This paper provides an overview of the 2018 Innovators Forum with a distillation of the key discussion points and recommendations regarding Business Intelligence (BI). The group engaged in robust dialogue about improving Business Intelligence, but also focused on pragmatic ideas and practices that can be acted on today. The paper outlines a strategic Business Intelligence framework and recommendations for critical practices procurement leaders should follow.
# TABLE OF CONTENTS

EXECUTIVE SUMMARY ............................................................................................................................3
ABOUT THE INNOVATORS FORUM ........................................................................................................4
ATTENDEES ...........................................................................................................................................5
CASE FOR CHANGE ...................................................................................................................................6
STRATEGIC PURPOSE OF BUSINESS INTELLIGENCE .......................................................................7
BUSINESS INTELLIGENCE FRAMEWORK .............................................................................................8
  1) PRIMARY USES OF .........................................................................................................................9
  2) MATURITY MODEL ..........................................................................................................................10
  3) STAKEHOLDERS .............................................................................................................................12
  4) PEOPLE ...........................................................................................................................................13
  5) TECHNOLOGY CONSIDERATIONS .................................................................................................14
BARRIERS AND CHALLENGES ...............................................................................................................14
A CHIEF FINANCIAL OFFICER’S PERSPECTIVE ..................................................................................15
WHAT TO DO AT THE BEGINNING STAGES OF THE MATURITY MODEL .........................................16
ROUND TABLE DISCUSSION FROM THE INNOVATORS GROUP ......................................................17
SUMMARY ...............................................................................................................................................19
ABOUT US ..............................................................................................................................................20
APPENDIX
  1) RESOURCE EXAMPLES OFFERED BY YOUR COLLEAGUES .......................................................21
  2) BI TECHNOLOGY TREND RANKINGS ............................................................................................27
  3) SUGGESTED READINGS ...............................................................................................................30
Many procurement teams have embraced the role of data analytics in the past several years. Some have purchased spend analytics software to help them understand spend patterns at a deeper level and some have built procurement data warehouses and created engaging scorecards and analytics to be shared with internal customer groups. As procurement has advanced in analytical capability it is important to make sure that the function does not become predominantly a report generation engine. If we are to make a major impact on value creation, then procurement needs to advance toward producing true business intelligence. This requires us to go beyond spend pattern reviews and to bring advanced data analytics to the table to answer bigger, strategic questions. Answers to the strategic questions usually requires strong data analysis capabilities. The Innovators Forum group is focused on advancing their business intelligence functions to the next level and believe it is a critical practice area regardless of size or capability.

Colleagues who have embraced strong business intelligence practices report the following benefits:

- Their **brand image** has increased;
- **Key internal customers** involve them earlier in procurement planning processes;
- They have continuously improved **procure-to-pay processes**;
- They bring information to the table that **changes spend behaviors** in a positive manner;
- The **executive team** asks for their contributions on more strategic questions; and
- They **participate collaboratively** on more cross-functional problems that have major value impact.

The first step in building a solid business intelligence function is to understand the central importance of data in answering the bigger, more strategic questions. We should all be striving to make data informed decisions. The analysis and professional presentation of data is the best change management tool that procurement possesses. This shift in mindset will set you on a path toward a more strategic role, one where procurement is involved to a greater degree in planning decisions on the front-end of the procurement process.

A greater understanding of procure-to-pay operational data can also pay significant dividends in reducing the amount of labor devoted to pure transactional issues where the value being added is limited or non-existent. The more that procurement departments can make continuous operational improvements by deploying advanced data analytics, the more that labor hours can be re-purposed to activities that make an impact.

If you believe data informed decisions lead to better results than anecdotal opinions, then you are an advocate for increasing business intelligence capabilities. The first step on this journey is to create a vision that includes the key business intelligence roles and functions you would like to accomplish at a basic, intermediate or advanced level. Focus intensively on the basic level and execute at a high level in this domain before spending time and effort on fancier capabilities. A lot can be accomplished by performing the basic tasks well.

At the end of the day, strategic value is created through collaborative discussions between procurement, suppliers and key internal customer groups using data as the basis for dialog, goal setting and initiative chartering. A key test to determine whether procurement is an essential strategic partner is the extent to which key stakeholders call you before initiating an important procurement decision. The better skilled we are in data analysis and business intelligence the greater likelihood this will happen.
The National Association of Educational Procurement (NAEP) convened the 7th annual Innovators Forum in Denver, CO on January 8th and 9th, 2018. College and university leaders gathered to discuss future trends in higher education and their impact on procurement. The purpose of the Innovators Forum is to engage in an analysis of the major issues impacting higher education institutions and procurement professionals and to better inform institutional stakeholders on alternative ways to approach these challenging issues.

The previous NAEP Innovators Forums resulted in distribution of white papers titled “Talent Management”, “The Procurement Brand”, “Enhancing Supplier Value and Performance” and “Customer Engagement Management”. Feedback from those attending this year and in previous years suggests these white papers are powerful tools for senior leaders and procurement professionals to learn about the challenges confronting higher education procurement and to educate administration about those challenges.

Building upon the momentum of previous Forums, which explored a broad range of issues affecting higher education and procurement, this year’s group was asked to consider the topic of Business Intelligence.

The outcome of this year’s discussion continues the Forum’s goal of developing roadmaps that procurement professionals can use to better understand complex procurement topics, communicate those concepts effectively to senior leaders and to improve results in support of critical university strategic goals.
New attendees bring fresh ideas and insight. This year’s Innovators Forum was assembled by NAEP with the intent of deepening business intelligence discussions. Attendees included administrative and C-level executives along with procurement leadership, business officers and key suppliers. The team was committed to fulfilling the mission of the Innovators Forum by capturing and sharing insights with each other — and with their colleagues in higher education and procurement via this white paper — so that other institutions and industry professionals may benefit from their exchange of ideas.

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How can we ‘sell’ the idea that a greater procurement business intelligence capability is needed? A common mistake that many procurement leaders make is starting from the proposition that new technology is required. The Innovators’ argue that a better approach is to start with the questions or outcomes that the executive team is trying to resolve.

Let’s assume for this discussion that you are the Chief Procurement Officer and you need to convince the Chief Financial Officer to support your proposal to invest greater resources in business intelligence. The Chief Financial Officer is wrestling with big strategic questions and is charged with finding the funds to deliver on various strategic priorities. The economic model for most universities has changed over the years such that state funding is unreliable, federal funding is not as robust and there is considerable pressure to make college affordable and therefore the ability to increase tuition rates is challenged. It is natural that when faced with a set of management challenges all of us will gravitate to the easier solutions first before pursuing the more difficult courses of action. In this scenario, increasing tuition rates is the least effort path. However, now comes the reality that to continue innovating and competing for the best students, the executive team must deploy some of those more difficult solutions. The Chief Financial Officer wants to know how you as the Chief Procurement Officer can be an ‘essential strategic partner’ and help him or her to find the resources necessary to fund the university’s strategic priorities.

The Innovators Forum group suggests the following outline for your elevator speech to convince the Chief Financial Officer to support your proposal for increased business intelligence resources. Each situation is different, you should tailor this general outline to your circumstances:

- Let’s first define procurement business intelligence as the people, processes and technology necessary to make use of all available university data for the purposes of making data informed decisions that answer the key strategic questions needed to deliver outcomes that support university priorities;
- The only reason to invest in business intelligence capabilities is that we need to change the current behaviors of key stakeholders in order to impact structural costs;
- There are substantial cost and value opportunities to harvest, but they are beyond the traditional solutions of better contracts and prices;
- The increased value proposition will come from our ability to interact with strategic internal customers and strategic suppliers in a collaborative and partnership manner to pursue meaningful goals that require innovative thinking;
- Solutions to strategic challenges must come from ‘data informed’ decisions and not anecdotal opinions;
- Decisions that are ‘data informed’ in the procurement world require capabilities beyond producing traditional spend cubes;
- The ability to access the right data and apply it to the right problems and present it in a professional manner is the single greatest change management tool we possess; and
- If you believe that procurement should advance from its traditional role of back-end transaction processor and move forward to work with stakeholders in a strategic fashion, then it is essential that our capabilities in business intelligence increase.

“It is difficult to change a culture without data.”

Kelly Fox, Senior Vice Chancellor & CFO, CU-Boulder
There are a variety of definitions for business intelligence. Some definitions emphasize technology tools, and some make a distinction between business intelligence and advanced data analytics. For purposes of the Innovators Forum discussion we used a straightforward definition: “utilizing information and data inputs for informed conversations to drive a desired outcome.” The more skilled we become with business intelligence should mean that we can anticipate and predict certain results and focus on outcomes that align to a strategic mission. Our goal is to provide insights from data that increase stakeholder awareness and understanding and that spurs decisions to pursue alternative courses of action that bring significant and sustained value for the University.

In many cases our data analysis and business intelligence capabilities have become report generation engines where a set of standard, spend dashboards are pushed out to internal customer groups on a periodic schedule. These dashboards can provide useful information and be well-received by customer groups. However, a more advanced approach would start with an understanding of the business problem(s) to be resolved and the series of questions that are useful to the solution. In this way our research and business intelligence capabilities are focused on making an impact that matters to customers. If all of our time, effort and money related to business intelligence is not targeted toward changing behaviors and mindsets that will make a substantial difference, then we are probably wasting resources.

Historically, Procurement teams have focused on some form of spend analytics to drive their business intelligence offerings. However, there are many other uses for business intelligence in the procurement and supply chain setting. The missing element is Business Insights that are targeted to addressing the right questions. The group had a robust conversation on this topic to open the Innovators Forum discussion. The following nine (9) key business issues were suggested as key targets for business intelligence efforts:

- Enrollment issues;
- Customer understanding;
- Bottom line pressure (cost containment and revenue enhancement);
- Internal controls;
- Buy v. Build;
- Sustainability;
- Risk v. speed;
- Space utilization; and
- Procurement operations speed (cycle times) and inefficient workflows.

With a greater amount of discussion time, the topics above could be turned into more specific questions to be addressed. For example, what are the factors that influence students to select our university and how does that relate to how we spend money? What problems are my key customers trying to solve and how can we be a partner in their solution? How big is the gap between what the university would like to spend on strategic initiatives and what is available? What portion of this gap can the procurement team provide or influence? Do we need to add buildings and square footage to accommodate enrollment growth, or can we use existing space more efficiently? Can we increase the percentage of procurement time devoted to strategic issues and reduce the time spent on low value transaction processing? Can we improve our service delivery to key customers in a way that is recognized and improves our brand image?

“Too many organizations build data repositories, lay BI on top and then expect business users to jump right in... what works much better is a top-down approach, one that’s about business outcomes. We don’t start with ‘where’s the data?’ We start with solving a business problem”

7 Keys to a Successful Business Intelligence Strategy, Mary K Pratt, CIO, 9/26/17
The term ‘business intelligence’ can mean a variety of things to different people. For purposes of the discussion and this white paper we think of business intelligence as the set of people, process and technology characteristics that will help us make a strategic use of data to better inform stakeholders about decisions that will impact key business outcomes. If Business Intelligence is performed well, then we have a great opportunity to work collaboratively with key stakeholders on initiatives that matter to them. Anything of strategic importance generally requires accessing and analyzing data at some level of sophistication. To increase our capabilities in the BI arena there are several elements to consider. These are described in the BI Framework shown below and formed the basis for the 1 ½ day Innovators Forum discussion. The BI Framework is about understanding the key issues that our customers are trying to solve and working backwards toward the data, technology, and methods we are going to use to deliver the business insights that answer the strategic questions that address those key issues. Done well, business intelligence can enhance our brand image and help us become strategic partners to campus constituents.

![BUSINESS INTELLIGENCE FRAMEWORK Diagram]

1. Technology Considerations
   - 
   - 
2. Primary Uses
   - 
   - 
3. Stakeholders
   - 
   - 
4. Strategic Purpose
   - 
   -
Imagine a conversation between you and the Chief Financial Officer. You are making an argument to enhance the business intelligence capabilities of the procurement team. A basic question you might be asked is ‘what are you going to use it for’? It is important to begin with the end in mind and think clearly about how you would answer this question. We want to make an impact on greater strategic questions. How will you use business intelligence to advance this goal?

In small and large group discussions the Innovators Forum group talked about how they use business intelligence. The following list reflects their input ranked by the uses they deemed most important:

- Increase spend analysis and spend transparency;
- Improve relationships with customers, leadership and suppliers;
- Jointly develop performance metrics to establish trust with customers;
- Review existing policies and evaluate whether changes are needed;
- Provide data to influence and change behaviors that make an impact;
- Establish useful benchmarks (within the organization and between institutions);
- Establish and measure process efficiency improvements (free capacity to work on strategic topics);
- Influence and improve contract compliance through enhanced relationships;
- Build Total Cost of Ownership models to get beyond acquisition price as the only lever of importance;
- Improve customer satisfaction and stakeholder engagement;
- Understand true business problems and the behavior driving the cost;
- Curate useful content (knowledge management);
- Formulate useful business cases and present them in a story telling fashion;
- Increase use of process automation tools; and
- Predictive analytics and forecasting.
A useful exercise for any procurement role is to think about the outcomes and deliverables you would receive if it were operating at three (3) different levels (basic, intermediate and advanced). With respect to Business Intelligence, the Innovators group places themselves at the beginning of the Intermediate stage.

It may be difficult to reach the Advanced level, however, thinking about this achievement level stretches your thinking and forces you to go outside of your comfort zone.

In small group discussions, the Innovators Forum team debated this concept and their observations are listed below.

**Procurement BI Roles and Responsibilities at a Basic level:**
- Understand spend cubes and how much the institution spends in various categories;
- Data verification and testing – ensure the accuracy and quality of data;
- Be skilled at accessing data from different systems;
- Analyze and make use of historical data to make decisions;
- Assemble basic spend and procurement data and send it out to key stakeholders; and
- Identify ‘low hanging fruit’ cost savings.
Procurement BI Roles and Responsibilities at an *Intermediate* level:

- Building a procurement data warehouse or data mart that integrates separate data sources;
- Use data analytics to build meaningful KPI’s and work collaboratively with key customers and suppliers;
- Enhance your targeted and strategic reporting to address issues that are important to customers;
- Enhance the velocity and accuracy in which questions can be answered;
- Use data analysis to begin customer conversations that address key issues and problems;
- Enhance the talent level of individuals performing data analytics;
- Increase the sophistication level of technology tools with an emphasis on data visualization; and
- Begin using data to build models that will forecast spend. This can be particularly useful in the Construction and Facilities spend category.

Procurement BI Roles and Responsibilities at an *Advanced* level:

- Use data to tell compelling stories;
- Develop self-service and increased automation for completing basic and routine data inquiries;
- Using advanced data presentations to foster increased collaboration among customer groups;
- Using data to support and provide value to other key areas like construction and facilities;
- Having talented BI people who can independently interact with customers to understand problems and develop research methods to resolve;
- Major decisions are increasingly informed by solid data analytics; and
- Ability to create data models that provide predictive analytics and scenario testing.
Improving our relationships with stakeholders is a primary reason to enhance business intelligence capabilities. Consider the Chief Procurement Officer’s goals in this context:

- To become an essential strategic partner to the University;
- Being a strategic partner implies that stakeholders call us on the front-end of planning activities;
- They call us for advice and we deliver expertise that ‘moves the needle’ and creates value for them;
- A key characteristic of ‘moving the needle’ is our ability to bring actionable intelligence to the table; and
- Our primary reason for investing in BI activity is to change behaviors that will create strategic value.

There are numerous cross-department or cross-campus collaboration opportunities where substantial value can be created. Experience suggests the best way to begin and maintain these conversations is with robust business intelligence that brings insights to the table and increases data informed decisions.

There are many potential Key Stakeholders that would benefit from procurement led BI reporting. The Innovators’ discussed the following stakeholder groups:

- Executive Leadership, Financial Leadership / Business Office Leadership;
- End Users / Customers, Facilities, IT, Academic Admin & Research Admin;
- Strategic Partners/ Suppliers; and
- External Parties, Alumni, Donors, Tax Payers.

It was difficult within the small and large group discussions to reach a consensus on the most important stakeholders. Each university has unique needs and issues and the importance of certain stakeholder groups varied widely among the participants. There is not a right or wrong answer to this question, but it is important to have the discussion within your procurement team and to think about how you will engage the stakeholder groups important on your campus in a way that increases value.

As a by-product of the stakeholder discussion there were a few interesting observations made by the participants that may be of value to your procurement team as follows:

- Define what the term ‘value’ or ‘benefit’ means on your campus. It should include more than ‘cost savings’. You might think about the broad buckets of cost, quality and service as a starting point;
- Think about how your suppliers can be a partner in creating value – jointly set meaningful strategic goals with them;
- Follow the spend, that is generally where the key stakeholders can be found;
- Establish a set of goals with your key stakeholders where service and value improvement can be measured over time; and
- If you have the resources, consider deploying customer engagement software (e.g. Salesforce) to help you track customer interactions.
If you decide to increase business intelligence capabilities, the most important resource is talented people. The ideal person will be somebody who has excellent technical skills, but also the ability to communicate with stakeholders in a professional manner to help solve business issues. You would like someone who can do more than produce reports, an individual who will introduce suggested business intelligence into collaborative discussions. We are describing a resource with exceptional capabilities that may be difficult to find in one person.

The Innovator’s debated the **hard and soft skills** they would look for in a person to **lead their BI team** to an advanced level of execution. The following attributes resulted from this discussion:

- **Hard Skills**
  - BI tool sets;
  - Technically proficient in a broad spectrum of data platforms;
  - Data mining;
  - Process mapping, lean six sigma, process improvement;
  - Proficiency in tools of the trade and knowledge of what is available;
  - Ability to extract information from many areas and translate it;
  - Database management;
  - Problem Solving; and
  - Quantitative Skills.

- **Soft Skills**
  - Curiosity
  - Storytelling and communication;
  - Listening;
  - Influencing and persuasion;
  - Relationship building;
  - Change management;
  - Design thinking;
  - General business understanding;
  - Leadership;
  - Procurement knowledge;
  - Ability to adapt and evolve as new tools and situations develop; and
  - Ethics and Integrity

“The word intelligence implies that knowledge, business insights and suggestions to change behavior must be conveyed by a talented person. The most important role leaders can play is to search, find and recruit talented individuals to your team.”

*Jim Knight, Innovators Forum Facilitator*
There are a lot of technology trends and buzzwords pertaining to the term business intelligence. The capability of software to deliver data in a variety of ways and on a variety of issues is increasing substantially every year. It can be easy to get lost in all of these trends and lose focus on the things that matter to procurement and that can make an immediate impact on your operation. The Innovators’ reviewed a list of twenty trends identified in the *BI Trend Monitor 2018 – The World’s Largest Survey on BI Trends, BARC Research Study (see Appendix 3, reading #3)* and rated them according to their individual thought. We then reviewed the rankings and discussed the importance of staying focused on the top 5 or 6 technology considerations.

This exercise was patterned off Warren Buffet’s goal setting approach. He argues that you should sit down each year and make a list of 25 goals you would like to achieve. You should then review the list a second time and focus on the 5 goals that are most important for you to get done. Label the 5 goals as list A and the remaining goals as list B. Don't do anything on list B until you have accomplished the items on list A. This philosophy translates well to all the business intelligence technology considerations. You can review the full list, the rated scores and the full rankings *in Appendix 2 on page 28.*

Top 5 BI Trends for the Procurement and Supply Chain function:
1. Collaboration;
2. Data storytelling;
3. Master data and data quality management;
4. Data discovery and visualization; and
5. Data governance.

There are barriers and challenges to anything that is worth pursuing. It is beneficial to acknowledge them so that leaders can construct a plan to overcome them. As it relates to business intelligence the Innovators Forum group identified the following *barriers and challenges* that prevent them from reaching the full potential of BI:

- Getting stakeholders curious, acquainted, and familiar with the data.
- Delivery vs. analysis – there is a gray line between knowing the data and telling a story with it;
- Data security / Warehouse certification is a bottleneck;
- Gaining access to all relevant data sources;
- Reliance on IT Resources might cause bottlenecks;
- Leadership support to provide needed resources;
- Major transformation projects and hiring freezes may challenge your ability to get resources;
- There are always certain groups and individuals who want to work independently in silos;
- Finding talent with the right expertise and skills; and
- There are many potential paths to follow, how to know the right one?
Q: Why did you recently invest in enhanced BI capability for the Boulder campus?
A: We need to begin answering the big, strategic questions around here. For example, why do students enroll at CU and what factors encourage them to stay? How can we save big dollars to reinvest in our strategic priorities?

Q: How does BI help you with these bigger questions?
A: The answer to bigger questions requires management of entrenched cultural issues. People like to say this is the way they have always done it and they prefer to act independent of a central organizing structure. The only way to tackle issues of this magnitude is to increase the amount of data informed decision-making.

Q: What was your first priority to enhance the BI capabilities at CU-Boulder?
A: You must have talented people who bring advanced technical skills, but also have the ability to visualize, present and communicate complex data in understandable ways. We invested in this talent and set them on a course to build a sophisticated data infrastructure that we call a Data Lake. A Data Lake is useful when you are not sure what questions need to be addressed in the future. A data warehouse, on the other hand, is a structured format that presumes you already know the questions you want addressed.

Q: Will the Data Lake be available to people outside of your organization?
A: Yes, we are making an investment to build a sophisticated data infrastructure that is accessible to the community and we do not want to reinvent this capability. We are working on the data governance model and procedures to allow direct access for key constituents and access through our Office of Data Analytics for others.

Q: Should BI capabilities reside in procurement?
A: Yes, but I want to see a strong ROI and I want procurement to pursue answers to their own big strategic questions by working collaboratively with folks on this campus. It will be important for procurement to interface with our BI team in that pursuit.
WHAT TO DO AT THE BEGINNING STAGES OF THE MATURITY MODEL?

- Determine if there are BI resources in other departments that you might be able to access;
- Understand that data informed decision-making is a universal goal;
- Take advantage of smaller size to have more collaborative discussions with key stakeholders to understand the business insights you can bring to the table;
- Advanced technology tools are great if you have them, but a lot can be done with basic queries and advanced EXCEL or ACCESS capabilities. Be exceptional at the basics;
- Understand where the data is and how to get it;
- Pick one or two areas where data informed conversations will pay dividends and focus on getting results; and
- Access NAEP resources and educational tools.
One of the great benefits to any forum of colleagues is that people learn from each other and become interested in the activities occurring on other campuses. Readers of this paper may find it useful to understand how the Innovators Forum group is pushing the envelope in Business Intelligence on their campuses. The following are key ideas expressed during a round table discussion on this topic:

- Depending on your circumstances it may be difficult to gain support for BI. Often, procurement reports through an accountant heavy leadership team that may place a heavy emphasis on compliance activities. The key is to make BI resonate with key stakeholders in ‘business’ functions;

- Increased levels of collaboration are often important to the leadership team. Use this as a basis for your business case. BI if used appropriately can foster a significant amount of collaborative discussions that will yield value;

- Regardless of your size or available resources we can all get better at visualizing and displaying data to tell a compelling story. We should always be working to improve on this;

- There a number of different paths you can take with BI. Think it through and make sure you can handle the basic functions at a high level before trying to do too much;

- A best practice is getting leadership groups and chief business officers to set clear program objectives and expectations;

- Develop department scorecards that focus on what is important to key customers and use it to improve service. Having the ability to show how a department compares with its peers on certain metrics creates internal competition and a desire to do better;

- There is a lot of data and it can be overwhelming at times. Start small and evolve. More is not necessarily better. Make sure the data you select is relevant to the people receiving it;
• Make sure to utilize available software to standardize data. Access to resources is always a challenge. Use software to improve workflow efficiencies and free existing resources for more productive pursuits;

• It is important that you are able to communicate the value you produce. It is difficult to make an argument for more resources if you cannot do this. At some point you will have obtained most of the available value from price reductions and contract management. The only way to create more strategic value and to gain a ‘seat at the table’ is to build relationships with key customers and help them with bigger issues and problems. The only way to do this is to have a solid BI capability;

• On our campus we have a heavy emphasis on lean six sigma and process reengineering. This emphasis provides a level of support for finding the right talent and the right systems to bring more data to the table to break down silo thinking;

• We have used BI to create better business cases for all kinds of things. One example is developing a greater partnership with capital programming, construction and capital contracting. There is a tremendous amount of spend in these areas and BI can play an important role in developing better ways to manage it;

• Most universities like to have dashboards and some level of KPI reporting. Think about what gets selected for this reporting and make sure it is relevant to changing behaviors and making an impact on spend management;

• In the past we chased opportunities in an ad hoc way. We are a huge research university and cost savings is not top of mind to the research community. It is like having a hundred small businesses that don’t care about their cost structure. It has been a journey, but we have steadily increased our competency in data analytics and business intelligence to gain a better ‘seat at the table’. We are strategically pursuing opportunities where collaboration is needed for a positive outcome; and

• There have been a lot of great points made throughout this discussion. I would encourage everyone to make sure that their BI initiative is tied to some element of the university’s strategic plan and the Procurement strategic plan.
Many procurement departments are fighting a pervasive brand image of being back office transaction processors. Often, procurement has been given the responsibility to manage the contracting activities for certain commodities and or certain key suppliers. As time goes on, it is likely that procurement has done a good job obtaining great prices and arranging contracts for a high percentage of spend. If we rest on these accomplishments, then there isn’t much left for us to do except to maintain the status quo. This is a common story regardless of enrollment size, research activity and resource strength.

Most procurement professionals want to make a greater strategic impact. This requires involvement with more complex spend management issues that are more directly tied to the university’s strategic objectives. In the ideal world, our key customers would call us on the front-end of major procurement projects and they would ask us to be strategic and supporting partners to help them achieve their objectives and manage the spend as professionally as possible. Before a key customer would call us for this level of support, they would need to feel comfortable that we have the expertise, professionalism and capability to provide that level of service.

The ability to be a strategic partner in this manner and to play a role on major strategic issues requires a level of excellence in business intelligence. This does not mean that you need all the latest technology and fancy reporting capabilities. It does mean that you have an ability to ask the right questions, that you target your data analysis to provide business insights that will inform decisions that solve complex problems and that you have very good presentation and communication skills.

Procurement departments who can enhance their BI capabilities and make continual progress in this area will definitely sharpen one of the most important available tools to enable participation at a strategic level. If you want a ‘seat at the table’ you must strive for excellence in business intelligence and you must sharpen your ability to visualize and communicate data at an advanced level. Brand image, respect, a ‘seat at the table’, becoming a strategic partner are elements that must be earned - they are never given. Solutions to complex and strategic procurement spend challenges are almost always a data problem that requires some level of sophistication to conquer.
**NAEP** is the association of choice for educational procurement professionals dedicated to their continued professional development and to reinforcing the strategic role of procurement in education. Since the 1920’s, NAEP has been the non-profit professional association primarily dedicated to serving higher education purchasing officers in the U.S. and Canada. In 1934, members of the Association founded E&I Cooperative Purchasing, Inc. as an important undertaking and benefit of NAEP membership. Currently, over 1,000 colleges and universities are members. NAEP is a member-focused association providing progressive knowledge management in strategic sourcing, supply chain, materials and logistics for procurement professionals. NAEP provides professional development and networking opportunities regionally and nationally. These meetings, workshops, and seminars provide knowledge transfer ranging from “beginning” to “advanced” and are conducted throughout the year and across the nation. Visit [www.NAEPrnet.org](http://www.NAEPrnet.org) to learn more.

**JAGGAER: THE WORLD’S LEADING PROVIDER OF COMPREHENSIVE SOURCE-TO-PAY SOLUTIONS**

JAGGAER is the leading procure-to-pay provider in the Higher Education and Government sectors. Additionally, some of the largest Commercial, Manufacturing and Life Sciences companies in the world trust JAGGAER with billions of dollars of annual spend. JAGGAER eProcurement and strategic sourcing customers across the globe have gained access to the best suppliers, with the best terms, on our scalable, customizable, user-friendly platform. Our SaaS-based, source-to-settle solution provides unparalleled visibility, insights and recommendations to procurement leaders and suppliers. The result is a fluid supply chain driven by powerful spend analysis, comprehensive contract management and efficient accounts payable solutions. For more information visit [www.jaggaer.com](http://www.jaggaer.com).

**STONEBRIDGE VENTURES, INC.** is a leading professional services firm that works to create solutions customized to fit client needs in higher education procurement. By creating relationships that share perspectives we collaborate on strategy, then establish and execute the right implementation approach. Stonebridge cultivates partnerships that deliver flexible solutions to drive optimal value.
APPENDIX

1: RESOURCE EXAMPLES OFFERED BY YOUR COLLEAGUES

DEPARTMENTAL SCORECARD – Courtesy of the University of Colorado

![Procurement Scorecard FY2017 Q4](image)

Procurement Summary

<table>
<thead>
<tr>
<th>Fiscal Year: 2017</th>
<th>Spend Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketplace</td>
<td>$47,136,113</td>
<td></td>
</tr>
<tr>
<td>Direct AF Voucher</td>
<td>$189,100</td>
<td></td>
</tr>
<tr>
<td>Procurement Card</td>
<td>$1,001,641</td>
<td></td>
</tr>
<tr>
<td>Travel Card</td>
<td>$156,139</td>
<td></td>
</tr>
<tr>
<td>Reimbursement</td>
<td>$1,200,391</td>
<td></td>
</tr>
<tr>
<td>Airfare</td>
<td>$994,741</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>$10,215,768</td>
<td></td>
</tr>
</tbody>
</table>

Fiscal Year Spend Trend

![Fiscal Year Spend Trend Graph](image)
1: RESOURCE EXAMPLES OFFERED BY YOUR COLLEAGUES

DEPARTMENTAL SCORECARD – Courtesy of the University of Colorado

APPENDIX

DEPARTMENTAL SCORECARD – Courtesy of the University of Colorado

Purchase Order Summary

Top 10 Commodity spend

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcontracts / Sponsored Programs</td>
<td>$36,025,566</td>
</tr>
<tr>
<td>Scientific / Laboratory / Medical Equipment &amp; Supplies</td>
<td>$15,085,933</td>
</tr>
<tr>
<td>Professional Services &amp; Training</td>
<td>$1,754,898</td>
</tr>
<tr>
<td>IT Software &amp; Maintenance</td>
<td>$1,754,898</td>
</tr>
<tr>
<td>IT Hardware &amp; Maintenance</td>
<td>$1,754,898</td>
</tr>
<tr>
<td>Facilities Related Supplies, Materials &amp; Services</td>
<td>$50,185</td>
</tr>
<tr>
<td>Books, Subscriptions, &amp; Library Services</td>
<td>$50,185</td>
</tr>
</tbody>
</table>

Purchase Order Detail

Monthly Purchase Order Count and Volume

Percent of Catalog Usage

Marketplace First

Using CU Marketplace provides the following benefits:

- No procurement card expense report reconciliation
- Easy purchasing process
- Access to CU contract pricing
DEPARTMENTAL SCORECARD – Courtesy of the University of Colorado

APPENDIX

1: RESOURCE EXAMPLES OFFERED BY YOUR COLLEAGUES

DEPARTMENTAL SCORECARD – Courtesy of the University of Colorado

Managed Spend

<table>
<thead>
<tr>
<th>Supplier Name</th>
<th>FY2016 Amount</th>
<th>FY2017 Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Marketing LP</td>
<td>$455,406</td>
<td></td>
</tr>
<tr>
<td>Apple Computer Inc</td>
<td></td>
<td>$315,856</td>
</tr>
<tr>
<td>Continental Communications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Colorado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National University of Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agilent Technologies Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ArgoX USA LLC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$1,249,388</td>
<td></td>
</tr>
</tbody>
</table>

Spend Under Management Monthly Comparison

Airfare Summary

<table>
<thead>
<tr>
<th>Airfare Totals</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Airfare Tickets</td>
<td>$1,249,388</td>
</tr>
<tr>
<td>Domestic</td>
<td>$335,503</td>
</tr>
<tr>
<td>International</td>
<td>$503,845</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$840,324</td>
</tr>
</tbody>
</table>

Advanced Booking Details

<table>
<thead>
<tr>
<th>Advanced Days Booking</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>$37,119</td>
</tr>
<tr>
<td>3-4</td>
<td>$30,363</td>
</tr>
<tr>
<td>7-10</td>
<td>$58,386</td>
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<tr>
<td>10-20</td>
<td>$81,051</td>
</tr>
<tr>
<td>30+</td>
<td>$160,090</td>
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<tr>
<td>Grand Total</td>
<td>$412,504</td>
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</table>

Average Ticket Price Comparison

<table>
<thead>
<tr>
<th>Airfare Totals</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>$409,847</td>
</tr>
<tr>
<td>International</td>
<td>$503,845</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$913,692</td>
</tr>
</tbody>
</table>

Airfare Booking Methods

<table>
<thead>
<tr>
<th>Booking Method</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booking w/Agent</td>
<td>$409,847</td>
</tr>
<tr>
<td>Booking w/o Agent</td>
<td>$503,845</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$913,692</td>
</tr>
</tbody>
</table>

Adoption Rate

- Department: 70.2%
- Campus Wide: 66.2%
- University Wide: 66.1%
SPEND BY GEOGRAPHIC LOCATION (EXAMPLE) – Courtesy of George Washington University
APPENDIX

1: RESOURCE EXAMPLES OFFERED BY YOUR COLLEAGUES

DIVERSITY SPEND (EXAMPLE) – Courtesy of George Washington University
TRAVEL SPEND (EXAMPLE) – Courtesy of George Washington University
<table>
<thead>
<tr>
<th>Rank</th>
<th>BI Trend</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Collaboration</td>
<td>9.5</td>
</tr>
<tr>
<td>2</td>
<td>Data Storytelling</td>
<td>9.4</td>
</tr>
<tr>
<td>3</td>
<td>Master data / data quality management</td>
<td>9.2</td>
</tr>
<tr>
<td>4</td>
<td>Data discovery / visualization</td>
<td>8.5</td>
</tr>
<tr>
<td>5</td>
<td>Data governance</td>
<td>8.3</td>
</tr>
<tr>
<td>6</td>
<td>Data preparation for business users</td>
<td>8.2</td>
</tr>
<tr>
<td>7</td>
<td>Big Data Analytics</td>
<td>7.8</td>
</tr>
<tr>
<td>7</td>
<td>Integrated Platforms</td>
<td>7.8</td>
</tr>
<tr>
<td>7</td>
<td>Visual design standards</td>
<td>7.8</td>
</tr>
<tr>
<td>10</td>
<td>Agile BI development</td>
<td>7.5</td>
</tr>
<tr>
<td>11</td>
<td>Data warehouse modernization</td>
<td>7.3</td>
</tr>
<tr>
<td>11</td>
<td>Real-time analytics</td>
<td>7.3</td>
</tr>
<tr>
<td>13</td>
<td>Self-service BI</td>
<td>7.2</td>
</tr>
<tr>
<td>14</td>
<td>Using external / open data</td>
<td>7.1</td>
</tr>
<tr>
<td>15</td>
<td>Predictive analytics</td>
<td>6.9</td>
</tr>
<tr>
<td>15</td>
<td>Embedded BI</td>
<td>6.9</td>
</tr>
<tr>
<td>17</td>
<td>Cloud BI</td>
<td>6.8</td>
</tr>
<tr>
<td>18</td>
<td>Data Science</td>
<td>6.6</td>
</tr>
<tr>
<td>19</td>
<td>Spatial / location intelligence</td>
<td>6.5</td>
</tr>
<tr>
<td>20</td>
<td>Mobile BI</td>
<td>6.4</td>
</tr>
</tbody>
</table>

BUSINESS INTELLIGENCE TREND DESCRIPTIONS (Source: Bi Trend Monitor 2018 – The World's Largest Survey on BI Trends, BARC Research Study (see Appendix 3, reading #3))

1. **Collaboration:** Collaboration is an important, but not a new trend in business intelligence. Different collaboration features are available for a variety of BI use cases. First of all, almost everyone sees functionality such as commenting, chats and threads as classic collaboration characteristics. In the area of planning and budgeting, workflows are an important collaboration component.

2. **Data Storytelling:** Data relies on you to give it a voice. Data storytelling has emerged as a sophisticated method to explain the meaning of data and insights gained from analytics to foster action in the right direction. Data stories supplement and usually build on components of standardized reports and dashboards (e.g. graphs and tables).

3. **Master Data / Data Quality Management:** The importance of data quality and master data management can be explained very simply: people can only make the right decisions based on accurate data. Through their aggregation mechanisms, BI reports and analyses can help reveal data quality issues. Operational and decision-making processes also profit from high data quality.
4. **Data Discovery / Visualization**: Data discovery is the business user driven and iterative process of discovering patterns and outliers in data. To efficiently and effectively identify and evaluate patterns and outliers, modern data discovery has to cover three functional areas in a tightly integrated manner to support iterative analytics.

5. **Data Governance**: Data governance focuses on the data in analytics and operational systems. Data governance is essential for data-driven companies that are extending existing BI investments with exploratory and operational analytics. Governance must go beyond classic BI systems and, from a data perspective, incorporate operational systems.

6. **Data Preparation for Business Users**: In today’s economy, achieving efficient and agile data preparation is of utmost importance. Many companies today view data preparation as the key to increasing their ability to efficiently use data in a distributed manner to optimize business processes, or to enabling new, innovative business models in the first place. Data preparation is the iterative process of cleaning, structuring and enriching raw data or diverse data sources for use in explorative analytics.

7. **Big Data Analytics**: Big data analytics is a strategic initiative and seeks to use various internal, and increasingly external, data sources and data types for competitive advantage. There is widespread interest in capturing and drawing insights from data streaming from the Internet of Things, as well as social media, mobile devices and enterprise applications.

8. **Integrated Platforms**: Integrated functionality for BI and performance management (particularly planning) in one common platform has been one of the most stable and relevant trends in the market for years. Many companies and users know that there can be no planning without supporting functionality for reporting (e.g. results reports), analysis (e.g. analyses of planned and actual values) and dashboarding (monitoring). The seamless integration of planning and BI functionality is essential to support planning processes optimally.

9. **Visual Design Standards**: “Visual design standards” describes the practice of presenting relevant information in a way that it can be understood in an effective and efficient manner. This involves the deployment of a common ‘visual language’ (usually called notation guideline) for reports, dashboards and presentations throughout a department or organization with established formatting rules and design standards.

10. **Agile BI Development**: The term “agile” has increasingly been adopted in the context of business intelligence in recent years. Originally referring to a software development methodology, the “agile” moniker is now often used as a requirement for the development of new data models, reports, dashboards or visualizations. Arguably, most users requesting “agile BI” have very little understanding of the agile development methodology and use the term as a synonym for “flexible”, indicating a pressing need for faster development cycles.

11. **Data Warehouse Modernization**: New analytical challenges, increasing data variety, rising data volumes, faster decision processes, process automation and decreasing hardware costs are all having major effects on how companies store their data. Firstly, older data warehouse landscapes have become too complex to support agile development, or too expensive to have their functionality extended to accommodate modern analytics requirements. Furthermore, the type of implementation for which many data warehouse landscapes were originally designed and optimized does not cover the way analytics is currently moving forward in the direction of exploration and operational processing alongside classical BI requirements.

12. **Real-time Analytics**: BI with real-time data refers to the near-immediate processing and provision of information about business operations in transactional systems (i.e. streaming) Real-time analytics is about catching events or other new data immediately after their occurrence and processing them for display.
13. **Self-Service BI**: Departmental users require data to be accessible anytime, anywhere and on any device, and new analyses and reports have to be provided at short notice. This is increasing the pressure on IT and BI organizations by showing that traditional development methods are simply not suitable for many use cases.

14. **Using External / Open Data**: It is no secret that data is growing in importance to companies. Expectations around data and analysis are also growing and, with that, awareness of the value of data is heightened. Whether it is used for optimizing existing processes or as a basis for innovative, new business ideas, data is available in a variety of formats from internal and external sources.

15. **Predictive Analytics**: Predictive analytics and data mining are important trends among BI decision-makers for 2018. Advanced analytics goes beyond mathematical calculations such as sums and averages. It uses mathematical and statistical formulas and algorithms in order to generate new information, identify patterns and dependencies, and calculate forecasts.

16. **Embedded BI**: Embedding intelligence in operational applications is growing steadily in popularity. From dashboards to prediction and optimization models, users can access complementary functions directly in their specific operational processes and act on the findings – closing the classic management loop from information to action.

17. **Cloud BI**: The global trend of running applications in a cloud environment started to branch out into the business intelligence and analytics domain about ten years ago. Start-ups were founded to disrupt the established BI vendors with the software-as-a-service business model, by which organizations source their reports and dashboards from a hosted infrastructure.

18. **Data Science**: Data science is the generic term for processes that generate knowledge out of data using methods from statistics, machine learning and operations research.

19. **Spatial / Location Intelligence**: Spatial/location intelligence has been around for a long time, albeit as something of a niche area, often performed using specialist tools that have little or no integration with reporting, dashboarding and analysis solutions. Given that almost every data set includes some kind of geographical information (e.g. city, zip code, longitude, latitude), this approach seems rather shortsighted. However, with the recent trend for visualization and data discovery, there is a renewed demand for geo-visualization and analysis, whereby solutions that represent data in a visual manner are able to plot data on maps or other objects to provide additional insights.

20. **Mobile BI**: the most successful mobile deployments are those in which a mobile strategy has already been devised and the needs of mobile workers are carefully addressed with the BI tool. So, for example, simply copying an existing (web) dashboard to a mobile environment is not always a successful approach. There is great potential for mobile BI to support operational processes while simultaneously increasing the penetration of BI within organizations.
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2. “Business Intelligence”

3. Business Intelligence (BI), Margaret Rouse, SearchBusinessAnalytics.com
   http://searchbusinessanalytics.techtarget.com/definition/business-intelligence-BI

4. Business intelligence vs. business analytics: Where BI fits into your data strategy, Mary Pratt, Contributing Writer, CIO, 
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5. Business Intelligence Skills, Business Intelligence Skills for Resumes, Cover Letters, and Interviews, By Alison Doyle, 
   Updated August 21st, 2017
   https://www.thebalance.com/business-intelligence-skills-2062364

6. 7 keys to a successful business intelligence strategy, Mary Pratt, Contributing Writer, CIO, Sept 26th, 2017

7. 9 ways you’re failing at business intelligence, Bruce Harpham, CIO, Nov 21st, 2017