INTRODUCTION TO BUSINESS INTELLIGENCE

Business Intelligence (BI) uses methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making. Identifying opportunities and implementing effective strategies can provide a competitive advantage and long-term stability for American University.

BI@AU: MICROSTRATEGY REPORTING AND ANALYSIS

American University uses the MicroStrategy reporting platform to provide information, analyze trends, create scorecards and dashboards, and proactively deliver timely information to users within the organization.

- Executive Dashboards
- Performance Dashboards
- Budget and Financial Management (General Ledger) Reports
    - Research Grants Reports
    - Office of Sponsored Projects Reports
- Graduate and Undergraduate Admissions Reports
- Development and Alumni Relations Reports
- Student Enrollment and Retention

MicroStrategy reporting uses a browser-independent web interface that includes features like:

- *Sorting and filtering*
- *Drag and Drop Report Manipulation*
- *Drop down menus*
- *Right click, context sensitive menus*
- *One-click toolbars*

BI@AU: USER GROUPS

There are two defined Business Intelligence User Groups at American University.

BI Web Reporter (Information Consumers):

- Use interactive reports or key performance indicator dashboards without changing the report structure or content.
- Tailor interactive reports to their or someone else's needs by manipulating (including filtering content) and distributing existing reports.

BI Web Analysts (Information Creation):

- Create and manipulating new reports based on available data elements loaded from Colleague and other sources.
- Save and share newly created reports.

DATA

1. Source Systems (Colleague, recruit, etc.)

Source systems store the data that is captured about the University and it's operations. These systems may be databases or mainframes, but they are optimized to process the recording of data. The Ellucian Colleague system is the primary data source for BI Reporting at American University.

2. Extract, Transformation, and load

Data is pulled from the source system(s) on a nightly basis to load into our reporting database. After being extracted, we also transform data from Colleague and other data sources to create additional information such as a student's Primary Academic Program or Retention Cohort.

3. Enterprise Data Warehouse

The extracted/transformed data is then loaded into the Enterprise Data Warehouse (EDW). This database holds all of the information available for BI reporting. This separate database allows IT to optimize it for reporting on larger data sets and isolates the impact of reporting on these larger data sets from the source operational systems.

ACCESS TO BI

Access to Business Intelligence is determined by business need. All account or access requests should be submitted to the OIT Help Desk. Users should specify the reporting domain being requested as well as the school/university department to which he/she belongs. The OIT Help Desk will forward the request to the appropriate Data Custodian for approval. Once approved, the account is created and credentials are granted once this mandatory training is completed. Additional training is available depending on your access level.

RESPONSIBLE COMPUTING

Everyone with access to American University data shares in the responsibility to protect and defend our academic, administrative, and financial information resources. American University adheres to the Principle of Least Privilege which provides the narrowest access needed to sensitive data to reduce risk to the university. American University Office of Information Technology offers extensive online training in Information Security Best Practices, and you are encouraged to email CIO@american.edu if you have any questions or concerns.

BUSINESS INTELLIGENCE TERMINOLOGY

Reports

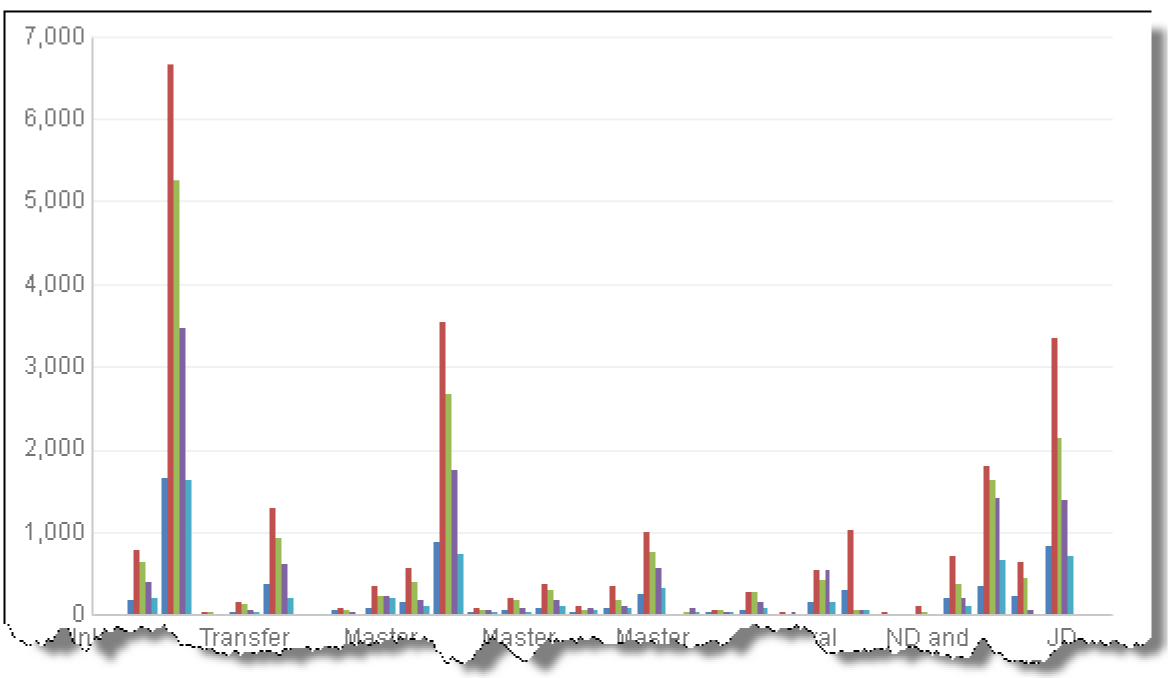
A report is a request for specific data that has a defined layout and format.

All of the information for a report can be predefined or you may be able to choose part or all of the content of a report. You can view report results either in grid or graph format. The following image shows an example of a grid report:

The following image shows a **grid** report:

Admit Category	Application Degree	Five Year Prior Term	2012F	2013F	2014F	2015F	2016F
Unknown	ALUM	Alumni Audit		4			
New Freshman	BA	Bachelor of Arts	166	780	639	398	194
	BACH	Bachelor's	1,645	6,644	5,241	3,466	1,621
	BS	Bachelor of Science	7	32	21	14	1
	BA	Bachelor of Art	40	[illegible]	[illegible]	60	25

This image shows the same data as above displayed in a **graph** report:



Report Elements -

Row and Column

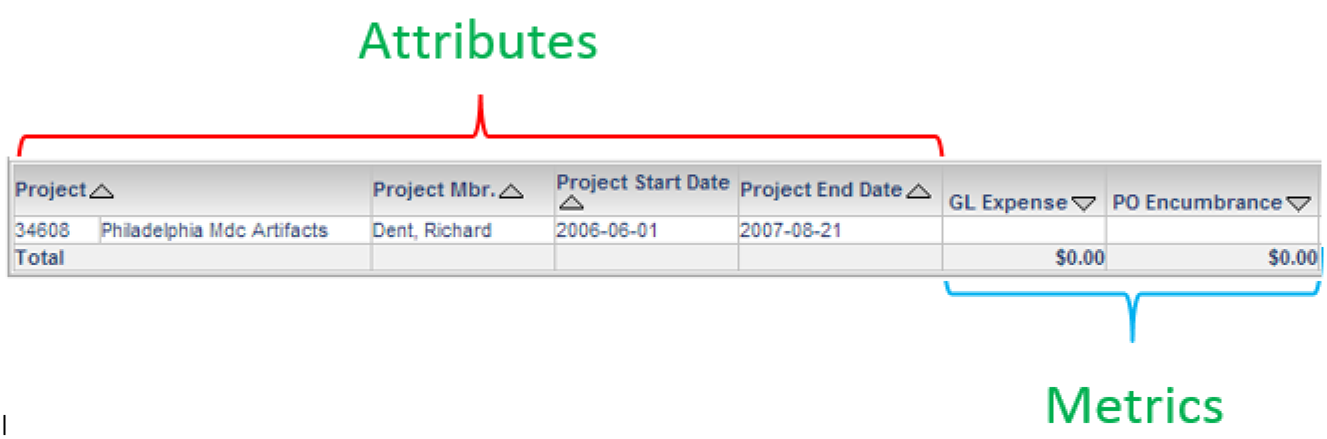
On a typical report, each **row** represents groupings by the values of different concepts, such Student, Course Section Name, GL Unit, and so on. MicroStrategy calls these concepts "**attributes**," because represent the many important characteristics of the university. While the rows represent concepts/groupings, the **columns** of a typical report represent calculations, such as Enrolled Credits or GL Amount. MicroStrategy calls these calculations "**metrics**."
It can be useful to think of attributes as the nouns and metrics as the verbs. A student enrolls in a course section. A Project incurs an expense.

Attribute

Attributes are the concepts/characteristics reflected in your stored data in your data source. **Attributes** provide a context in which to report on and analyze calculations.

Metric

Metrics are MicroStrategy objects that represent counts, measurements, and key performance indicators. From a practical perspective, **metrics** are the calculations performed on data stored in your database, the results of which are displayed on a report. **Metrics** are similar to formulas in spreadsheet software.



Project		Project Mbr.	Project Start Date	Project End Date	GL Expense	PO Encumbrance
34608	Philadelphia Mdc Artifacts	Dent, Richard	2006-06-01	2007-08-21		
Total					$0.00	$0.00

Filter

A **filter** is the part of a MicroStrategy report that screens data from the EDW to determine whether the data should be included in or excluded from the calculations of the report results. Filters are helpful in clarifying large quantities of data and only displaying subsets of that data, so reports show users what they really need to see.

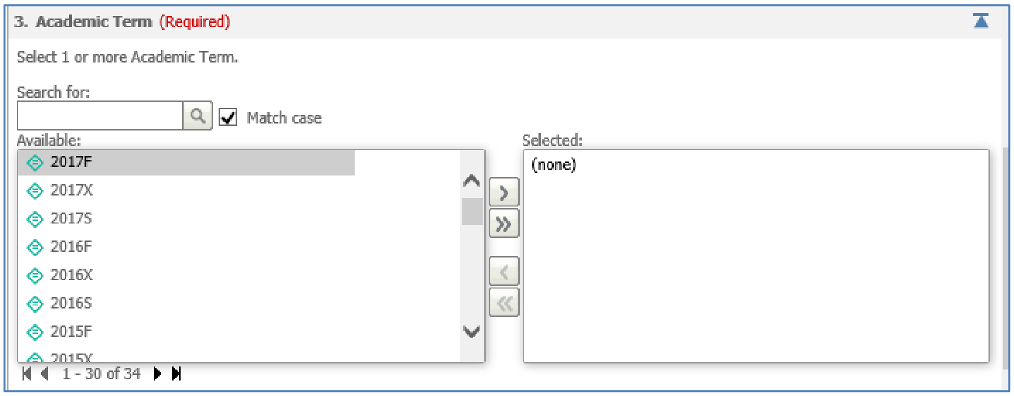
For example, you want to view the *GL Expense* and *PO Encumbrance* amounts for *Project 34608* in *Fiscal Year 2017*. The report would need to be filtered by GL Project = 34608 and Fiscal Year = 2017.

Prompts

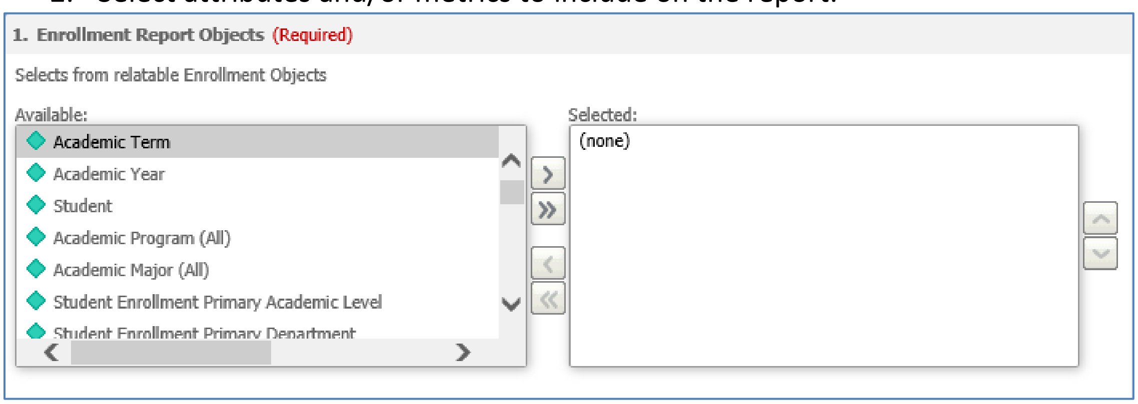
A **prompt** is a question the system presents to a user during report execution. How the user answers the question determines what data is displayed on the report when it is returned from your data source. Prompts may be used to create filters on a report, determine what attributes and metrics appear on a report, and/or both. Instructions for a given prompt will appear below the prompt title and will explain the effects of your selections. You may either click on the desired value and then the right pointing arrow or double-click your selection to add it to the Selected list. Required prompts are indicated by the word (Required) and must be answered before the report will run. Optional prompts may be left blank.

Examples:

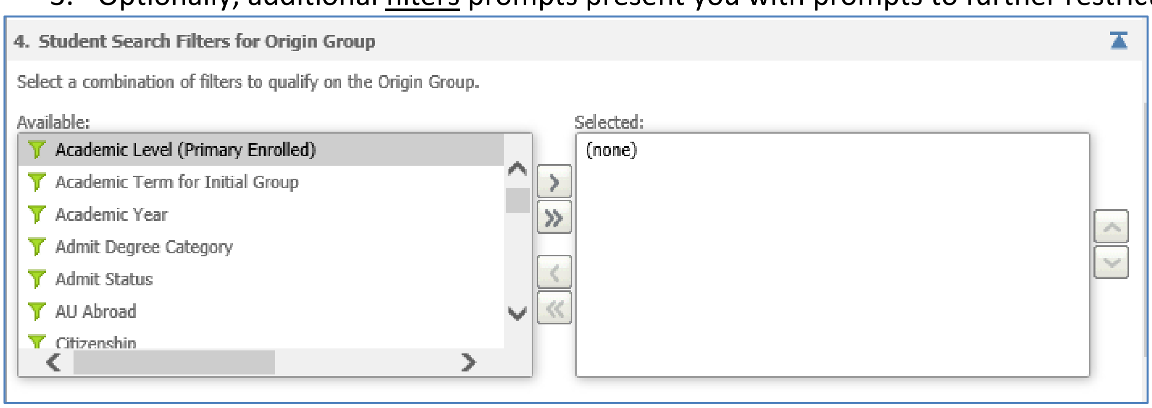
1. Select a value to filter report. A common report element prompt is the **Academic Term**.



2. Select attributes and/or metrics to include on the report.



3. Optionally, additional filters prompts present you with prompts to further restrict the report.



REPORT TYPES

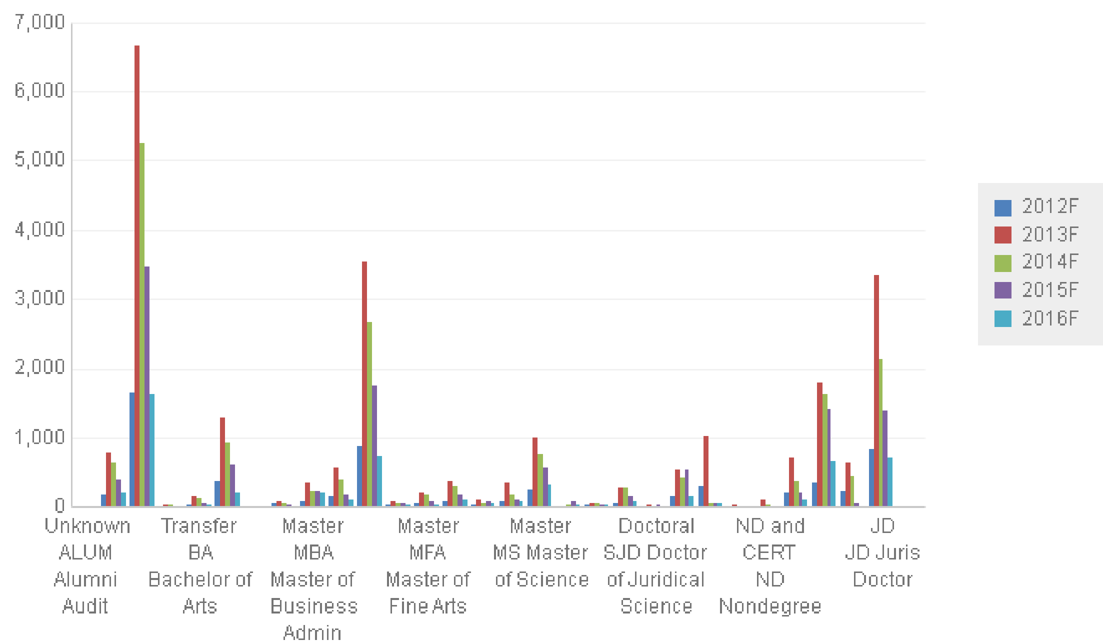
Grids

A **grid** report is the most commonly used type of report. **Grid View** displays grid reports using a formatted, cross-tabular display of the report data. Most business intelligence analysis is performed using this view. The following figure displays the Grid View of a report.

Admit Category	Application Degree	Five Year Prior Term	2012F	2013F	2014F	2015F	2016F
Unknown	ALUM	Alumni Audit		4			
New Freshman	BA	Bachelor of Arts	166	780	639	398	194
	BACH	Bachelor's	1,645	6,644	5,241	3,466	1,621
	BS	Bachelor of Science	7	32	21	14	1
	BA	Bachelor of Art[illegible]	40	[illegible]	[illegible]	60	25

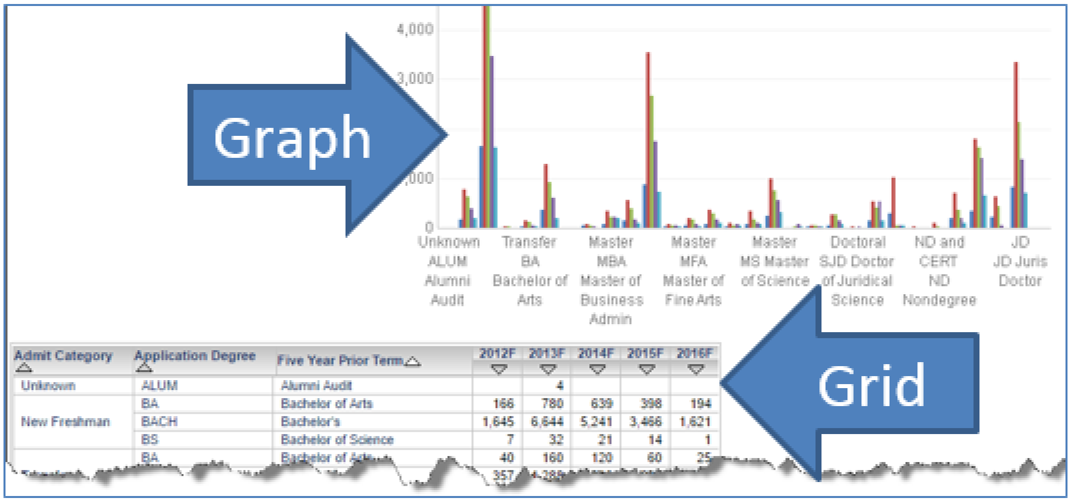
Graphs

A **graph** report is representations of data in a visual format that can help you see overall trends easily, identify medians and exceptions, and so on. You display report data as a graph using **Graph View**. There are many different graph styles you can choose from to display your report data most effectively.



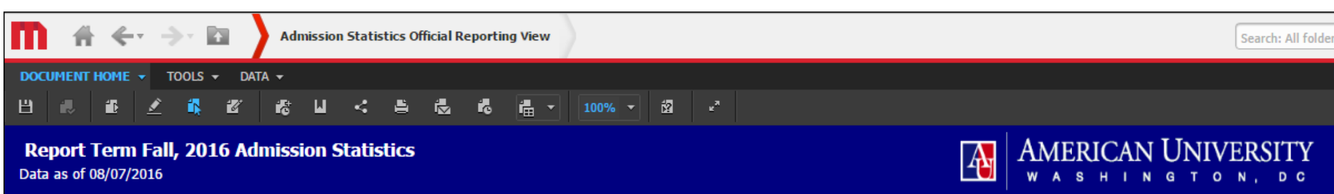
Grids and Graphs combined

Grid Graph View is a combination display of the **Grid View** and the **Graph View** of a report, side by side. The following figure displays the **Grid Graph View** of a report.



Document

A **document** is a more formatted report that may contain information from multiple grids. There is less interaction but the report results will be formatted in such a way to make it easier to print. A document may include several tabs.

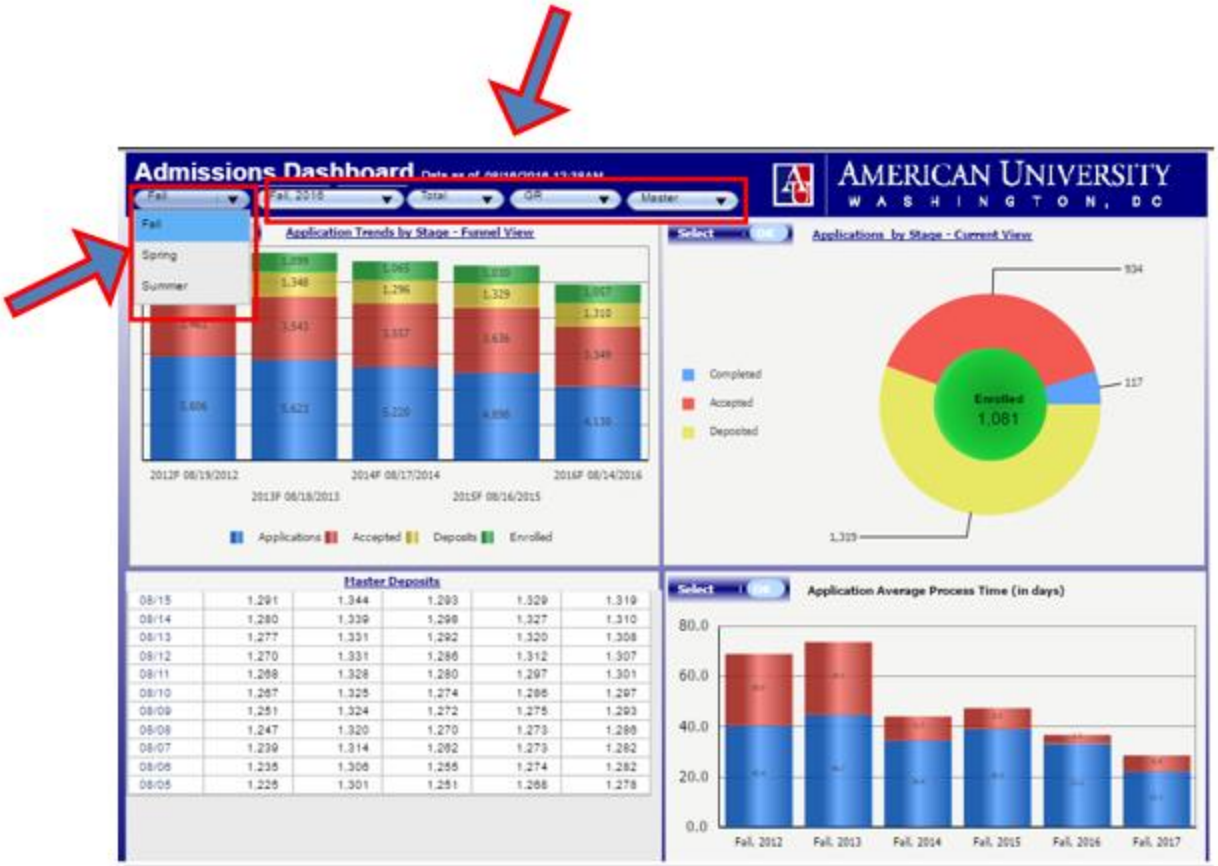


Report Term Fall, 2016 Admission Statistics
Data as of 08/07/2016

		Applications			Admits			Deposited			Enrolled			Enrolled Other		
		Fall, 2015 08/16/2015	Fall, 2016 08/07/2016	% Change	Fall, 2015 08/16/2015	Fall, 2016 08/07/2016	% Change	Fall, 2015 08/16/2015	Fall, 2016 08/07/2016	% Change	Fall, 2015 08/16/2015	Fall, 2016 08/07/2016	% Change	Fall, 2015 08/16/2015	Fall, 2016 08/07/2016	% Change
New Freshman	CAS	7,053	8,640	22.5%	1,846	1,519	(17.7%)	482	470	(2.5%)	379	358	(5.5%)	40	27	(32.5%)
	KOGOD	2,437	2,909	19.4%	633	528	(16.6%)	189	188	(0.5%)	170	171	0.6%	30	41	36.7%
	SIS	2,969	2,994	0.8%	1,677	1,519	(9.4%)	586	503	(14.2%)	526	474	(9.9%)	38	64	68.4%
	SOC	1,651	1,818	10.1%	589	487	(17.3%)	191	181	(5.2%)	168	158	(6.0%)	35	26	(25.7%)
	SPA	2,627	2,972	13.1%	1,125	956	(15.0%)	394	373	(5.3%)	333	309	(7.2%)	55	56	1.8%
	SPEXS	0	0		0	0		0	0		0	0		0	1	
	Total	16,737	19,333	15.5%	5,870	5,009	(14.7%)	1,842	1,715	(6.9%)	1,576	1,470	(6.7%)	198	215	8.6%
Transfer	CAS	620	551	(11.1%)	388	302	(22.2%)	108	83	(23.1%)	61	60	(1.6%)	4	0	(100.0%)
	KOGOD	305	299	(2.0%)	166	169	1.8%	58	47	(19.0%)	42	35	(16.7%)	4	5	25.0%
	SIS	230	190	(17.4%)	166	129	(22.3%)	56	29	(48.2%)	36	24	(33.3%)	3	1	(66.7%)
	SOC	170	161	(5.3%)	98	90	(8.2%)	27	21	(22.2%)	19	13	(31.6%)	4	1	(75.0%)
	SPA	228	221	(3.1%)	155	123	(20.6%)	48	25	(47.9%)	23	13	(43.5%)	2	2	0.0%
	Total	1,553	1,422	(8.4%)	973	813	(16.4%)	297	205	(31.0%)	181	145	(19.9%)	17	9	(47.1%)
	CAS	391	404	3.3%	274	286	4.4%	195	195	0.0%	45	35	(22.2%)	0	1	

Dashboard

A **dashboard** is an interactive report that may combine information from multiple grids and graphs. It is highly visual and is usually best viewed on-line. A dashboard may also include multiple tabs.



MICROSTRATEGY BI REPORTS

Overview:

- Navigate to the folder that contains the report you want to run.
- Click the name of the report to run the report.
- If the **Wait Page** appears as your report is executing, you can click **Add to my History List** to automatically save a copy of the report in your History List when the report is finished executing.
- If you are presented with a prompt question, you must answer the prompt(s) before the results of the report are displayed.
- After the report is displayed, you can interact with the report to change the sorting, filter the view, or change the display.

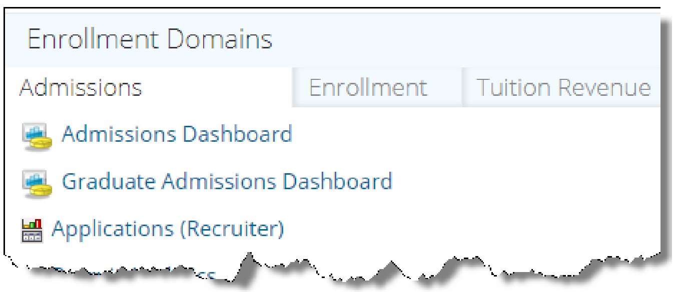
Technical Requirements:

- Recommended Web browsers:
  - Firefox
  - Chrome

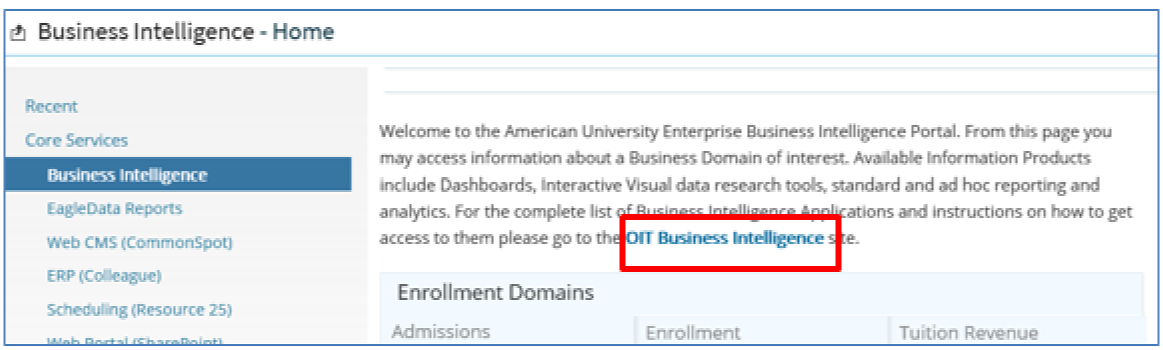
Accessing MicroStrategy BI Reporting

1. Log on to the **myau.american.edu Portal**, then expand the **TECHNOLOGY** link under **Personalized links**.
2. Select **Business Intelligence**. Access to view this link is restricted to those granted the security class. Contact the HelpDesk at x2550 for security class assistance.

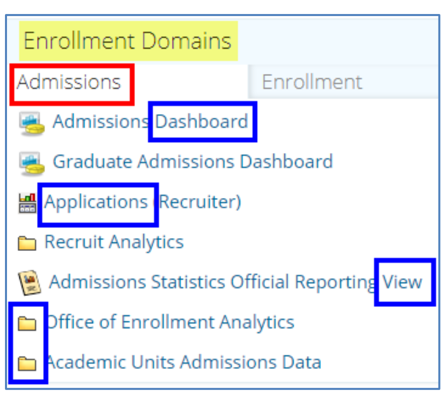
3. The **BI Portal** will be customized based on the domains to which you have been granted access.



4. If you would like to see a complete list of applications and instructions for access, click the **OIT Business Intelligence link** at the top of the page, in the last sentence of the first paragraph.



5. The available reporting applications have been organized by domain: **Enrollment**, **Finance and Administration**, **Development and Alumni Relations**, and **Office of Information Technology**. Click on the tab under the appropriate domain to access reports and folders.
6. Make a selection from your available options: **dashboard**, **document**, **folder**, etc.

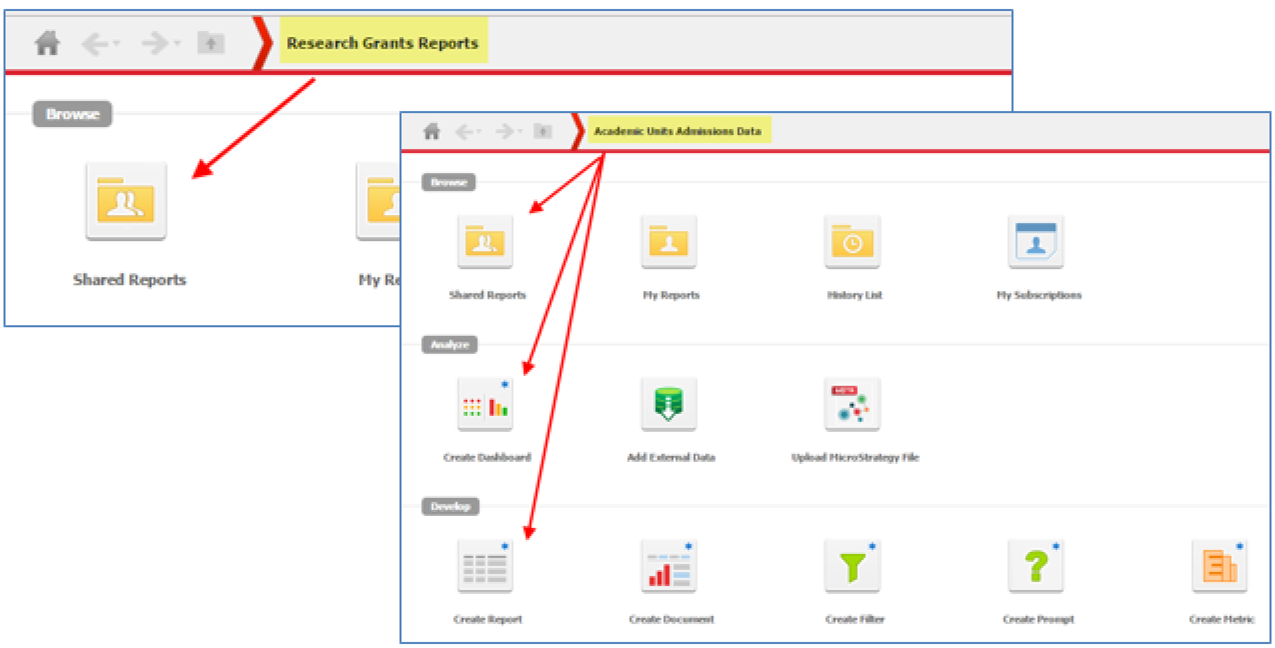


ACCESS RIGHTS AND PRIVILEGES

IDENTIFYING ACCESS RIGHTS

The folders, reports, and features you can access depend on the rights and privileges that have been granted to your account. You may have rights to access the **Research Grants and Reporting** Shared Reports folder but your privileges do not extend to running the **Overhead and Fringe** reports. Some users will have rights to create new reports while others will only be able to run existing reports.

- **PRIVILEGES** – control what functionality in the MicroStrategy system the user has access to (i.e. run reports vs. create your own)
- **SECURITY FILTERS** – control what data the user has access to (i.e. user may only access GL accounts to which the user has been granted access to in Colleague within the Budget and Financial Management reporting.)
- **PERMISSIONS** – control to which objects (Attributes, Metrics, etc.) in the MicroStrategy system the user has access:
  - None (user may not run a report including that object)
  - Execute (user may run reports using these object)
  - Full Control (user may change these objects)).

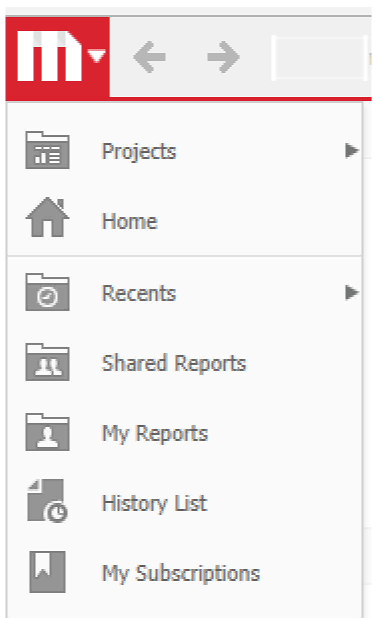


REPORTS

Through Enterprise Reporting, you can analyze data using standard features such as page-by, pivot, sort, filter and drill up/down to flip through a series of report views. Massive amounts of operational data are organized into hierarchical categories that are fundamental to university operations. The reports feature easy page and section navigation, including labels, headers, footer and page break logic.

Each project that you log into in **BI** opens the project's **HOME** page, which provides links at the top of the page to different areas of the project. Click the **Microstrategy logo** to select from:

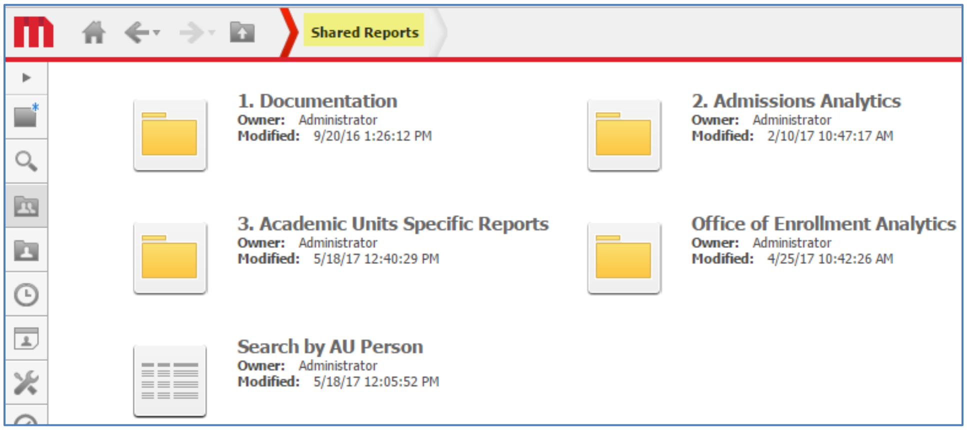
- **PROJECTS** - all the domain folders you have rights to access
- **RECENTS** - access any reports you have recently run within a particular BI application
- **SHARED REPORTS** - a common report library for all users
- **MY REPORTS** - each users' favorite reports
- **HISTORY LIST** - stored reports that have been run on a schedule and delivered to the History List folder
- **MY SUBSCRIPTIONS** - a list of scheduled reports, where you can manage subscriptions to scheduled reports



Shared Reports Folder

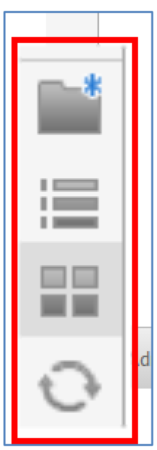
Selecting **Shared Reports** displays subfolders containing reports. Below each subfolder name is a description of the types of reports contained in the subfolder. ***Note***: If you know the name of the report you are looking for and not the exact location, you may also use the search feature by either clicking the magnifying glass from the **NAVIGATION TOOLBAR** on the left or entering the name in the search box in the upper right of the Shared Reports page.

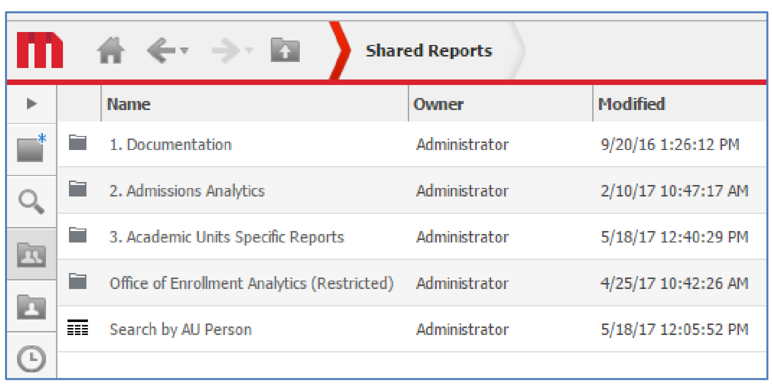
1. Click the name of a **subfolder** to display a list of the **reports**.



Navigation Tree, List, Icon views

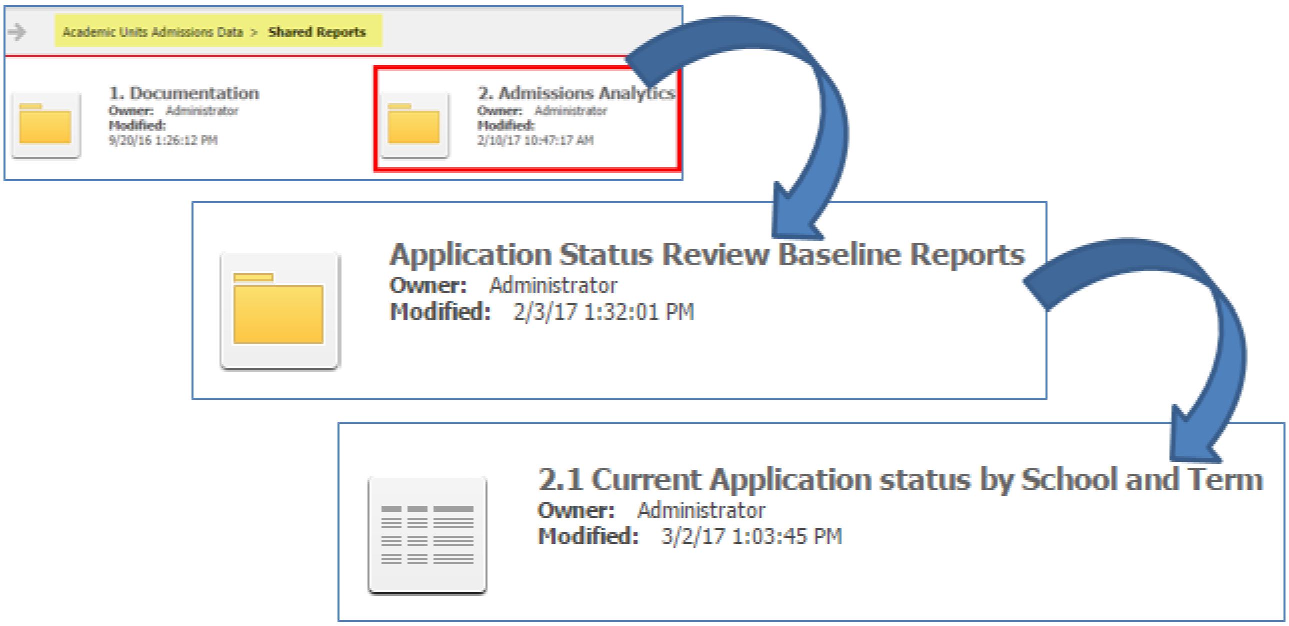
1. To change the report list display, make a selection from the **NAVIGATION TOOLBAR**, located at the bottom of the left sidebar. Choose one of the following:
    - ***Show Navigation Tree***
    - ***List***
    - ***Icon***





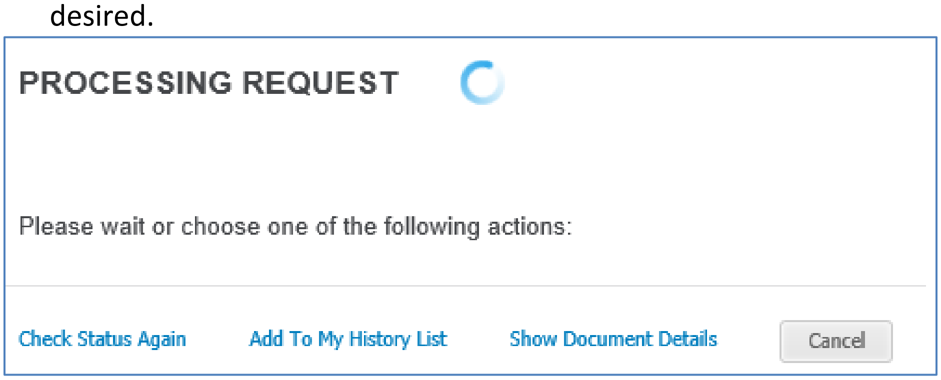
Run a Report

1. To run a report, click the report name. For this example, select the **2. Admissions Analytics** folder, then click **Application Status Review Baseline Reports** subfolder, and, then, click the **2.1 Current Application status by School and Term** report.

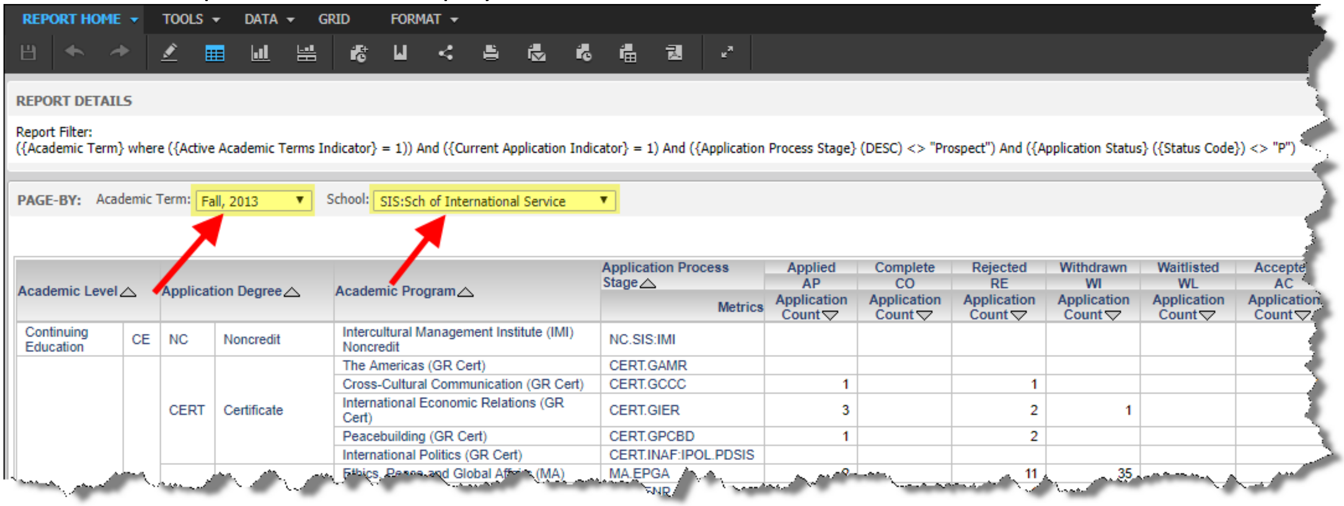


2. Click the **RUN REPORT** button located in the lower left corner of the screen to run the report.

3. If the report does not return immediately, a **PROCESSING REQUEST** page will appear. After refreshing the first time, a link will appear and the running report can be added to the history list to be viewed later. After adding a report to the history list, the user may then navigate away and run other reports if desired.



4. After the report is run, it is displayed on the next screen.



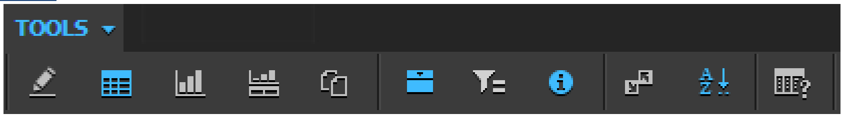
Using the Toolbars

1. To interact with the data, use the **MENUBAR** and/or **TOOLBAR** located above the report display.
2. Do one of the following:
   - Select the dropdown next to the **MENUBAR** name and choose an option.
   - Click the **MENUBAR** name to change the **TOOLBAR** and then select an option from the **TOOLBAR**.

Home:

- Grid
- Graph
- Grid and Graph
- Add to History List
- Create Personal View
- Share
- Print
- Send Now
- Schedule to History List
- Export
- PDF
- Full Screen Mode

Tools:

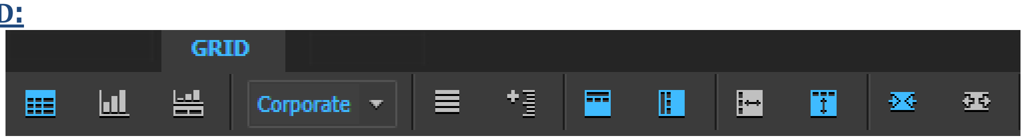


- Grid
- Graph
- Grid and Graph
- Related Reports
- Page-by Axis
- View Filter
- Report Details
- Show Pivot Buttons
- Show Sort Buttons
- Report Options

Data:

- Grid
- Graph
- Grid and Graph
- Add View Filter Condition
- Sort
- Drill
- Filter on Selections
- Hide Nulls/Zeros
- Refresh
- Swap Rows and Columns

Grid:



- Grid
- Graph
- Grid and Graph
- Autostyles
- Banding
- Outline
- Merge Column Headers
- Merge Row Headers
- Lock Row Headers
- Lock Column Headers
- Autofit to Contents
- Autofit to Window

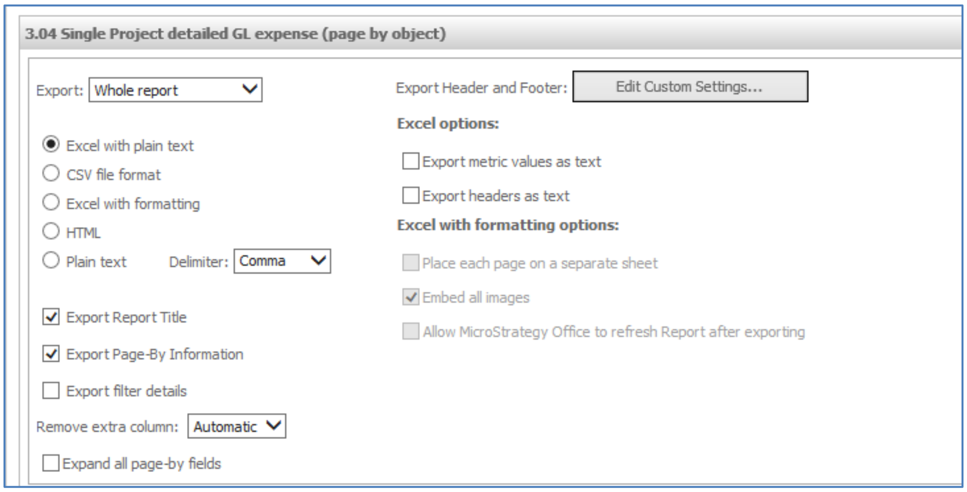
MOUSEOVERS

MicroStrategy **BI** provides more information regarding icons and report elements through the use of mouseovers. Hover your mouse pointer over an icon or an attribute/metric name on a report and a short description will pop up if one has been created.

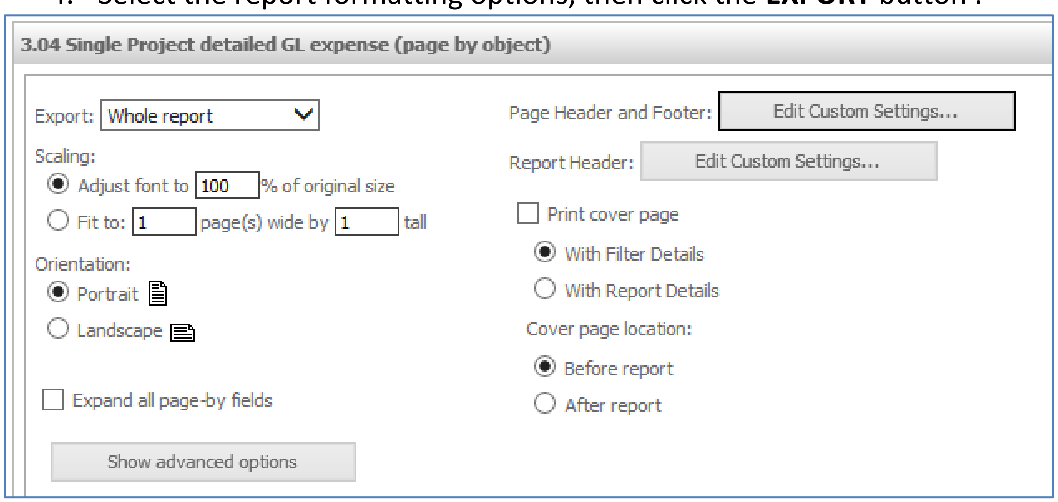
PRINTING AND EXPORTING DATA

MicroStrategy **BI** allows you to easily export reports to **Microsoft Excel** and as an **Adobe PDF file**.

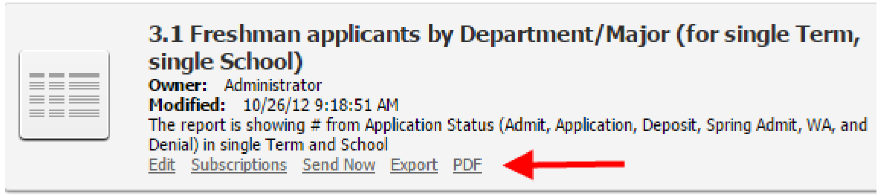
1. To export the report to Excel, click the **EXPORT TO EXCEL** button on the **Home Menu** toolbar.
2. Select the report formatting options, then, click the **EXPORT** button .



3. To export the report to a PDF, click the **EXPORT TO PDF** button on the **Home Menu** toolbar . You can also click the **PRINTER** icon which displays the same **Options dialog box** as the **PDF icon**.
4. Select the report formatting options, then click the **EXPORT** button .



5. You can also choose to run the report directly into a **PDF** or **Excel** by selecting these options under the report description.



FILTER DATA SHOWN

MicroStrategy **BI** provides a few ways in which you can limit what data is shown on the screen for a report.

1. A report may already have included **PAGE-BY** fields or you can add them yourself. If there are no fields in the **PAGE-BY** section, you can enable it by clicking on the Page-By option under TOOLS. Any attributes can be pulled into the **PAGE-BY** section. Select an attribute value from the list and only rows with those values will be shown on the screen.

2. You can also add a **VIEW FILTER** to the report. Click on the **VIEW FILTER** option on the **TOOLS** menu. Select one of the report elements from the drop-down presented. You can then build your filter on values of those report elements. Remember to click **Apply** to restrict your view of the report. You can add multiple view filters to one report. Click **Clear All** in the **VIEW FILTER** section to remove all view filters.

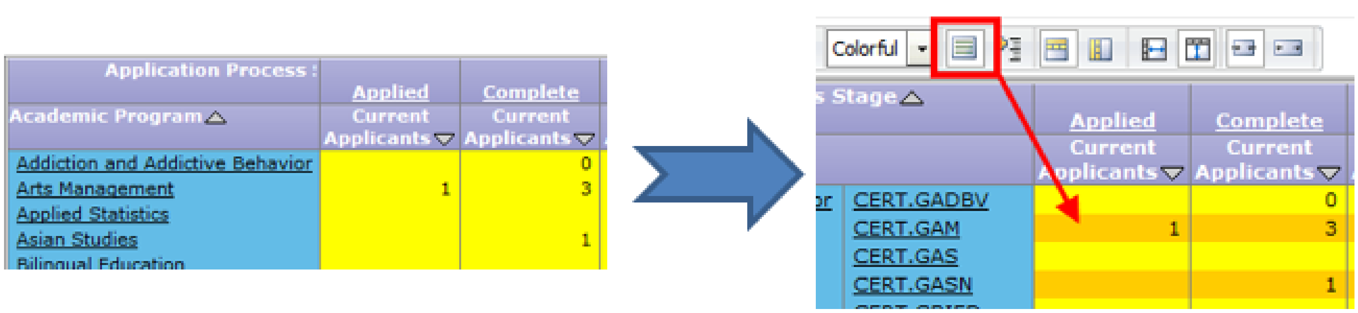
SORT THE DATA

MicroStrategy **BI** provides the ability to change the way that a report is sorted in your display.

1. From the **TOOLS** menu, select **Show Sort Buttons** to add sort buttons to the report elements. You can click them to sort by that value up or down.
2. From the **DATA** menu, select the **Sort** option to sort by one or more different report elements.

VISUALIZE THE DATA

MicroStrategy BI provides the ability to change the way that a report is displayed.



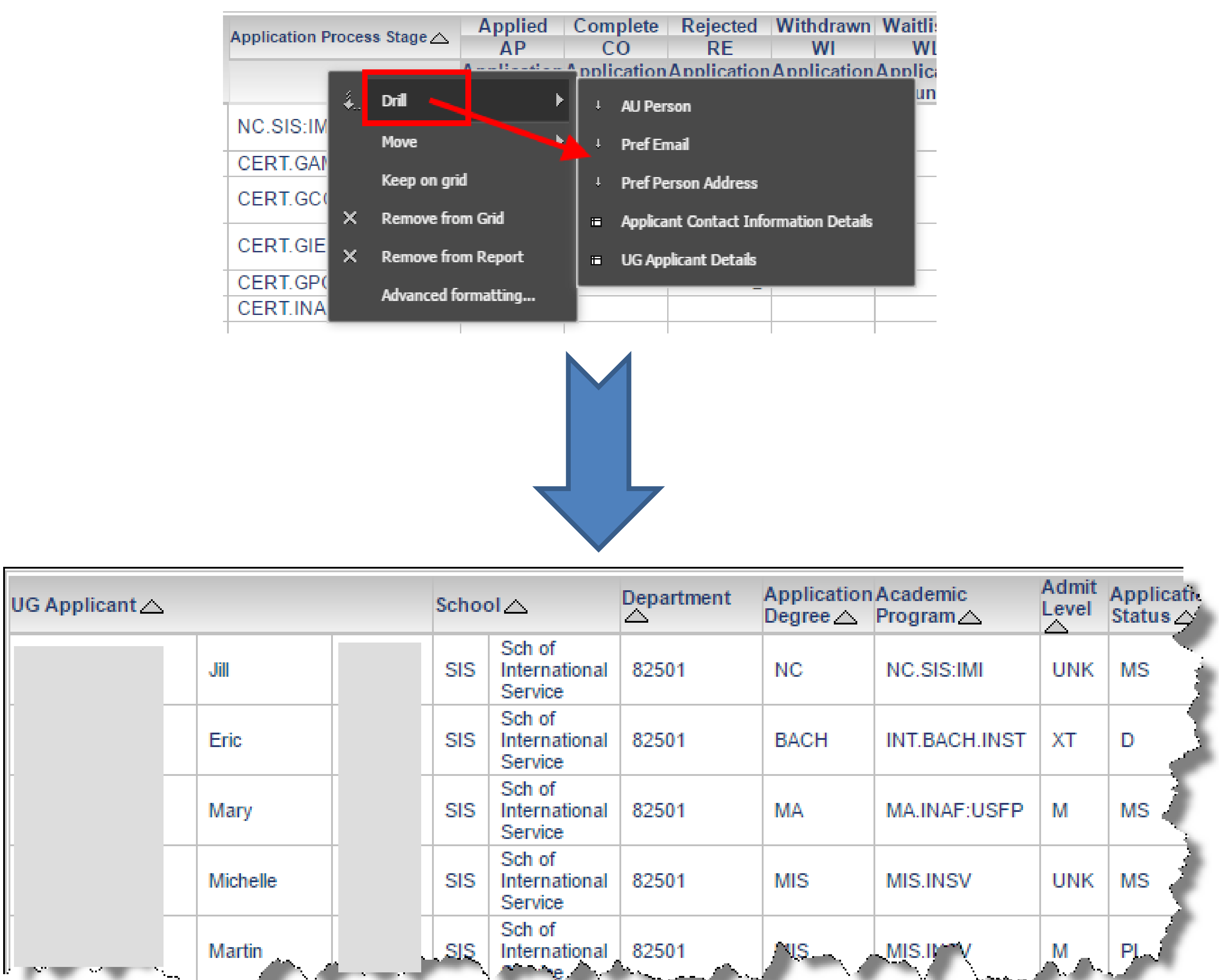
1. You can improve the readability of the data by adding **BANDS** to the data.
2. MicroStrategy automatically groups like attribute values in the rows so that you only see a single value for attributes. For some reports, it may be better to see all of the repeating values. From the GRID menu, de-select the Merge Row Headers option. This will show all values for the attributes in the grid.

Drill Through the Data

Drilling provides a view into the details of the report's data. When data is organized hierarchically in a storage system, the data can be displayed at a high, summarized level, and areas of interest can be investigated all the way down to a low, detailed level.

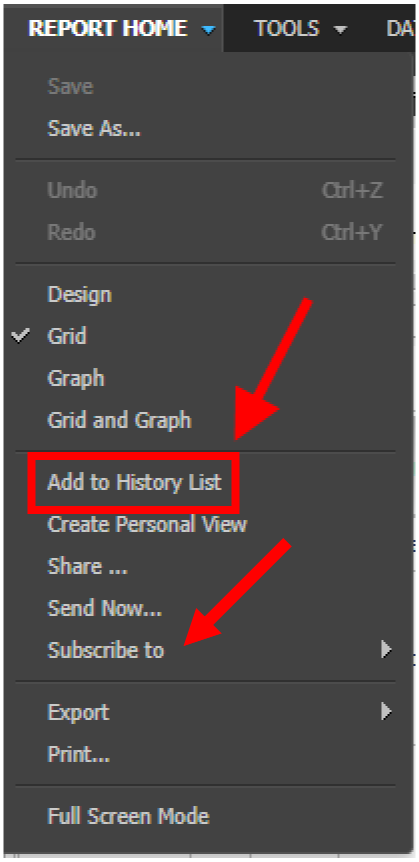
Drilling allows users to change the initial report definition dynamically without having to design and store the new reports beforehand.

1. Some reports already have drills to different reports or additional values. If an attribute or metric value is underlined, you should be able to click it and be taken to either a more detailed report or add additional report elements to the report you are viewing.
2. In the **GRID** report, right-click on any column or row heading and select **DRILL**.



Using the History List

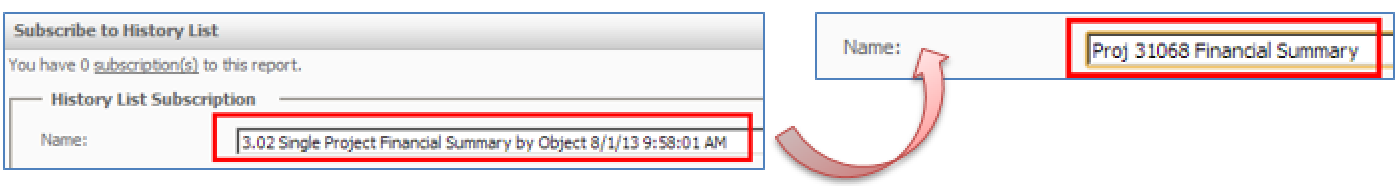
The **HISTORY LIST** is a tool that allows you to view previously run reports. Reports are not added to the list automatically, but may be added manually or subscribed on a pre-determined schedule. Once you have subscribed to a report, the results will run automatically and will be saved in the History List.



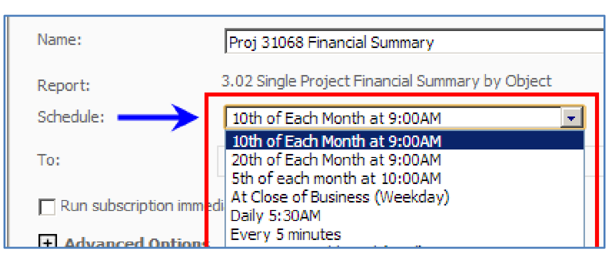
1. If you have **RUN** a report you would like to have sent to your **History List**, you may add the report while it is running from the **PROCESSING REQUEST** page or using the **Add to History List** option on the **REPORT HOME** menu.
2. If a report is not prompted or has default answers selected, you can subscribe to have the report delivered to your history list on a regular basis.
   - Click the dropdown arrow next to **HOME**, click **SUBSCRIBE TO**, slowly move mouse to the right and select **HISTORY LIST**.

3. In the dialog box that opens, set the following:

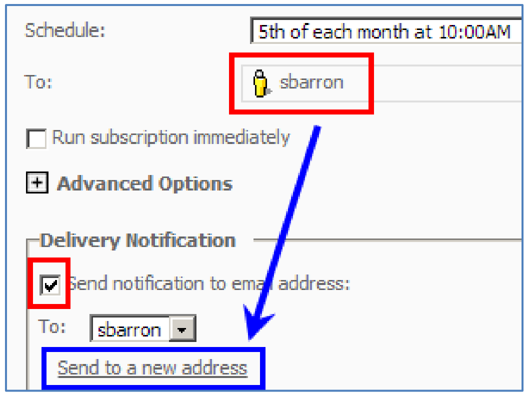
REPORT NAME: You can edit the report name to a more descriptive name.



SCHEDULE: The report will automatically run on the scheduled date you select from the dropdown.

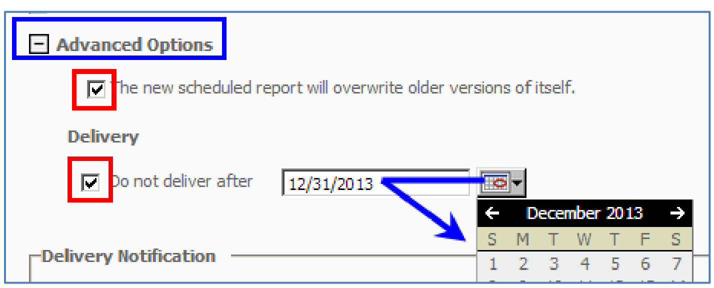


TO: By default, your email address will receive notification that the report has been run and is available for you to view in your **HISTORY LIST**. To email a notification to another address letting that person know that the report has been run, click the ***Send to a New Address*** link at the bottom of the dialog box. This option DOES NOT send the report to that person...only notification that the report is waiting in your History List!



RUN SUBSCRIPTION IMMEDIATELY: Check this box if, after clicking OK to close the dialog box, you want the report to run now instead of waiting until the Scheduled Date. The report will still run on the scheduled date in addition to being immediately run.

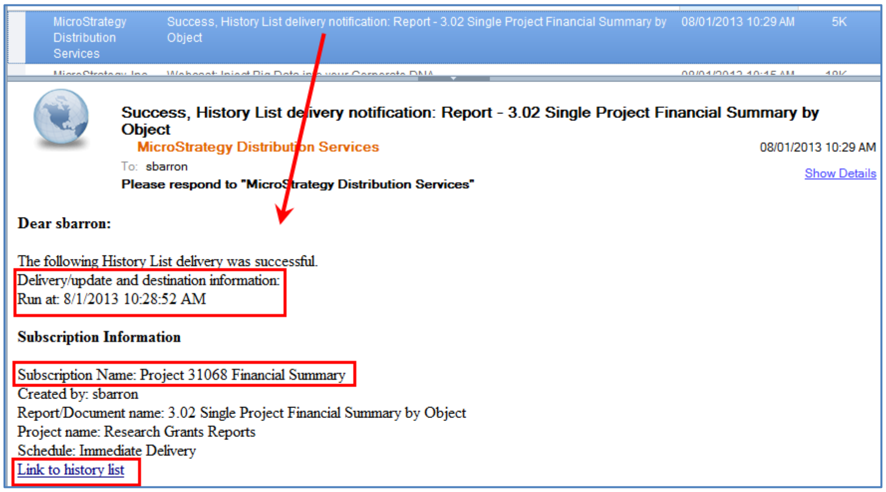
ADVANCED OPTIONS: If you want only the new copy of the report when it is run (ie. the 5th of next month) and the older copy deleted, check the box next to ***The new scheduled report will overwrite...***
If the report does not need to be run after a particular date (ie. end of fiscal year), check the box next to ***Do not deliver after*** and select a date from the calendar picker dropdown.



Click **OK** to save your settings.

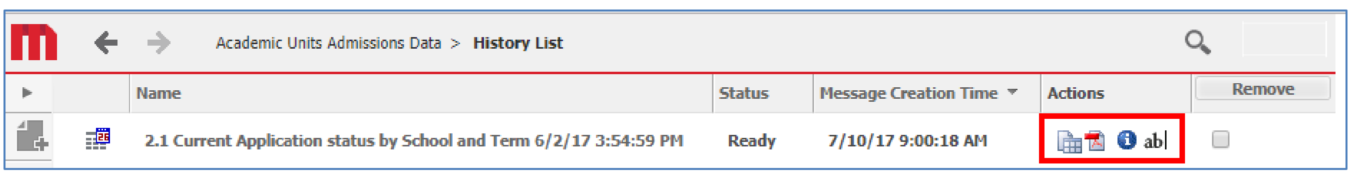
View the Report from your History List:

- **EMAIL NOTIFICATION** that the report has run and is saved to your History List:



- **LOGIN** to BI Reporting, select a **PROJECT FOLDER** (ie. Graduate Admissions), click the **MicroStrategy M** from the upper left corner and select **HISTORY LIST**.

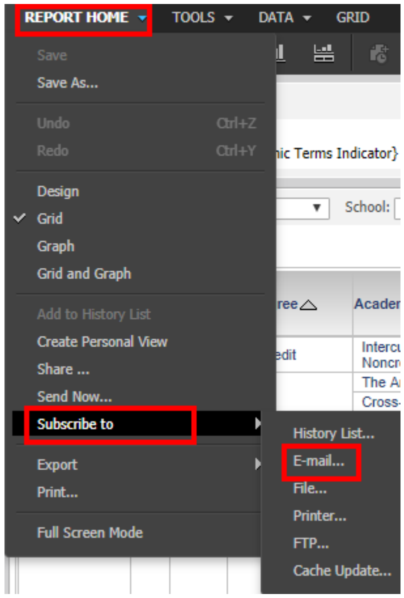
- **CHOOSE** one of the following: export the report into Excel, view the report in Adobe Reader as a .PDF, rename the report, or to delete the report from this list, click the Remove checkbox.



- To **REMOVE** the subscription (stops the subscription, does not delete the report), choose **MY SUBSCRIPTIONS**, checkmark the box under **Unsubscribe** and, then, click the **UNSUBSCRIBE button**.

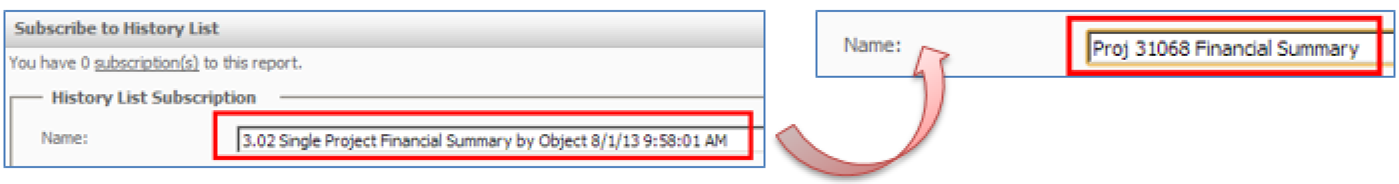
Creating Email Subscriptions

1. **RUN** the report. Note: The report must not be prompted or the report must have default answers selected in order to be used as a subscription.
2. Click the dropdown arrow next to **HOME**, click **SUBSCRIBE TO**, slowly move mouse to the right and select **E-MAIL**.

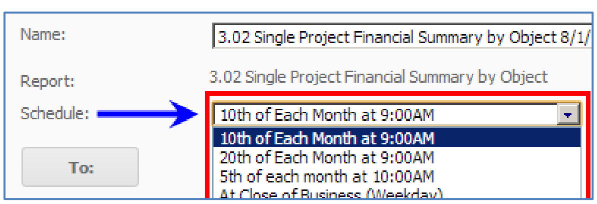


3. In the dialog box that opens, set the following:

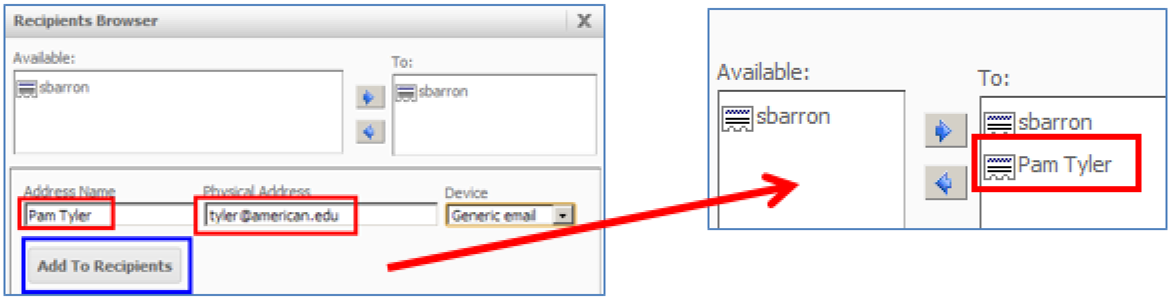
REPORT NAME: The report name can be edited to a more descriptive name.



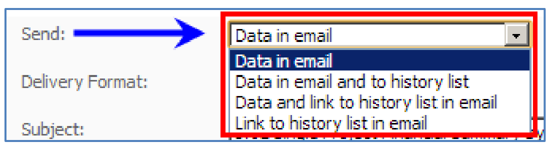
SCHEDULE: The report will automatically run on the scheduled date selected from the dropdown.



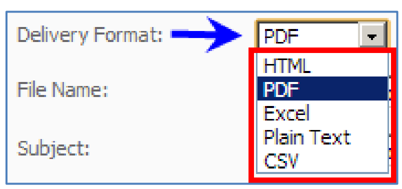
TO: Click the **TO button** to open the ***Recipients Browser*** dialog box. Select an email address to send the report to by clicking the **ADD TO SELECTIONS arrow** to move one or more recipients from the **Available list** on the left to the **To list** on the right. If you do not see the correct email address to use, type a ***name*** to refer to the email address in the **ADDRESS NAME** field and type the ***email address*** in the **PHYSICAL ADDRESS** field. Click **ADD TO RECIPIENTS** to add the address. Click **OK** to close the dialog box.



SEND: Specify how the report or document is included in the email.



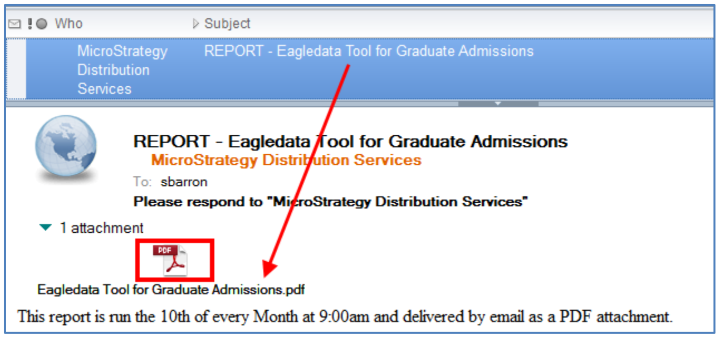
DELIVERY FORMAT: Select the format in which to send the report or document. When **Excel** or **PDF** is chosen, the report is included as an <u>attachment</u> in the email.

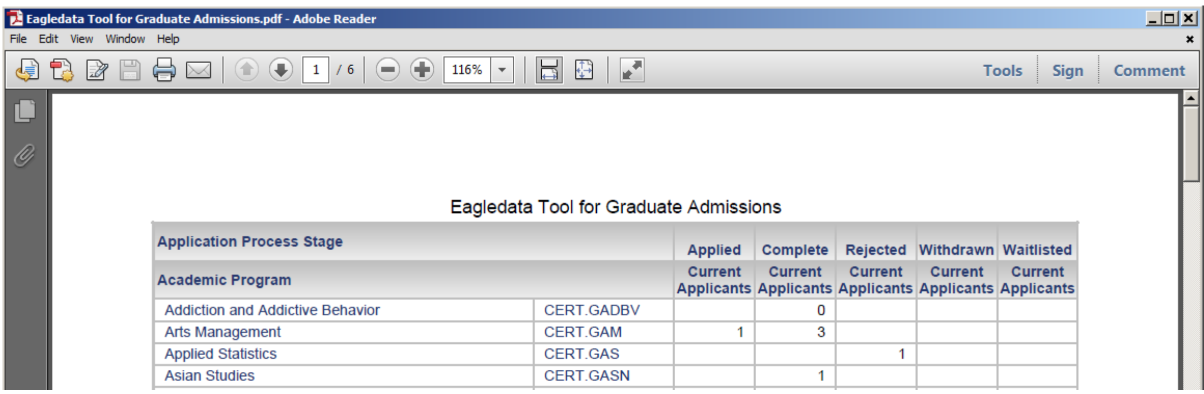


Click **OK** to save your settings.
NOTE: If you are subscribing other people to the report, the recipient will receive the email from the system as *AU Business Intelligence*. If the recipient replies to that email, it will come back to the IT department as a helpdesk ticket. Generally, we will forward along any personal responses, but in some situations it may be better to export a report and email it manually. This is especially true if you expect the report to generate an email conversation.

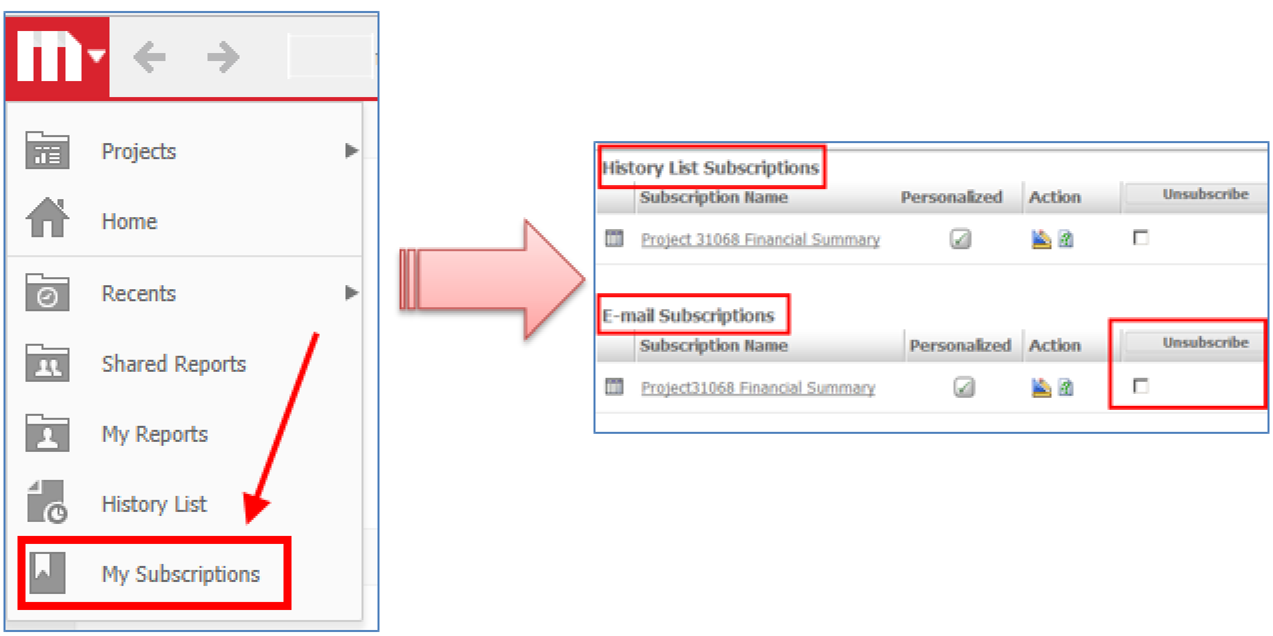
View the Report:

- **EMAIL NOTIFICATION** that the report has run and is included as an attachment in the email:





- To **REMOVE** the subscription (stops the email, does not delete the report), choose **MY SUBSCRIPTIONS**, checkmark the box under **Unsubscribe** and, then, click the **UNSUBSCRIBE button**.



GETTING HELP

For additional assistance, please contact the **OFFICE OF INFORMATION TECHNOLOGY HELP DESK**:

- helpdesk@american.edu
- 202-885-2550
- AskAmericanUHelp
- http://help.american.edu