Your speakers

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Mike is RSM’s national Business Intelligence lead for higher education. He specializes in Business Intelligence, Data Warehousing, and Database Administration. He has participated in the architecture and development of many custom data warehousing and business analytic solutions.
RSM overview

On October 26, 2015 McGladrey LLP changed its name to RSM US LLP and united with fellow firms in its global network under the common brand – RSM

Our focus is to serve every client, every day, to the best of our ability.

Our Firm

RSM US LLP is the leading provider of audit, tax and consulting services focused on the middle market, with more than 9,000 people in 86 offices nationwide. We are a global CPA with more than 38,300 people in over 120 countries.

For 90 years, RSM has served as the first-choice to middle-market leaders. Our core values—respect, integrity, teamwork, excellence and stewardship—are the foundation of how we interact with clients and each other. We take pride in being accessible to our clients and proactive with our counsel.
Attendee Introductions

- **Name**
- **Job title**
- **Experience with Business Intelligence tools**
  - High, Medium, Low/None
Agenda

• **Situation and problem** - 30
• **Technology landscape** – 35
• **Implement an analytic platform** – 45
• **Keys to success** - 20
• **Case studies/demos** - 40
• **BI Trends** – 10
• **Questions and Answers** – 10
Audience Question # 1

• *How are the reports you use created?*
  – *BI tool*
  – *Auto generated static report*
  – *Manually created in Excel/Access*
SITUATION AND PROBLEM
Business Intelligence vs. Data Warehousing vs. Decision Support vs…

Decision Support

Business Intelligence

Data Warehousing

Data Analytics

Big Data
Business intelligence is about empowering organizations to truly leverage their data as an organizational asset to foster innovation, drive organizational excellence and create competitive advantage.
The challenge - typical situation

While most organizations have a wealth of data, they only use a portion of it in their decision making process.
Many do not have the ability to effectively and efficiently transform their raw data into actionable information.
The challenge – the impact

The result of a disjointed data eco-system can have a significant negative impact on organizations

A silo’d data environment can lead to:
- Conflicting answers to the same question
- Different definitions for the same data element or calculation
- Timing differences
- Data quality issues

and result in:
- Less than optimal decision-making
- Inefficient operations
- Lost productivity
- Unsatisfied customers
The challenge - indictors

There are certain indicators that business intelligence solutions can be beneficial to an organization

- Transaction systems not integrated
- New software implementation
- Current reporting not “actionable” (not timely)
- Reporting and analysis requires a significant manual effort
- Known data integrity issues
- Conflicting reporting
- Failed or stalled analytics initiatives
The challenge

✓ Timely

✓ Relevant

✓ Accurate

✓ Actionable

Struggling to Find the Value in Data

“Why is this data important to me?”

“What matters right now?”

“What should I be looking at?”
State funding has decreased significantly
The US government is scaling back funding for university-based research programs
Declining traditional enrollments
Shift in modality
Net tuition rates are rising as both need and merit aid programs diminish and families are left with a larger fraction of the bill
Limited ability to scale (up/down) the cost of instruction

Higher Education decision makers are being forced to evaluate the efficiency and cost structure of their institution to cope with the industry’s changing landscape
RSM’s business intelligence approach provides the framework to turn an organization’s raw data into the actionable information.
Transforming your organization requires a trusted analytics base

The approach to building a solid data foundation centers:

- **Extract the data from the authoritative source**
- **Transform the data from disparate sources into an integrated view that is easily understood by the data consumers**
- **Load the data into a structured data model**
Driving organizational excellence, competitive advantage and proactive decision making

The approach to building a solid data foundation centers

- Determining the focus of the reporting and analytics required to support your business goals
- Understanding the preferred information delivery methods of your data consumers
- Selecting the appropriate enabling technology that balances your required capabilities with total cost of ownership
Managing your data as a strategic asset for competitive advantage and organizational excellence

Leveraging organizational data for a competitive advantage and organizational excellence centers on three main concepts

- Defining a data strategy
- Establishing a pragmatic data governance framework
- Implementing a flexible data and technology architecture
The solution – BI approach

Reporting, analytics and information delivery
(innovative and robust reporting and analytics at your fingertips)

Cost containment
Revenue optimization
Profitability analysis
Operational efficiency
Quality analysis

Marketing Spend Analysis
Comparative analytics
Logistics optimization
Industry-specific analysis

The Data Foundation
(Integrated, trusted information structured around your business)
• *Highly interactive and intuitive visual-based exploration*

• *Customer experience and operations*

• *Advanced analytics*

• *Flexible deployment options*
  – *Tableau Online*
  – *Tableau on-premises*
Qlik

• **BI Leader for 7 years in a Row**
• **In-memory engine and associative data model**
• **Multiple products:**
  – QlikView
  – QlikSense
  – Nprinting
Qlik – QlikSense Video
Qlik – NPrinting Video
Power BI

• **Continued investment**
• **Ease of use plus complex analysis**
• **Active community**
• **Advanced analytics**
• **Price ($9.99 per user/mo)**
How to Choose

- Requirements, Requirements, Requirements
- Leverage existing investigates
- Determine technology skill sets
IMPLEMENT AN ANALYTIC PLATFORM
How to start
How to start

✓ Create project charter
✓ Determine stake holders
✓ Gain support from leadership
✓ Establish cross-functional, knowledgeable teams
## How to start

### Discovery Phase
- Interview key reporting and process owners
- Review existing documentation
- Review reporting requirements
- Review existing reports
- Review existing key performance measures

### Analysis Phase
- Analyze data collected and determine key elements
- Analyze origins of data
- Assess technology used within existing processes
- Assess current mix of manual versus systematic processes
- Evaluate gaps in current reporting requirements
- Evaluate gaps in key performance measures
- Analyze integration of additional reporting processes

### Design Phase
- Translate the requirements into a conceptual model
- Framework development

### Deliverables
- Discovery summary document
  - Key / common data elements of reports
  - Key reporting definitions
- Analysis summary document
  - KPI/Measure template
  - Security
  - Technology/tools
  - Refresh schedule
- Design deliverables
  - Data Model
  - Implementation plan

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• Complete 3-5 KPI/Measure lines on the template
• All columns in RED are mandatory
## Activity - Example

<table>
<thead>
<tr>
<th>Academic Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type (Rate)</td>
</tr>
<tr>
<td>X Credit Hours</td>
</tr>
<tr>
<td><strong>Gross Tuition</strong></td>
</tr>
<tr>
<td>- Institutional Aid</td>
</tr>
<tr>
<td>- Refunds</td>
</tr>
<tr>
<td>+ Course Fees</td>
</tr>
<tr>
<td><strong>Net Revenue</strong></td>
</tr>
<tr>
<td>- Instructor cost by section</td>
</tr>
<tr>
<td>- Non-instructor variable direct costs</td>
</tr>
<tr>
<td>- Other OpEx (fixed direct costs)</td>
</tr>
<tr>
<td><strong>Academic Department Costs</strong></td>
</tr>
</tbody>
</table>

### Academic Department Gross Margin
Activity - Example

Net Revenue

Registrar
Course and Student

Financial Aid
Institutional Student Aid

Human Resources
Instructional Compensation

Direct Cost

Finance & Acctg
General Ledger/Finance

Indirect Cost
Activity - Example

- Margins by:
  - Program
  - Department
  - Course
  - Section
  - Instructor
  - Instructor-type
  - Student
  - Student-type
  - Modality

- Establishes benchmark for year-to-year improvements
- Supports what-if scenario analysis
  - Changes in tuition rate
  - Growth / declines in student counts
  - Efficiency changes (e.g. changing assumption on faculty workload)
KEYS TO SUCCESS
Keys to success - model your data

Would anyone build a house without a blueprint?

- Numerous aspects to consider
  - Structure:
    - Foundation, framing, roofing, siding, etc.
  - Utilities:
    - Plumbing, electrical, gas, etc.
  - Finishing:
    - Walls surfaces, fixtures, lighting, appliances, etc.
- Just give a spreadsheet to the builder?
Keys to success - model your data

- Ledger
  - Ledger ID

- Ledger Group
  - Ledger Group Code

- Date
  - Date YYYYMMDD

- Source System
  - Source System ID

- Account
  - Account Number

- College Program
  - College Program Code

- Project
  - Project ID

- Campus/Operating Unit
  - Campus Code

- General Ledger Fact
  - GLJournalID
  - GLJournalLineNumber
  - GLJournalDate
  - AgencyCode
  - Unposted Sequence Num
  - Ledger ID
  - Department ID
  - Campus Code
  - Account Number
  - Account Number
  - Posted Date
  - Monetary Amount

- Business Unit/Agency (College)
  - Business Unit ID

- Division
  - Division Code

- Sub-Division
  - Sub-Division Code

- Fund
  - Fund Code

- Department
  - Department ID
Keys to success - data quality

• # 1 reason for project failures

• 2 types of data quality:
  1. Technical data quality
     • Null values, data type mismatches, etc.
     • A payroll date field contains “Mike D”
  2. Business data quality
     • Every GL record must contain a department code
     • Every course must contain an instructor
Keys to success - data governance

Data Governance
- Executive sponsor
- Executive committee
  - Working group
  - Working group
  - Working group

- Strategic direction
- Approvals / denials
- Approval requests
- Status updates
- Escalation

Information Technology
- Key Roles:
  - Programmers
  - Technical analysts
  - Tech. project managers

- Technical project resources
- Infrastructure fulfillment
- Resource requests
- Infrastructure requests
- Data standards, best practices

Center of Excellence
- Key Roles:
  - Data architect
  - PMO lead
  - Analyst

- Project guidance
- Standards
- Best practices
- Education
- Communications
- Project status
- Data requests
- Maintenance / enhancement requests

Data Consumers
- Key Roles:
  - End-users
  - Business analyst

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Keys to success - data governance

Data governance focuses on managing data as a strategic asset

Defining the processes, policies, best practices, organizational constructs and enabling technologies through which organizations pro-actively define and manage their data as an enterprise strategic asset

Management and oversight + Enterprise view + Continual improvement = Enterprise data governance

Focuses on the pro-active management of enterprise data
Focuses on defining and promoting the enterprise use of data
Focuses on the continual improvement to the overall BI environment

- Governance organization
- Portfolio management
- Monitoring and compliance
- Data standards
- Enterprise MDM
- Enterprise metadata
- Data quality
- Best practices
- Strategy management
- Continual review and assessment
Effective data governance requires well defined goals and objectives, supported by the right people, processes and technologies.
Keys to success

- Leadership buy-in
- Business project not IT
- Phased approach
- Actionable
- Dedicated liaison to oversee project success
CASE STUDIES
Eastern Iowa Community College needed access to advanced analytics that focus on student and course information. Key performance indicators include:

- **Section analysis**
- **Student success**
- **Snapshot reporting**

**Notes**

- **Integration:**
  - Data refreshed on a nightly basis
  - Includes extensive logging and automatic notifications

- **Load Processing:**
  - Data stored in a database and excel files
  - Include “snapshots” of the data

- **Business Rule Application**
  - Remedial indicators
  - Enrolled in previous and next term indicators
Example 2

- https://vimeo.com/27060669
Higher Education organization needed a data foundation that integrated Finance/Budget, Payroll, HR and manually maintained data. Key performance indicators include:

- **Budget to actual**
- **Payroll to position budget**
- **HR analysis**

### Notes

- **Integration:**
  - Loads data from a data base, csv files and excel files
  - Integrates with SharePoint for manually maintained data entry

- **Business Rule Application:**
  - Data entry error reports

- **Data De-Duplication:**
  - 3 different ID for same person. School, State, Payroll

- **Preventive Data Quality:**
  - **Business Data Quality:** Identifies GL transactions that contain invalid combination of codes (Account, Department, Fund)
  - **Technical Data Quality:** Only load records with valid dates
BI trends
BI trends – governed data

Governed data refers to data that is of high-quality and has been vetted by the enterprise to have met certain standards prior to use by end-users

- Data quality
- Data governance
- Master data management

- Organizations are realizing that for self-service to work, everyone needs to be using a consistent base of data
- Data governance is being viewed as an enabler instead of a distractor
- Master data management is experiencing a renaissance as it is the “glue” that binds data together
- As organizations move into advanced analytics, data quality takes on a whole new level of importance
BI trends – cloud

Cloud BI refers to business intelligence on a cloud platform vs. on-premise

Reporting and analytics

Data foundation

Ability to do more

• Cloud BI has been the trend for several years, but more from a data foundation perspective

• “Data gravity” is moving more and more of the reporting and analytics to the cloud

• While the main driver in the past was cost / skill set driven, it is extending into the ability to have a more complete analytics platform
Advanced analytics refers to using advanced analytical techniques for such things as predicting the likelihood of future events.

- **Predictive and prescriptive analytics**
- **Machine learning/cognitive**
- **A.I.**

- Organizations are maturing in their use of data and are looking to move beyond retrospective reporting and analytics.
- Vendors are expanding their platforms to include more advanced analytics.
- The maturation of big data and IoT products is making the move to advanced analytics more realistic.
- Advanced analytics can be a true competitive advantage (or disadvantage).
BI trends – big data / IOT

- In many ways, big data and IoT are still trying to find themselves
- Social media and unstructured data are playing a key role in big data and IoT
- Organizations are finding the right use cases for big data and IoT (it’s not longer just a cool technology)
- The technology landscape is maturing
QUESTIONS AND ANSWERS?