ENTERPRISE APPLICATION SERVICES

BUSINESS PROCESS ANALYSIS

CAMPUS-WIDE REPORTING AND BUSINESS INTELLIGENCE DISCOVERY PHASE

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This discovery report is based on information gathered during interviews with the above-listed stakeholders and process owners from May 2019 to August 2019. All proposed recommendations should be further discussed amongst senior management, process owners, and stakeholders to determine the funding sources, scope, and necessary resources to support the desired outcomes.

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A. Background

Over the years, there seems to have been no centralized effort to establish a common reporting platform at Western. As a result, many units and departments selected to use what was available to them or from 3rd party vendors that were tied to their specific functional areas. This siloed approach resulted in many different reporting tools with multiple data sources. Functional departments have come up with solutions on their own resulting in a proliferation of Microsoft Access database shadow systems, hordes of Excel spreadsheets to track and share data in dissimilar systems, and a large number of users connecting directly to Banner and the university's data warehouse to directly query data using SQL Developer. The issues Western is now facing are a lack of data integrity, untimely reporting, and very labor-intensive reporting processes that are not sustainable.

From the initial observation, Western seemed to have many reporting/analytics business intelligence tools. After speaking with discovery session participants, many of the tools are actually tied to specific systems that could not be replaced by a standalone solution. Past enterprise solutions implemented across campus still available today are Banner job submission reports, BI Query, and Millennium FAST. Banner job submissions reports require programming resources from Enterprises Application Services and do not meet users' need for quick turnaround. BI Query is no longer being updated or improved by the vendor, is cumbersome to install, and requires 32-bit ODBC Oracle drivers installed on end users' workstations. Millennium FAST only contains Human Resources, Finance, and Budget data. Millennium FAST has a separate database that is not connected to the university's data warehouse that stores student information. *See Appendix 1 for a list of reporting tools actively being used at Western.*

B. Approach

Over the past decade, higher education has undergone profound transformations and in recent years, grown much more competitive. Here at Western, there are more urgent needs for ad-hoc reporting and presentation of data to management for fast decision-making purposes. Western personnel are concerned about the inadequacy of our current reporting tools. Requests have been coming into Enterprise Application Services for procurement and implementation of a unified reporting platform. Strategically, Western must have a better understanding of the current situation and the immediate and future reporting needs, before any selection of a reporting tool. Therefore, a discovery phase was conducted from May to August 2019 with a total of 43 stakeholders in 28 separate discovery sessions across the campus. These stakeholders were asked about their current reporting challenges, what they have tried that is not working, and their reporting/analytics and business intelligence requirements going forward. *See Appendix 4 for the list of interview questions.*

C. Some Key Pain Points

Many discovery session participants expressed their frustrations with how difficult it is to obtain and analyze data that exists in so many different systems. Many users feel like there is no clear direction nor documentation on where to find data. Combining data from multiple data sources is time consuming and challenging to users that may not have data management experience. Changing business rules from one year to the next for departments with federal/state reporting requirements has been a challenge due to the manual process of combining data from multiple data sources. Even though state/federal reporting makes up a small percentage of the overall reporting delivered at the university, it is often complex and time-intensive to interpret the business rules to identify how raw data can be derived to meet those rules. *See Appendix 5 for a list of detailed pain points collected during the discovery sessions with stakeholders.*

D. Conclusions

In summary, purchasing a tool is not going to solve the issues that many are facing when it comes to reporting and business intelligence. Having a good tool will help. However, it is more important that the university dedicates resources towards establishing and maintaining foundational data governance principles. This would achieve a single version of the truth across the enterprise with the end goal of making better decisions.

E. Recommendations

Short-Term

1. Establish a Campus-Wide Data Governance Body

   The two most important issues are where to obtain the data and what is the meaning of that data. Western certainly has no shortage of data. To ensure reliable metrics about institutional performance, it is critical to establish a data governance body. This governance body would provide guidance towards efforts to determine data ownership, document data standards, maintain an institutional-wide data dictionary, data definitions (single source of truth), provide guidance for data sharing, decision making, and communication. It is critical to have a data stakeholder to oversee this governance body in partnership with central ITS.

2. Use Argos as an Interim Operational Reporting Tool

In addition to setting up a campus-wide governance body, Western needs to address immediate reporting needs. Because determining a common reporting or business intelligence tool will take a considerable amount of time, it is recommended to use the Argos reporting tool as an interim solution for operational reports. Argos was licensed from Evisions a few years ago by University Advancement. Since then, several departments, including University Advancement, Financial Aid, Registrar's Office and The Office of Institutional Effectiveness have been using or testing it as a reporting tool with some success. Even though this is an interim solution, Enterprise Application Services and functional departments must assign proper resources to support the training and rollout of this tool. *See Appendix 2 for a detailed description of Argos*.

3. Minimize the Use of Microsoft Access as a Front-End Tool to Query Data from Banner

Users that need to get information out of Banner should do so using an enterprise reporting solution that is centrally managed and does not require desktop ODBC connections or individual Oracle accounts. The solution should be optimized in a way that limits the load placed on the Banner ERP transactional database, which is mission-critical for the university. In the interim, use Argos as a front end instead of Access, if possible.

4. Replace BI Query (Front-End) with Argos

Because BI Query has been de-supported by the vendor for many years, Western must retire BI Query and replace it with Argos. The institutional knowledge of BI Query is fading due to staff turnover. It is recommended that Western survey users that have logged into BI Query recently and find out the specifics of their usage. Enterprise Application Services should meet with these BI Query users and assist them in the migration to Argos or other existing tools that suits their purpose. *See Appendix 2 for a detailed description of Western's existing enterprise reporting and visualization/presentation tools*.

5. Review and Limit ODBC Connections to the Banner Database

After the implementation of recommendations 2, 3, and 4 above, the need for direct ODBC connections can be reduced. It is recommended to have a review of all current ODBC connections and determine whether they are still necessary. The data in Banner is not optimized for reporting and difficult to interpret without in-depth knowledge of the backend table structure. If end users need data from Banner for reporting purposes that is not in the university's data warehouse or Millennium FAST, that data needs to be identified and prioritized to be loaded into the data warehouse under the guidance of the data governance body. Users that have a legitimate business need to connect to Banner test and production database instances via SQL Developer could continue to do so. These users are functional IT users

proficient in writing SQL queries who understand Banner data structures. *See Appendix 2 for a detailed description of SQL Developer*.

6. Determine an Interim Business Intelligence & Data Presentation Tool

To bridge the gap between the immediate needs and the final selection of a common business intelligence and data presentation tool, it is recommended that the campus use Microsoft Power BI. There are approximately 50 Power BI users and 10 Tableau users at Western. Both groups of users are satisfied with their tools at this point. For Tableau, users are using single licenses and have no access to features included in the enterprise licensing. From a cost standpoint, it is more economical to use Power BI because it is tied to our Microsoft product suite and costs $27 a year for each user. If all users have this license, they can share and view their data, analysis, and reports at any time. Currently, a Tableau Creator single-use license is $840 a year. This license allows users to create visualizations in Tableau. However, anyone that needs to view the visualizations must purchase a Tableau Viewer license at $144 a year. Any new requests for a data presentation tool should be directed towards using Power BI rather than obtaining new licenses from Tableau.

Longer-Term

1. Data Governance Body Appoints a Team for the University-Wide Reporting & BI Tools Selection & Implementation Project

The goal of the data governance body is to be the gatekeeper of Western data management, data integrity and single source of truth across the institution. It is therefore logical for this governance body to be the sponsor of the Reporting & BI Rethink overall project. In addition, it is critical for Western to have dedicated resources in the areas of reporting, data analysis, and presentation moving forward, to ensure the solution(s) implemented are sustainable. When allocating resources to the project, post-implementation operational support, development, and training must also be taken into consideration.

2. Perform Detailed Analysis on Campus Reporting and Business Intelligence and Data Presentation Tool Needs

During the discovery phase, high-level reporting requirements were collected. Going forward, a more detailed needs assessment must be performed with report stakeholders in different areas. The result of this needs assessment would be used as the base to compare different in-house tools and determine whether an RFP is required. *See Appendix 6 for the high-level reporting requirements gathered during the discovery sessions.*

3. Compare Existing Standalone Operational Reporting Tools

    Based on the needs assessment, stakeholders must compare existing tools and determine, pros and cons; fits and gaps.

    Existing operational reporting tools after implementing short term recommendations will be: Argos, Banner Job Submission Reports, Microsoft Excel, Millennium FAST HR, Finance, Budget & Forecasting and Oracle SQL Developer.

    See Appendix 2 for a detailed description of Western's current reporting and visualization/presentation tools.

4. Compare Existing Business Intelligence and Data Presentation Tools

    Based on the needs assessment, stakeholders should compare existing tools and determine, pros and cons; and fits and gaps.

    Existing business intelligence and data presentation tools are:
    Power BI and Tableau.

    See Appendix 2 for a detailed description of Western's current reporting and visualization/presentation tools.

5. Assess the Current Data Warehouse Environment

    Based on the needs assessment, Enterprise Application Services should partner with stakeholders to assess the current data warehouse environment. The data warehouse model, data sources, load processes, and platform used to store the data should be factors considered in the assessment.

6. Make Recommendations to the Data Governance Body for Long Term Solutions

    Based on the needs assessment, stakeholders should examine other potential tools in the marketplace as possible alternatives to Western's existing and interim tools.

    See Appendix 3 for a detailed description of other potential reporting and visualization/presentation tools as alternatives to existing tools.

Appendix 1 – Current Reporting Tools

Participants of discovery sessions where asked about reporting tools used in their departments. The following tools were reported.

Reporting Tools
AdvisorTrac
AimIQ
Archive Space
Archivematica
Argos
Banner Job Submission
BI Query
BIRT Report Designer
Campus Labs
Concur
Contract Management Module (CMM)
Crystal Reports
Degree Works
Google Analytics
Google Siteimprove
Jira
MABEL
Marketplace
Microsoft Access
Microsoft Excel
Microsoft Power BI
Millennium FAST Budget & Forecasting
Millennium FAST Finance
Millennium FAST HR
PageUp
PCR-360
Qualtrics Surveys
SAS
Splunk
SPSS
SQL Developer

SSH
StarRez
Student Success Collaborative
Symplicity Advocate
Symplicity - Viking Career Link
T2 Systems - Parking Iris
Tableau
Terra Dotta
Transit
Western Involvement Network (WIN)
Xenegrade
YouTrack

Appendix 2 – Western's Current Enterprise Reporting Tools with Detailed Descriptions

A. Argos - Already Subscribed

Argos is an SQL based on-premises enterprise reporting solution offered by Evisions, a higher education software company, used primarily to develop and deliver dashboards and reports to users within a functional department. Designated Argos DataBlock designers for each department can create Argos DataBlocks and dashboards for report writers and report viewers to use. Because the solution is on-premises, SQL queries can be performed directly against on-premises data sources set up for use with Argos, such as Banner and the university's data warehouse, without having to query against static data sets that need to be refreshed.

Currently, Argos is being used extensively by University Advancement for operational reporting needs to deliver over 300 dashboards and reports to University Advancement staff and others across the campus. The dashboards and reports are connected to data warehouse tables in Western's locally developed data warehouse database (DATAW). The Registrar's Office has a small number of reports in Argos for connecting to and querying data out of the Degree Works database that is not accessible within the Degree Works application. Financial Aid is in the early stages of developing Argos reports to replace Microsoft Access reports that rely on ODBC linked tables within Access.

One of the advantages that Argos has is that the data connections for Argos dashboards and reports are managed at the application level. The application has a service account so does not require each user to have an ODBC driver installed on their computer nor require each user to have their own database user account to run reports. Argos also provides a web interface that allows report viewers to run reports in their web browser without having to install any software on their computers at all. Users who create DataBlocks and reports do require client software to be installed on a Windows-based system.

B. Microsoft Power BI - Limited Use

Microsoft Power BI is a business analytics tool and service that allows users to transform data into visualizations and publish them to a dashboard that can be shared and accessed by others on any device. Currently, it is primarily being used by Academic Affairs and University Advancement. Outreach and Continuing Education has plans to explore and use the features this tool offers as well. Power BI and Tableau are similar solutions. Power BI users have a strong preference for Power BI over Tableau and Tableau users have a strong preference for Tableau over Power BI.

A Microsoft Power BI Pro license is required to both create and view visualizations that require authenticated access. Some departments on campus have purchased Power BI Pro licenses, which cost around $27 per user per year as listed in the ATUS Software Catalog at https://atus.wwu.edu/microsoft-power-bi-pro. Users create visualizations with Power BI Pro and then publish their visualizations to their

own workspace in Office 365. Once the visualization has been published to a workspace, it can be shared with other users much like you would share a document on OneDrive. Except, in order for a user to view a visualization that has been shared to them, they also must have a Microsoft Power BI Pro license, even if they do not want to use the tool to create visualizations.

Currently, users at Western that are producing Power BI visualizations are using Microsoft Excel spreadsheets as data sources. It is possible to set up a data source to a database connection, such as the university's data warehouse through a gateway instead of using Excel as source data, but this would require extra set up and support from central ITS. Architectural decisions would need to be explored to see how often data could be automatically refreshed through the gateway to data sets that user's visualizations are pointing to. A major challenge would be managing the refreshes in a way that did not place a heavy load on the backend database when too many refreshes occurred at once.

Another option would be to create a custom web application hosted in Azure that owned all the data being published to visualizations for the university and holds the Power BI Pro license (like a service account). Then the web application could serve up the visualizations by hosting them on a web site that could be either publicly accessible or require authentication. The advantage of this approach is that the data refreshes could be centrally managed by Enterprise Application Services and users would not need a Power BI Pro license to view a visualization. This would have to be tested as a PROOF OF CONCEPT but has potential as an affordable analytics and business intelligence solution for the university using an existing tool that some users are already familiar with.

More information about Power BI can be found at https://powerbi.microsoft.com/en-us/.

C. Banner Job Submission

Banner job submission reports are used extensively by almost every department on campus. These reports have been developed by Enterprise Application Services over the course of decades. The reports delivered out of Banner are available as formatted PDFs and data downloads, such as CSV files.

Functional users are not able to create and maintain Banner job submission reports. These reports are created and maintained by systems analysts and programmers in Enterprise Application Services under the direction of programming requests initiated by functional department technical IT staff. There are over 1,400 Banner job submission reports available in Banner today. In order to run reports in Banner, users must have a user account to login to Banner and be granted permission to run the report via Banner security.

Banner job submission reports have served the university well for many years as an enterprise reporting solution to deliver reports out of Banner. However, the reports delivered out of Banner are relatively time consuming to produce and maintain compared with modern reporting solutions available to today. Also, many discovery session participants reported the need to produce their own reports as a requirement for a future tool with decreasing reliance on Enterprise Application Services to create reports for functional departments.

It is worth noting that Banner does not come pre-delivered with any reports or reporting engine to produce reports. This is why Western modified Banner job submission to generate reports in the first place. Interestingly enough, Evisions and Ellucian announced a partnership in April 2019 that states that Argos will become an embedded reporting solution for customers of Ellucian Banner SaaS. More information about this announcement can be viewed at https://evisions.com/resources/blog/higher-education-software-leaders-expand-partnership/.

Converting existing Banner reports to a new enterprise reporting solution implemented by central Information Technology Services is a huge project by itself, requiring dedicated staff and resources to accomplish in a timely manner. Ideally though, whatever campus-wide solution that is chosen for future long-term reporting at Western should meet the needs of Enterprise Application Services to create new reports and/or replace existing Banner job submission reports.

D.   BI Query

BI Query is one of the front-end access points to the university's data warehouse. The tool allows users to run previously created reports and queries, modify existing queries to their specific needs, or write new queries to answer data-related questions. BI Query provides an easy-to-use, visual way to query data out of the data warehouse. By using the data model in BI Query, users can easily form queries without needing to know Structured Query Language (SQL).

Hummingbird Software originally developed the product. Then it was purchased by OpenText in 2006. The product is no longer being improved by OpenText and should be retired or replaced with another solution. Since BI Query is just a tool for connecting and querying data from the university's data warehouse, the data stored in the database tables of the data warehouse will continue to persist for use by other tools and processes outside of BI Query.

BI Query was not reported as being very widely used among the participants of the discovery sessions conducted but does fit a niche need for users than need to quickly query data out of the university's data warehouse without having to know how to write SQL. The Office of Institutional Effectiveness relies on BI Query to perform population selections on students based on varying ad hoc requests to get a list of Western IDs that can be combined with data in other systems. It may be that the academic colleges that were not interviewed in the discovery process, such as Woodring or CBE, are using this more than other administrative departments on campus. The BI Query administrative interface can display recently logged in users but does not have the capability to show all logged in users for a given time range. However, it is possible to retrieve a list of every user that has ever logged into BI Query. The number of users is around 200, but the users that make up that number could have logged in once 3 years ago or just yesterday. Recent logs show that there about 20 users consistently using the product university wide.

A good next step to get a better idea of how much the tool is being used and by whom would be to conduct an electronic survey to all current staff included in the list of users that have ever logged into

BI Query. The goal of the survey would be to determine who is using BI Query and how they are using it now as a critical tool to do their job in order to retrieve information from the university's data warehouse.

E. Microsoft Access (local databases tables and linked ODBC tables)

Microsoft Access is a desktop database that is part of the Microsoft Office suite. The database tables in Access can be linked to tables that exist in an enterprise database, such as the Banner ERP or university data warehouse database through an ODBC connection. Tables can be locally created within the instance of an Access database as well. Having to install and maintain ODBC drivers on individual user machines for connecting to Oracle is problematic, especially for users who are moving to the 64-bit version of Office who need to have both 32-bit Oracle drivers (for BI Query) and 64 bit Oracle drivers (for Access 64 bit) installed on their desktops.

Microsoft Access is one of the most widely used reporting tools being used across campus. Many of the Access databases were developed by student employees. Departments place their Microsoft Access databases on the P:\ drive for shared access by department staff.

Microsoft Access is not going to go away since it continues to be a core product delivered by Microsoft in the Office suite. However, it is concerning that so many departments are using this tool as part of their critical operations because it creates shadow systems that are not centrally managed. This is a security risk, and causes data integrity issues because departments are mixing and matching local data with institutional data retrieved from Banner, the university's data warehouse, and Millennium FAST.

Office 365 is available to all university staff to store and share documents, so there will be less and less of a need to continue to provide shared department network drive space for file storage. It is not possible to share an Access database in Office 365 the same way you can in a network drive that allows multiple users to open and perform edit operations on records at the same time. Microsoft retired Access Services in Office 365/SharePoint Online in April 2018 and has aligned its efforts behind Microsoft PowerApps as a way to build no-code business solutions in the Office 365 ecosystem similar to what Access provided for desktop users.

F. Microsoft Excel (charts, graphs, etc. and data being entered and formatted)

Microsoft Excel is included in the Microsoft Office suite and is the most widely used tool for reporting among discovery sessions participants. Many users export data from external systems and store it in Excel to transform and manipulate tabular data stored in spreadsheets. Data from Banner reports and downloads are frequently combined and transposed into Excel spreadsheets and saved in restricted folders on the P:\ drive or Office 365 for central access by internal department staff. In some cases, data is compiled in Excel to use as data sets for further analysis in Microsoft Power BI or Tableau.

Implementing a campus-wide reporting and analytics solution would not eliminate the need for Microsoft Excel. However, it would help eliminate inefficiencies for departments that are currently

manually transposing data into Excel for analysis and sharing with others. Microsoft Excel has and will continue to be a versatile tool for storing smaller sets of tabular data, reporting on it, and sharing data with others.

G. Millennium FAST HR, Finance, and Budget & Forecasting

The Millennium FAST (Fast Administrative Support Tools) for HR, Finance, and Budget & Forecasting software offers pre-built reports and visualizations to data and provides drill-down capabilities not available in Banner. Millennium FAST can be access via a web browser and requires no additional software to be installed on end users' computers. It is among the most widely used tools reported by discovery session participants. However, many users in functional departments outside of Accounting Services, Budget Office, and Human Resources use it to only access a few specific reports to get HR and finance data that comes from Banner. The data in Millennium FAST is extracted from Banner, transformed, and loaded into a proprietary data warehouse database serviced by the vendor. The Millennium FAST data warehouse database is a separate data warehouse than the university's data warehouse that stores student information extracted out of Banner.

H. Oracle SQL Developer

Oracle SQL Developer is a free integrated development environment for connecting to, managing, and querying data out of Oracle databases. Because the data for both Banner and the university's data warehouse are stored in Oracle databases, many users connect to these databases using their database user account to query data directly out of the database. In order to use SQL Developer to find the data you need, you have to know how to write Structured Query Language (SQL) and be familiar with the names of the tables in the Banner and university data warehouse databases.

I. Tableau - Limited Use

The Office of Institutional Effectiveness uses Tableau to publish visualizations to Tableau Public for the external fact book. The budget office uses Tableau Creator and Tableau Viewer to publish visualizations to tableau online (hosted by Tableau) that is viewed by senior leadership. Transitioning to another platform would be a resource strain on both these departments to take what they have done in Tableau to date and re-create it in another tool. Tableau Public is available as a free download that allows users to publish their visualizations to Tableau's public space at no additional cost. The public space is not FERPA compliant however and requires a lot of extra work to scrub data before publishing the data. Consequently, Tableau public is not be a feasible location to publish visualizations for the internal fact book. Tableau offers other paid options that would allow visualizations to be published to a FERPA protected repository for consumption by end users.

Tableau has several different paid options available that would allow visualizations and data sets to be published in workbooks to a FERPA protected space. The two main options are Tableau Online and Tableau Server.

Tableau Online is very similar to Microsoft Power BI Pro. Users with a Tableau Creator license can publish their workbooks to Tableau hosted cloud storage similar to the workspaces that Power BI Pro users publish to. The published Tableau workbooks could then be shared and viewed by users with a Tableau Viewer license. Tableau Online would require some set up to create a gateway to on-premises data sources that would be linked to data sets needing to be periodically refreshed. Similar to Power BI, challenges would be managing the refreshes in a way that did not place a heavy load on the backend database if too many refreshes occurred at once. Current users of Tableau Online are using Microsoft Excel as data sources for data sets.

Tableau also offers Tableau Server, an on-premises solution as an alternative to the fully hosted Tableau Online option. Tableau Server would require additional staff resources and hardware dedicated to efforts needed to host and support on-premises at Western. The advantages of Tableau Server are that users could connect directly to data sources, such as the university's data warehouse and would provide better ability to centrally manage data connections available to Tableau Creator users.

Instead of functional departments having to create their own reports and analytics visualizations on institutional data, the Office of Institutional Effectiveness (OIE) envisions building out a new internal fact book. The new internal fact book would serve as a resource for departments to perform self-service ad hoc analysis and download data they need from visualizations vetted and published by OIE. Tableau is a potential tool that could be used for building out the internal factbook. Other options would be to use Power BI Pro, Argos or a combination of solutions for this purpose.

One of the challenges of online visualization tools such as Tableau is connecting to on premises data sources. Some universities have chosen to combine a cloud-based data warehouse, such as Snowflake with Tableau. This eliminates the need to coordinate and manage data set refreshes and allows for users creating visualizations to easily connect to the data in a platform that auto scales to meet the performance requirements required during times of heavy usage. Data that exists on-premises is staged and loaded into Snowflake on a regular basis to support reporting and analytics efforts in the cloud. More information about Tableau can be found at https://www.tableau.com/products. More information about Snowflake can be found at https://www.snowflake.com/product/ and an example of how Tableau and Snowflake work together can be found at https://www.tableau.com/solutions/customer/university-notre-dame-10x-faster-analysis-tableau-snowflake.

Appendix 3 – Potential Reporting Tools

A. Ellucian Analytics – Potential

Ellucian offers an Analytics platform that extracts data from Banner via Ethos. Ethos is an integration solution created by Ellucian that allows connected systems to publish or subscribe to data in a higher education data model. Ethos is currently being implemented by Enterprise Application Services for the CRM Advance project to allow Ellucian CRM Advance and Banner to share data with each other. Ellucian Analytics comes with built in reports and visualizations provided by Ellucian based on data that exists in near real-time to ensure analytics reflect the latest possible data. More information about Ellucian Analytics can be found at https://www.ellucian.com/solutions/ellucian-analytics.

B. Entrinsik Informer – Potential

With the recent price increases by Evisions for licensing Argos, many universities are looking to move away from Argos in search of more affordable reporting options. Entrinsik Informer is a solution that has been getting honorable mentions in online discussion groups, such as Ellucian eCommunities.
For more information about how Informer enhances Banner with improved reporting and data integration, see https://entrinsik.com/informer-5-reporting-and-data-integration-for-colleague-and-banner/.

One of the benefits of Informer is that critical processes, such as data governance and security, are built into the solution. For more information about the data governance and security functionality in Informer see https://entrinsik.com/informer/data-governance-and-security/.

C. Millennium FAST Student and Financial Aid - Potential

There are a few departments interested in adding Millennium FAST Student to the existing list of HR, Finance, and Budget & Forecasting solutions currently being offered to users. One of the reasons is to easily combine student data with finance and HR data in the FAST platform to calculate the costs associated with offering a course at Western or to calculate faculty/student ratios. More research would need to be done to see if the source data that comes from Banner that would need to be extracted, transformed, and loaded into the Millennium FAST data warehouse even exists in Banner in a format that could be used to perform the needed calculations.

Purchasing the Millennium FAST student solution would be duplicating aggregated student data in another data warehouse (required for FAST) that is already loaded into the university's existing locally developed data warehouse. It doesn't seem feasible for Millennium FAST student to fully replace the university's data warehouse, especially for critical regulatory reporting requirements such as the Public Central Higher Education Enrollment System (PCHEES) submissions that are required to be submitted by law in Washington State. The programs that generate the PCHEES submission files are dependent on data being loaded into the university's student data warehouse tables. Financial Aid data is also being

stored in the university's data warehouse, which is not part of Millennium FAST Student. However, Millennium offers a financial aid reporting module in addition to the student module as well. More information about Millennium FAST Student can be found at https://mcsl.com/fast-solutions/fast-student-reporting/. More information about Millennium FAST Financial Aid can be found at https://mcsl.com/fast-solutions/fast-financial-aid-reporting/.

Appendix 4 – Discovery Phase Interview Questions

1. What reporting tools do you or others in your department currently use?

2. What data sources do you or others in your department use?

3. What frequencies best describe most of the reporting delivered by your department?

4. Does the delivery method for most of the reports delivered by your department result from manual or automatic processes?

5. Who are the target audiences for reports delivered by your department?

6. What processes do you or others in your department perform to transform or manipulate data to facilitate reporting requirements? Does this take place as part of the report input, report output or both?

7. What security processes does your department have in place to ensure that reports are only accessible to authorized users?

8. What are your current reporting requirements and future needs?

9. What are some of the reporting challenges and pain points you or others in your department face?

10. Are the current tools available to you at Western enough to support reporting for you or others in your department in the areas of operational reporting, business intelligence/data analytics and sharing data with others?

Appendix 5 – Pain Points

The following pain points were expressed during discovery session interviews:

Pain Points
Getting to data in Millennium and PageUp is cumbersome.
No clear direction on who to contact for getting access or setting up data sources.
Not having Millennium FAST Student.
Getting data out of Banner for reporting of annual retirement and healthcare information.
The way data is stored in Banner makes it difficult to include in existing reports.
Changing business rules from one year to the next for federal/state government reporting.
Increasing reliance on ITS to get data out of Banner for compliance reporting.
HR raw data entry - increases burden on HR but would eliminate need to rely on ITS to derive data.
Need a way for director to easily display data to others.
Current methods of generating data visualizations takes a lot of time and effort.
University wide security, providing people with statistics but not person data.
Millennium does not provide needed flexibility and forces you to provide 2-3 parameter values before being able to get to data, need to be able to slice and dice, not be subjected to pre-canned options.
Data exists in multiple places and there is no documentation to provide guidance on where to find data you are looking for.
Need data definitions for Banner tables. Banner acronyms are tough to understand.
Manual processes to get data put into Excel.
Need a way for fast turnaround on ad hoc requests.
Encumbrance is not in Banner for benefits – full compensation is not fully reflected – has to add this as a separate data set in Excel that joins benefit encumbrance to job classifications – can't do that in millennium or other tool.
Need to answer questions that seem like they should be easy to answer, but for some reason finding the data is difficult to deliver to senior leadership.
Meetings should be spent talking about the budget numbers, not talking about how to get the numbers.
Timeline is crucial – next 2 years may be making a lot of changes, need to go in a direction sooner.
Not sure about PowerBI, but not particularly impressed – would be resource strain to take what they have done in Tableau and transform processes to something else.
Budget reporting & analysis – employee resource constraints knowing how to use the tool
Too many reports. Need to take 25% sampling of reports – need to consolidate on standard reports and parameterize, example 1000 down to 15.

Specialized training required for every tool is a challenge.
Need to include faculty needs as well.
Need better controls 1) operations/procedures 2) reconcile data 3) data integrity.
Need standards, not having them creates problems.
HR has more outstanding programming requests – keeping up is a challenge. Audit type reports are handled by FAST. The requests coming from HR now are very complex. They are looking for exception reporting.
Compliance and regulations set by state, federal and the union makes reporting complex. Changes come at least once per year.
For FAST, table names have changed. Cannot reverse engineer to see what it is reporting. Need the vendor to provide a data dictionary. Need these going forward from the vendor.
PageUp reporting is tricky because all information isn't in one spot or easily accessed across systems.
Data in systems such as date, need to convert them to be the correct format. Banner workflow dates are not really date fields and converting these dates to Banner was challenging.
Need to search through vast quantities of text for sub strings.
Look up with VLookup – spaces cause problems.
Places in Banner where text was cut and paste and the special character comes in for the ride. Banner converts to something else like a line break or breaks the data altogether.
Data integrity is an issue. For example, Bookstore employee transferred to Student Business Office. Banner showed position number of Bookstore, but job description of SBO position.
Requesting to recruit and having salary range be wrong in system.
Tracking cyclic employees is difficult.
Trying to get rid of shadow systems for budget tracking and forecasting.
Capital projects reporting - AIM/Ready has report but needs to be more accessible for people funding projects. Example: Cost reporting C100 format doesn't match internal format, construction vs. other costs, total costs vs. subset of costs.
Retirement reporting is difficult. Project for next year. Using a spreadsheet to track and work out benefit costs but has to get data from various departments.
Lack training for sophisticated reporting.
Reporting has largely been quantitative (counting) not necessarily long term. Need more data reporting that tie visits to retention, for example.
Lack of time or resources to do the work.
Data entry relies on manual input, in some cases these are students. Data cleanup is part of the work, the data isn't trusted.
We need a consistent and standard way to track data, for example - student cohorts. How many students in this program? Lack a good tool to get this information. Lack well designed systems for doing this.

Capacity, resources, and time are constraints. Who can dedicate time to developing data streams or reports?
Users – How do they want to consume data reported out of EIS for billing of resources?
Western has done a poor job of centralizing data reporting. No university wide process in place for official data requests. Institutional research should be the keeper of stats and data requests should be vetted by IR or some central department.
A single tool should be available to access published data that is available to all departments.
Meta data and business rules used to transform and load data into our data warehouse are not written down. Buried in SQL code.
No resources are devoted to quality control and auditing data going into data warehouse. Garbage in/garbage out.
Operating as reactive vs proactive is not helpful.
Too many applications to use to get data in correct format. Access tables will only hold 255 fields, but Banner tables have more. Have to use SQL Developer instead to get data. Needs one tool to solve all problems
Relying on EAS to write reports is time consuming and not efficient.
Is Western centralized when it comes to data governance and reporting writing tools? What is the message? Is everyone a stakeholder or are departments in it for themselves to decide?
Limited resources to create financial aid and scholarship reports.
Deciding on in-house vs vendor solution.
Struggle with EOO for affirmative action data.
PageUp should be better than NOVUS.
Systems don't match requiring reconciliation.
Need to supplement data not in Banner.
Leave submodule of PageUp has no history of what happened when to use for bargaining and what if scenario analysis.
Medical leaves & disability possibly still having problems.
Defining who has access to what for permissions? For example, what does a new hire need?
Banner employee performance and corrective action not used because it is not effective.
How to report on stuff stored in imaging system or knowing that it even exists (e.g. metadata, image)?
Banner does not meet needs in reporting on annual salary.
PageUp requires you to create multiple versions of the same report to limit access.
Limiting sensitive data - very important and a big challenge.
Defining how a system does 'X'? Examples: PageUp skipped through too easily.
Biggest pain point is # of Banner reports needed, but not able to test.
Report documentation, especially multiple sections within a report when parameters are used differently for different sections.
Millennium FAST pinned reports need to be organized in a way that makes sense.

Better flexibility with Millennium FAST reports - end up having to run many similar reports and use Excel to combine/consolidate data to manipulate. Have to re-run the report again if you apply a filter.
PageUp emails a single report for each circumstance. Email is problematic because you can't send confidential info in email - e.g. New hire ... convoluted.
Integrating new data into Terra Dotta is costly.
Data not available in Banner, so have to keep track of it elsewhere – example is MS Access for fund encumbering and allocation.
Some Access DBs built by students, so knowledge of system goes away - departments contact Academic Technology for support. Most are working okay - doesn't get a lot of calls anymore.
Having shadow systems where data is not centralized is a security concern.
Many departments cannot wait for enterprise level support solution - e.g. 2 year wait for projects to be developed into workable solution from EAS.
FERPA compliance - only place to store visualization now is Tableau public space - need enterprise license to store information in private/protected space.
Having to use different tools for different databases/data sources.
Data manipulation required to store data in Tableau public, needs a place to store local data.
Tableau public has limit of 15 million rows.
Balance between consumers of reports vs power users can be challenging.
University hasn't chosen a product, so using Tableau public for now, but public space does not provide FERPA protections. As a result, OIE has to spend a lot of time scrubbing data. FERPA constraints what data can be stored in public space used to share information with public.
Resource constraints - staff spending too much time on workarounds to make Tableau public work for needs, cost of enterprise license could be recuperated by inefficiencies and time spent that would not be required if Western had a FERPA protected private space to store the data for internal visualizations. Staff are not able to do what they were hired to do because they are constantly doing workarounds to produce reports that comply with FERPA using the limited public version of Tableau.
Ad Hoc Requests take time – fact book requests for additional information come into OIE and have to be fulfilled on a case by case basis.
Having to divide data sets up into flat files in Excel as a way to scrub and store data in Tableau public to comply with FERPA is not good because you lose ability to efficiently provide drill down capability - the data is disconnected.
Not sure PowerBI is FERPA compliant? Language used by Microsoft? PowerBI public space.
BI Query is not supported and needs to be replaced with another tool for delivering reports to other offices on campus.
Not able to get direct access to Millennium FAST HR tables.
Process for getting changes made to WWU DATAW data warehouse (e.g. add new tables) is not clear.
Having to combine information into flat files due to lack of database table permissions.
Maintaining FERPA compliance while using some tools to deliver information (e.g. Tableau public).
No data dictionary for reference.

Banner student and HR data don't talk to each other - e.g. How many faculty vs. students for faculty/student ratios? PeopleSoft is similar to Banner and the modules talk to each other.
Many reports that were developed in Banner are no longer useable because of change in the way data is entered … would require re-design. Same with BI-Query reports.
Isolation of reports being developed across campus – not an easy way to share what is being developed – how can reports being developed be shared among campus to streamline reporting efforts.
Ability to get metadata output with reporting from campus.
Getting metadata into systems.
Linking to disposition protocol - Authority #.
Too much manipulation needed.
Tough to report schedules to university - Portal?
Need more fined grained security for access to data.
Manual database backups - Have to save copy for their own access to it.
Enrollment management - students coming in and out. Need a mechanism to save seats and get students in and out efficiently. Seat projection, current tool lacks projection capability - once students are here need a way to save seat and project seats.
Degree Works - only tool available to query data is Argos. Only a couple departments are using Argos and they are forced to use this tool as the only way to see the data. Argos has limited ways to combine data sources. RO has had to get creative or they simply cannot get the data needed out of Degree Works. Limited by only having one option with Argos.
Need a place to show what reports are available - need documentation/toolbox. Need a central place to know what tools are available for things like onboarding. Need a place to go for information, including owner, training materials, how tos that explain top level things you need to do and recommended tools for different scenarios and use cases. People need help getting to the tools.
FERPA and other compliance issues tracking is lacking - yes, we can or no we can't. PII data is challenging. Campus needs training. Goes along with other tools - where are we hiding information and who manages the tools being used.
Need a better way to manage security than distributed security model. What are other universities doing? Training should be first.
Large number staff wanting ad hoc requests.
Staff not using tools to get reports (viewing) themselves vs. asking for ad hoc requests.
Power BI and Tableau – sharing reports with people without licensing.
How to make it easy for staff to view reports in existing systems (e.g. CRM) without logging in again and connecting to different data sources.
They don't have people with experience of data or software, so they get incorrect reports. Wrong counts, duplicate lines. Big struggle for them. Reports are developed by students.

StarRez – getting accurate reports. They don't understand the data structures. They can write the reports but can't validate them. Low trust level.
As staff migrate and change, they have to learn new systems – personnel changes learning curve is very steep. Pain point but don't know how to get around it. RD's turn over every 2 years.
Developing standards and implementing training standards – peripheral systems won't go away so how do you build structure, so they are not person dependent.
They don't use same tools, so they don't know if they are cross measuring and hitting the mark. There's no way to share vocabulary. It would be nice to have a shared vocabulary around reporting.

Appendix 6 – High-Level Reporting and/or Business Intelligence Requirements

The following current and future requirements of a tool were expressed during discovery session interviews:

Requirement
Ability to create own reports.
Ability to deploy records retention out to other systems.
Ability to easily provide data at both aggregate and detail levels.
Ad Hoc capability to be self-serving for campus partners to get the data they need - it already exists in the data warehouse. 90% of ad hoc requests that come in are predictable ... OIE needs to be able to build out visualizations in a self-service way so staff can drill down to get the data they need where the backend is secured.
Analytics and predictive modeling – don't have a good way of doing this now.
Assessment reporting cross functional team needed to eliminate duplication of efforts.
Business Intelligence - Need to be able to generate actionable information from data.
Combining Data from Multiple Sources.
CRM Advance could have built in reporting and analytics.
Dashboards.
Data Dictionary (Single Source of Truth).
Data in near time is okay. Next day data will suffice.
Data Visualization - Updates to data sets behind visualizations need to be automatic and not require manual refreshes.
Data warehouse has made the biggest difference.
Director would like access to Tableau to display data to administration.
Easier way to get faculty assignment data.
FERPA Compliance - Solutions should make it easy for individual staff members to comply with FERPA. Audience is a Western "school official" as defined by FERPA. Examples are people who have access to student record level data and such data can be displayed in the visualization for that person (e.g. Internal Fact book).
FIS – Access based system that takes data dump from Banner. Need to find a solution that is not access DB dependent.
Getting data out of Banner to support operational needs.
How many courses is a faculty member teaching?
How many students is faculty teaching?
Managing changes to reports.
Mobile friendly reports.

More granular tracking of data in Banner.
More robust analytics and business intelligence tools.
Need to get reports out of vendor system that are accurate and functional. StarRez is mission critical.
Private place to store data to be able to drill down the data needed and comply with FERPA.
Provide reports to make decisions - projections, predictions.
Querying Data – ad hoc requests - tool should display available tables and fields (unlike SQL developer).
Querying Data - Should come pre-delivered with routine (canned) reports.
Rely on ITS to create reports.
Requests coming from VP/President's office would not fit into normal mold and are the exception rather than the norm.
Row level and field level security.
Something that works with MS Dynamics – CRM Advance. Possibilities are Microsoft SQL Server Reporting Services (SSRS) and Power BI.
Standards and documentation of business rules.
Visualization and data presentation options for high level demonstrations and stakeholders.

Appendix 7 – Reporting Statistics

A. Reporting Frequency

Discovery session participants were asked to estimate reporting frequencies done by their department. The departments with high daily (real time) reporting requirements were Accounting Services, Admissions, Financial Aid, and the Registrar's Office which are heavily reliant on existing Banner job submission reports. As a result, data loaded in data sets, an operational data store, or data warehouse in near time (e.g. next day) would suffice to meet the needs of the reporting frequencies required by functional departments across the campus.

Average reporting frequency performed among discovery sessions participants:

Reporting Frequency	Average Percentage
Ad Hoc	49%
Daily	41%
Monthly	33%
Weekly	21%
Quarterly	16%
Annually	13%

B. Reporting Delivery – Automatic vs Manual Processes

Automated processes exist for scheduled Banner job submission reports and reporting that is tied to 3rd party systems that are not stand-alone solutions. Otherwise, delivery of reports is mostly manual among discovery session participants.

Average percentage of reporting processes that are automated vs manual:

Delivery of Reports	Average of Overall Reporting Percentage
Automated	42%
Manual	65%

C. Target Audiences of Reports

The overwhelming majority of reports produced by departments among those who participated in discovery sessions are for internal department staff, followed by campus partner/stakeholders.

Average percentage of overall reporting by target audience:

Target Audience	Average of Overall Reporting Percentage
Internal Department Staff	62%
Campus Partners/Stakeholders	31%
Public/Community	15%
State/Federal (Compliance)	10%

D. Current Enterprise Tool Usage

Percentage of discovery sessions conducted using the following tools:

Tool	Percentage of Discovery Sessions
Microsoft Excel	82%
Millennium FAST HR	79%
Banner Job Submission	71%
Millennium FAST Finance	68%
Microsoft Access	68%
SQL Developer	46%
Millennium FAST Budget & Forecasting	46%
BI Query	32%
Tableau	29%
Microsoft Power BI	21%
Argos	11%

E. Banner Job Submission Reports

Banner job submission report counts by module:

Banner Module	Read Only Report Counts	Data Update/Process Report Counts
Alumni	16	26
Accounts Receivable	91	24
Extended Ed Summer Program	8	5
Financial Aid	73	39
Finance	211	41
General	47	25
Payroll	473	75
Position Control	28	4
Student	503	173
Totals	**1450**	**412**

F. Reporting/Analytics and Business Intelligence Requirements

In addition to the technical requirements of a tool, discovery session participants agreed on the following important requirements to successfully implement a solution:

Requirement	Percentage of Discovery Sessions
Data Dictionary (single source of truth)	68%
Combining data from multiple sources	68%
Ability to create own reports	61%
Rely on ITS to create reports	39%
Standards	39%

G.   Current Tools Enough to Support Needs

When asked if the current tools available were enough to support reporting among the discovery session participants, about half reported "yes" for operational reporting and analytics. However, over 60% of those interviewed said "no" for sharing and presenting data with others. Having the ability to create visualizations that can be easily created, published, shared, and frequently refreshed with data using an analytics tool such as Power BI or Tableau would help in this area.

Percent of discovery sessions that reported on current tools not sufficient vs. sufficient to meet needs:

Reporting Tool Area	Not Sufficient	Sufficient
Business Intelligence/Data Analytics	52%	48%
Operational Reporting	48%	52%
Presentation	62%	38%

Appendix 8 – Examples of Manual Data Manipulation/Transformation

With so many nonintegrated systems being used at the university it is no surprise that users must transform data for report inputs and outputs. Examples of the manipulation performed by discovery session participants are listed below.

Examples of Data Transformation Reported in Discovery Sessions
60 to 70 percent of reports involve transforming data/labeling as part of the report input. Trying to get data warehouse to help with this logic.
Clean the data, remove outliers, present differently, change names, transform the data, set column widths. Public records requests are given as raw data. Use Google drive to help with parsing data.
Data comes from backend database designed for collection, combines data with other information about students.
Data downloads are run out of Banner as CSV files, then loaded into Access.
Data is transformed on input side, download data, verify, add additional categories, match multiple data sets, compile into MS Excel before generating a report out of combined data set in Excel.
Delinquent financial account analysis – Housing strips off info not needed and then using Excel to sort. Person that used to work for them used to use Tableau to do this work.
Exports data to Excel, combines CSVs for grouping and aggregating. Transforms fields (e.g. codes and descriptions or FinAid Year vs Term Codes).
For the most part, do not need to transform data - sometimes on output to adjust dates, purely ad hoc.
IR Modeling - Transposed to Excel for simplified visualization.
Issue with Tableau - needs flat file data, won't read calculations.
Manipulate in Excel.
Millennium data – Format is not in correct format. Transform into Excel for EIS needs. Manual process but not a big issue. PCR – manipulation to fit Excel, but PCR has helped with this by providing custom reports.
Monthly financial data – raw data from Banner to Access – they have to massage FOAPAL if not used before. They have to assign to correct group.
PageUp gets manipulated, take info and process in Excel.
PCHEES, manually correct NSLDS errors. Transfer data for catalog.
Planning on transforming data out of Slate.
Pretty much all reports. Cross walking processes - stuff from campus in repeating steps from system to system. Reporting to state for retention schedules as Word doc. Manipulates MS Access output. Creating metadata - MABEL metadata is own object.
Report output – color coding.

That's how you do it you don't just give people the raw data. Admissions gets what they need. They had to create a parking report. Registrar - Symplicity conduct system. Our RDs were using an in house system. They would get a big data dump that could be people who needed a conduct meeting.
Very much - requests always needs manipulation.
Within Power BI - Data cleaning, custom measures.
Yearend financial statements - converted from raw format out of Banner and transferred to Excel.

Appendix 9 – Current Data Sources

Participants of discovery sessions where asked about data sources being used for reporting. The following data sources were reported. Many of these data sources are applications that users log into to extract data to a CSV or Excel spreadsheet that is used to combine with data extracted from another system.

Data Sources
25 Live
AdvisorTrac
AiM
Archive Space Platform
Archivematica
Atlassian
Banner (WWIS, WISP, PPRD)
Campus Labs
Canvas
CBORD
Census Data
Clean Address
Clearing House
CMM
College Board Data (Purchase)
Concur
CRC
Credentials
Curriculog and Acculog
Data Subscriptions
DCA-DCP State Retirement Data
Degree Works
eMarkets
Employment Security Dept graduate outcome report
Engagement Survey
Esign
Esign Form Extracts
Event Management System (EMS)
Everfi course completion information

Fidelity Retirement Data
Google Analytics
Google Sheets
iModules
Integrated Postsecondary Education Data System (IPEDS)
Islandora - MABEL
LimeSurvey Database
Marketplace
Microsoft Access
Microsoft Excel
Millennium FAST Budget
Millennium FAST Finance
Millennium FAST HR
National Research Center for College and University Admissions (NRCCUA)
National student clearinghouse
National Student Loan Data System (NSLDS)
NolijWeb
Other - SQL Manager Tables
Other - WorkSource
PageUp
Public Centralized Higher Education Enrollment System (PCHEES)
Reports from Department of Education
Salary CUPA HR Pay Factors
Scale Funder
Sequoa
Spikes Cavell
Splunk
SQL Database Online Course Evaluations
StarRez
Stats from other universities to compare to
Student Success Collaborative
Student Track
Survey Data - General
Survey Data - Microsoft Forms
Survey Data - Campus Labs
Survey Data - CUPA
Survey Data - Google Forms

Survey Data - Qualtrics
Survey Data - Survey Monkey
Survey Data - Word Press
Symplicity Advocate
Terra Dotta
TranscriptPlus
TutorTrac
Twillio
Washington State HR Data
Wealth Engine
WSAC – Student Achievement Council
WWU Data Warehouse (DATAW, WDEV)
Xenegrade
YouVisit Campus Tour Inquiry Data

Appendix 10 – Current Methods in Securing Data

The following security processes were reported by discovery session participants to ensure that reports are only accessible to authorized users:

Security Method
Ad Hoc – scrub demographic data gender, race, date of birth, etc.
Case by case basis for sharing Power BI – shared with specific people.
Millennium FAST – permissions.
Access/Excel – Permissions decided by staff.
Power BI - AD Groups - mostly internal.
Banner reports controlled by Banner Security Classes.
Excel spreadsheets on P:\ drive restricted to internal staff.
P:\ drive restricted access controlled by Admissions.
Banner reports controlled by Banner Security Classes.
Esign form agreeing to confidentiality for other departments needing Admissions data.
Data not sensitive, but confidential - published internally for VP.
SharePoint site with access restrictions.
Own Tableau workbook is not visible to others.
Data source restrictions.
PageUp has report level security.
Permissions vary depending on system.
Trust data is being used responsibly.
Auditor reports uploaded to state web site.
Sensitive information is not emailed.
Store data in Google Drive while at rest.
Banner & Millennium built in security.
Reports are sent to authorized users via email – no sensitive info .
Banner security is used to control access – this was revamped recently.
All the separate systems being used makes security a challenge to manage roles in all the various roles.
Security needs for Financial Aid are granular. Needs fine grained security – row level and field level security.
Scholarship process has built in processes for security. Esign requests for scholarship data.
Everyone gets baseline access.
Targeted group of data requires a written request.
Multiple reports are created to limit access (also a pain point).
Banner security.

P:\ drive restricted access controlled at directory level.
PageUp has restricted security, authentication linked to single sign-on.
Terra Dotta security has application access, query/report level security by individual and group.
Securing data separate process for creating secure site and user provides credentials to login.
Enforces disallow download of data option for data sets published to Tableau public.
Creates separate data sets, e.g. separate out race from GPA to protect identities - only option right now is publishing to Tableau Public - no place to save internally.
Internal fact book not available to public.
Password protect Excel files.
Pre-Aggregate reports to protect individual identities.
Data requestors must fill out a form - follow approval process.
Internal fact book password protected.
OneDrive folder - space to store assessment data - Users control who it is shared with.
Multiple levels on networked drives, locked down to just EE staff or more granular locked down to just certain units.
Final reports don't contain student identifiable information.
Don't get into reporting demographics - work with Institutional Research Board (IRB) and follow their processes.
Directory level permissions.
Systems handle permissions exclusive to this area.
3rd party external data requests would be approved by RO.
Esign forms and code of responsibility.
Encrypt and provide password protected file when sending data via email.
Each custodian blesses authorization of data.
Argos – security to keep access limited to internal department staff.
Row level security using username to lookup PIDM in Argos.
Email used to deliver to campus partner/stakeholders and folder level security in Argos.
Uses SharePoint groups.
All kinds of permissions and users groups. Training on ethics. All students who have limited access go through training.
Their P drive is separated by permissions.
Very few can get into StarRez - maybe 8. Non UR staff cannot get much in StarRez because they are still setting it up.
Banner - enterprise access security.
Housing is custodian of housing components and is filter for RO.
Office products – Single sign on.
P drive division permissions - works with ATUS for this. They don't have a departmental policy – right now. It's organic.
Millennium not secure at all.

Atlassian - WWU single sign on locked down to members of their team.
Google sheets locked down to WWU staff.
Annual review of security - no automated check/audit.
Stopped using O356 because Delve would show docs to wrong people.