHES TO BI

- No track record of success
- Analytics are limited to the data collected in their products

EMR, Revenue Cycle, ERP vendors

Point solutions

- One for JCAHO, one for physician performance, one for hospital operations, et al...
- Redundant patch work of data; costly; not extensible; enterprise wide analytics are not possible
- Scarce analyst skills are spread across multiple products

Generic, reusable enterprise healthcare data model

Build your own from scratch

- IBM, Oracle, etc.

- Costly, risky… would you build your own EMR?
## EVOLUTIONARY INVESTMENT REQUIRED

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>FFS</th>
<th>P4P</th>
<th>Penalties for Adverse/Preventable Events</th>
<th>Episodic Bundling</th>
<th>Disease/Chronic Care Management</th>
<th>Population Health Management</th>
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<tbody>
<tr>
<td>Financial Reporting &amp; Costing</td>
<td>Procedure-Level</td>
<td>Activity Level</td>
<td>Longitudinal</td>
<td>Per Member, Per Month</td>
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<tr>
<td>Quality Reporting</td>
<td>Core Measures</td>
<td>Process Measures</td>
<td>Outcome Measures</td>
<td>Condition Measures</td>
<td>Population Health Indicators</td>
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</tr>
<tr>
<td>Business Cases</td>
<td>Labor Productivity, Supply Chain Provider Level Performance Mgt</td>
<td>Service Line Management Demand Management Variation Reduction Patient Experience</td>
<td>Prevention &amp; Wellness Care Model Redesign Employee Health Mgt</td>
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</tbody>
</table>

Source: Adapted from “Building Value-Driving Capabilities: Business Intelligence”; An HFMA Value Project Report, January 2012

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ANALYTICS – A CYCLE

Capture Data

- Consistent practices across the enterprise to record structured data
  - Clinical
  - Operational
  - Financial

Share Data

- Across departments
- Across Care Settings

Integrate and Aggregate Data

- Data model
- Data validation
- Data warehousing

Provide Actionable Information

- Ongoing feedback
- Dashboards and scorecards
- Leverage data and clinical decision support real-time

Transform Practice Patterns

- Evidence based protocols
- Continuous quality improvement
- Prescriptive analytics
- Hardwiring for quality

Localize

- To new care settings
- Across care settings
- Across delivery mechanisms (e.g. telemedicine)

Influence Patient & Provider Behavior

- Patient engagement
- Patient feedback
- Patient compliance

Design Data Collection

- Standard data definitions
- Standard processes

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KEY CHALLENGES

- Trying to Do it All at Once
- Access to Data Outside the Organization
- Lack of Funding/Inability to Demonstrate ROI
- Limited Talent Pool
- Competing Technologies
- Lack of Data Stewardship

KEEP CALM AND Accept the Challenge
IT CAN’T BE DONE ALL AT ONCE

- Aim for a “quick win”
- Pick a specific area, narrow in scope
- Use a SWAT team to:
  - Deploy the minimal technology needed, using
  - The minimum data needed
- It’s not about the improvement; instead, use this proof of concept to learn how the organization uses and interprets data
QUESTIONS?

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