CMU 2774  
Data Management and Data Store for Analytics  
Addendum #1  
November 2, 2023

1. The CMU Template Contract is just an example of what is to come upon 'award' of the RFP, is that accurate? Meaning, that is not an example of the additional details you want to see in the RFP response itself, correct?

   The Template Contract has been provided as a specimen for each Offeror’s legal team to review the document and develop any exceptions to be submitted as a separate document named “Exception to Standard Contract”. The contract does not provide details for Offeror’s response.

2. We noticed a discrepancy in the due dates for this RFP. The first page says proposal due date is November 10th, but then on page 5, schedule of activities, it says the proposal submission deadline is November 2nd.

   The published Schedule of Activities contained a typographical error on the due date. The proposal submission deadline has been extended to November 14, 2023, 11:00 a.m. as reflected in the revised Schedule of Activities below.

6. Schedule of Activities

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFP Issue Date</td>
<td>10/18/2023</td>
</tr>
<tr>
<td>Non-Mandatory Pre-bid Meeting [Zoom]</td>
<td>10/25/2023 at 10:00 AM MST</td>
</tr>
<tr>
<td>Written Inquiries Due</td>
<td>10/27/2023 at 11:00 AM MST</td>
</tr>
<tr>
<td>Response to Written Inquiries</td>
<td>11/02/2023</td>
</tr>
<tr>
<td>Proposal Submission Deadline</td>
<td>11/14/2023 at 11:00 AM MST</td>
</tr>
<tr>
<td>Short List Announced</td>
<td>11/21/2023</td>
</tr>
<tr>
<td>Final Inquiries</td>
<td>Week of 12/04/2023</td>
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<tr>
<td>Notice of Award</td>
<td>Week of 12/11/2023 (estimated)</td>
</tr>
<tr>
<td>Contract Issued</td>
<td>January 2024 (estimated)</td>
</tr>
<tr>
<td>Desired Go Live Date (with first level business use cases)</td>
<td>July 1, 2024</td>
</tr>
</tbody>
</table>

3. Is there any possibility of a 2 week extension to the due date? After reviewing the proposal and discussing internally, it would be helpful to have a little extra time to gather the appropriate personnel and resources to respond.

   See response to #2.

4. RFP Reference: Data Management Strategy  
a. Question: Could you elucidate on the interactions between the new Data Management and Integration Strategy and the existing ERP system, especially in terms of data synchronization and integrity maintenance across on-prem and cloud applications?

   CMU currently has a matrix of technologies and methodologies that keep our ERP data in sync with periphery systems, with up to a 24 hour lag in some cases (for outgoing data, for example to Degree Works). We would like to see a platform or strategy that
unifies our data synchronization and offers a consistent, controlled, and as close to real time as possible methodology to manage data changes and integration. We’d also like to see an intuitive platform to define and control directional updates and ability to designate “source of truth”. The implementation of this data platform should be structured so that our current Ellucian Banner ERP (HR/Finance/Student Information System) is a part of a more composable model.

b. Question: Can you elaborate on any existing integration frameworks or middleware currently in use with the University's Banner ERP system, and how do you foresee these elements fitting into the migration to a SaaS platform?

CMU currently utilizes both Ellucian Ethos and Boomi (integration platform as a service) middleware layers for some of the integration framework between our current Ellucian ERP and periphery systems. This has been our newer strategy of choice for our more recent implementations, as we feel utilizing a middleware layer will better position us to migrate to a HR/Finance SaaS system, and at a future point a Student Information System (SIS) SaaS. Ideally, our current middleware layer will be compatible with a data management and data store platform proposed and not need to be re-worked. But we anticipate either adding additional middleware, or additional development in our current environment, in support of this project.

5. RFP Reference: Data Management Strategy (improve data synchronization and integrity)
Question: How does the University plan to manage data synchronization and integrity between on-premise systems, the Banner ERP, and the new SaaS platform, especially concerning historical data and real-time transactions?

CMU looks to Offerors to propose a solid approach and solution to this exact challenge.

6. RFP Reference: Data Management Strategy (development of a comprehensive data management and integration strategy)
Question: Regarding the data fabric architecture, could you specify the preferred mechanisms for handling data heterogeneity such as data virtualization, data lakes, or federated databases, and how these mechanisms should ensure seamless data flow across the ERP, SaaS platform, and other existing systems?

We have existing data flows architected between our Ellucian ERP, multiple SaaS solutions, and other systems, but no strong preferred mechanism is being requested for this data mananagement RFP proposal.

CMU is looking to RFP responders to outline what their recommended approach would be to implementing data integration techniques which will successfully manage data heterogeneity. Ellucian ODS is our current unified view or repository of Banner data. CMU is looking for the ability to combine data from different sources, types, and structures for its data analytic workloads.

7. RFP Reference: Data Management Strategy (The University describes Banner as its “single source of truth” for institutional data)
Question: In transitioning to a SaaS platform, what strategies, such as data governance frameworks or MDM tools, ar being considered to maintain Banner's position as the "single source of truth" while ensuring data consistency across the new environment?
CMU looks to Offerors to propose guidance and a proven successful approach to a data governance framework or MDM tools to help manage this challenge.

8. RFP Reference: Data Management Strategy (improve system integrations, reduce implementation and ongoing support costs)
   Question: What integration patterns, such as microservices or event-driven architectures, are being considered to streamline system integrations and ensure data consistency across the University's ERP and the new SaaS platform?

   CMU looks to Offerors to propose a solid approach and solution to manage this challenge.

9. RFP Reference: Solution Architecture (The University takes a cloud-first approach to delivering applications)
   Question: Could you elaborate on the University's preferences regarding the cloud deployment model, such as public, private, or hybrid cloud, and any specific cloud platforms like AWS, Azure, or GCP that are being considered for this project?

   Any approach or solution proposed will need to be compatible with our current environment of utilizing a hosted cloud Ellucian Banner ERP, and also provide ability to migrate to the upcoming HR/Finance SaaS integration. We currently work with an Ellucian cloud support team for our cloud deployments, and alternately use Ellucian's Cloud Deployment Tool. CMU is not declaring any specific cloud platform preferences for this project, nor do we have a preference on a cloud deployment model. Most of our current cloud application subscribed to run on AWS.

10. RFP Reference: Solution Architecture (Include information on specific Cloud platforms the Solution supports or if the Solution is a cloud-agnostic architecture)
    Question: Is there a preference for a cloud-agnostic architecture to ensure portability and resilience across different cloud platforms, and if so, how should the proposed solution address interoperability and data mobility challenges?

    If a cloud-agnostic architecture to ensure portability and resilience across cloud platforms is something you would recommend, we would encourage you to include that in your proposal along with the arguments in support of the approach. CMU is looking to RFP responders to outline their recommended approach to interoperability and data mobility challenges.

11. RFP Reference: Solution Capabilities (Real-time data integration methods)
    Question: Could you clarify the extent to which the Data Management Solution is expected to support real-time data integration methods and how it will interface with the existing institutional data in Banner?

    CMU currently has a matrix of technologies and methodologies that keep our ERP data in sync with periphery systems, with up to a 24 hour lag in some cases (for outgoing data, for example to Degree Works or our OneCard system). We would like to see a platform or strategy that is able to deliver stable, consistent, real-time data integration methods between a variety of solutions whether cloud, SaaS, or on-premise. For the majority incoming data sources to Banner, we currently utilize Ellucian’s Ethos APIs to provide that interface.

    The implementation of this data platform should be structured so that our current Banner ERP is a part of a more composable model and supports future SaaS applications.
12. RFP Reference: Solution Capabilities (manage integrations between a wide range of different data sources/targets and data structure types)

Question: In terms of managing integrations, could you elucidate on the level of interoperability expected between the SaaS platform, the Banner ERP system, and other existing systems within the University’s ecosystem?

*The proposed interoperability needs to support any combination of systems communicating with each other in CMU’s ecosystem, described in Appendix A, by means of a common central data hub.*

13. RFP Reference: Solution Capabilities (support for near real-time data integration methods)

Question: Could you elaborate on the importance of near real-time data integration methods in the context of the University’s operational and analytical requirements post-migration?

*Having data integrations be near-real-time for our ERP operational data is a priority. However, currently our analytical data (ODS) is refreshed nightly, resulting a 1 day lag of any data changes. We would be interested to learn of proposed methods to improve this data store integration rate, but are aware of certain restrictions behind this model.*

14. RFP Reference: Solution Capabilities (manage integrations between a wide range of different data sources/targets and data structure types)

Question: Can you provide more details on the types of data, such as relational, non-relational, or semi-structured data, and the expected volume of data to be managed? Additionally, how should the proposed solution handle data ingestion and ETL processes to maintain data integrity and quality?

*CMU looks to Offerors to outline what their proposed solution would be to handling data ingestion and ETL processes to maintain data integrity and quality. We currently manage both structured and semi-structured data (image files with metadata associated). Moving forward, CMU sees a need for managing unstructured data such as qualitative student survey data.*

15. RFP Reference: Metadata Management Capabilities

Question: How does the University envision leveraging metadata management capabilities to accelerate the development of analytical data models, especially concerning existing data governance practices?

*CMU looks to Offerors to propose guidance and a proven successful approach to leveraging metadata management capabilities in this way.*

16. RFP Reference: Data Management Solution (metadata management capabilities)

Question: How does the University plan to leverage metadata management in streamlining data governance and facilitating self-service analytics capabilities? For example, through the utilization of metadata repositories, data catalogs, or metadata scanning and tagging solutions?

*CMU looks to Offerors to propose guidance and a proven successful approach to leveraging metadata management capabilities in this way. One specific use case we would like included is using metadata management capabilities for data lineage and master data management.*
17. RFP Reference: Data Management Solution (data orchestration capabilities to feed a data store, data warehouse, or data lake)

Question: Could you provide more insight into the desired data orchestration capabilities, specifically in terms of data pipeline frameworks such as Apache Airflow or Apache NiFi, and their role in feeding data to and from different storage solutions like data warehouses or data lakes?

*CMU has no experience with Apache Airflow or Apache NiFi and does not have an existing data warehouse or data lake. CMU looks to Offerors to propose a strategy and/or solution around data orchestration.*

18. RFP Reference: Data Management Solution (master data management (MDM) capabilities)

Question: Could you detail the importance of Master Data Management (MDM) in maintaining consistency and reducing duplication across the University's data assets? Moreover, how does the University envision MDM being integrated into the new data architecture, such as through a centralized, consolidated, or registry-style MDM?

*Here is one scenario that is a current challenge CMU faces, for which we are hoping MDM could provide a more stable solution: phone number updates. These can occur from multiple sources and multiple departments across campus, such as Admissions, Housing, parents during enrollment, a mobile number entered for MFA, a number submitted for emergency notifications, or a student self reporting a mobile number change through our online self service portal. Which of these options can generate a change for all systems? What sources can push vs consume phone number changes? This is a challenge the University looks to improve upon with MDM.*

*The University would like a Solution that can mature with its composable business model and data governance structures and policies. To do this well, CMU’s current perspective is that implementing a data hub/fabric leveraging a coexistence and/or centralize data architecture would be required, where the data hub/fabric would become part a large part of the University’s single source of truth for its data. CMU looks to Offerors to propose guidance and a proven successful approach.*

19. RFP Reference: AI System Features

Question: Could you provide more detail on the expected role of AI in enhancing data governance and analytics, especially in identifying/supporting new use cases?

*CMU looks to Offerors to propose a methodology to utilize AI for enhancing data governance and analytics. The University’s research shows that AI is becoming more prevalent in data management and analytics to recognize similar data in previously unused or unavailable data sets and if users are using data appropriately.*

20. RFP Reference: Solution that can dynamically identify/support new use cases and analysis through artificial intelligence (AI) (automatic learning from human content to perform and improve on automated tagging)

Question: How critical are AI-driven data cataloging and tagging in facilitating data discoverability and governance? Additionally, how do you foresee these capabilities evolving with the growing data landscape, such as through machine learning-enhanced data tagging, semantic search, or natural language processing techniques?

*The University’s research shows that AI is becoming more prevalent in data management and analytics. That being said, CMU looks to Offerors to propose an experienced approach*
which will assist the University in maximizing our use of evolving AI capabilities, and harnessing the power of enhanced data analytics.

Question: How does the University plan to incorporate project management methodologies like PMP or PRINCE2 to ensure the structured and timely progression of the digital transformation initiative, especially concerning stakeholder management and project scheduling?

CMU expects the Offeror to recommend a project management approach for an successful implementation of their solution that meets go-live requirements on schedule.

22. RFP Reference: Implementation and Support (ongoing support/training handled)
Question: Post-migration, what is the envisioned model for ongoing technical support, training, and knowledge transfer to ensure self-sufficiency and optimal utilization of the SaaS platform integrated with the Banner system?

We will be looking for both initial training, along with the option of a service agreement for ongoing technical support in the future. The University may need additional assistance with tasks after the initial phase of this project, to fully complete our migration to any new platform or solution, but the scope and budget under this RFP is for this initial phase and for go-live deliverables.

For the data management platform portion of this project, we would like to see a detailed outline of how training and knowledge transfer to the CMU IT Information Systems team (6 developers) will be accomplished.

For the data store for analytics portion of this project, we would like to see a description of what supporting documentation will be made available, along with a detailed outline of how training for key functional users will be delivered.

For both, CMU would like the assurance that future ongoing, timely, and effective technical support will be provided post-migration.

23. RFP Reference: System Administration/Management Tools
Question: How does the University envision the system administration/management tools integrating with existing infrastructure to ensure seamless monitoring and management post-migration?

CMU would like to have administrative tools available to monitor the new data hub architecture. As any proposed solution will need to be thoroughly integrated with our existing infrastructure and systems, the administration tool for the data management platform should also provide for any data monitoring and management needed.

24. RFP Reference: Data Management and Data Store for Analytics Solution (system architecture of the proposed Solution)
Question: Could you provide more detail on the anticipated data flow between the SaaS platform, the Banner system, and other integrated systems, particularly focusing on data integrity and real-time synchronization?
See Addendum 1-Exhibit 1 for a high-level overview of system integrations that pertain to Appendix A. The data integration types are listed with the frequency in which the integrations are run.

25. RFP Reference: Data Management and Data Store for Analytics Solution (technical security measures)
Question: Could you expand on the University’s expectations around data security, especially in terms of data encryption, user authentication, and regulatory compliance post-migration to the SaaS platform?

The proposed Solution will store sensitive, confidential or personally identifiable information (PII). CMU has a Data Protection Policy with established data protection principles that require protocols, safeguards, and audit mechanisms to be implemented so no single individual can access, modify, or use institutional data without authorization or detection. Data security safeguards implemented with other systems include but not limited to data encryption, role based access to minimize data exposure, auditing, etc. Regulations such as GLBA and GDPR require the University to protect student private and financial data and delete or remove data when requested and/or no longer needed for business purposes.

26. RFP Reference: Data Management and Data Store for Analytics Solution (Cloud compute, storage, and bandwidth resource capacities)
Question: Could you specify the expected volume of data transactions, as well as the anticipated storage and compute requirements post-migration, to ensure the proposed solution aligns with the University's operational demands?

Storage quantities if known are included in Appendix A and represent the University's largest data sets. The University does not have metrics for the cloud compute cycle used today and looks to the Offeror to help CMU understand post implementation demands based on similar sized universities/customers.

27. RFP Reference: Data Management and Data Store for Analytics Solution (consume, access, transform, consolidate, and deliver data in bulk or batch mode, through ETL or ELT)
Question: Could you elaborate on the University's preferences regarding ETL vs ELT processes and how they align with the desired analytics and reporting capabilities, such as real-time analytics, historical data analysis, or predictive modeling?

In our current environment, we use Boomi and Ellucian ODS for any ETL processing needs. We do not currently use ELT, but recognize it may be part of a future data lake solution. As for preference, if the source system is Banner the University’s preference would be ELT, as it puts a smaller load on the source system. We would be open to either ETL or ELT, depending on the needs of the proposed architecture.

28. RFP Reference: Data Management and Data Store for Analytics Solution (support data persistence for content data, master data, and metadata)
Question: How does the University envision the data persistence strategy, especially in terms of ensuring data availability and reliability for both operational and analytical workloads, such as through data replication, sharding, or backup solutions?

The University would like a Solution that can mature with its composable business model and data governance structures and policies. To do this well, CMU current perspective is that implementing a data hub/fabric leveraging a coexistence and/or centralize data architecture would be required, where the data hub/fabric would become part a large part of
the University’s single source of truth for its data. Based on CMU’s research, the University believes that either data hub/fabric implementation type would require a higher level of data persistence requirements that would include but not limited to maintaining data authorship and lineage metadata. With respect to analytical workloads, maintaining data persistence of decommissioned or replaced applications may also be required.

29. RFP Reference: Data Store for Analytics Solution (data transformation operations of varying complexity)
Question: Could you provide more insight into the expected complexity of data transformation operations, particularly focusing on handling diverse data types and formats such as XML, JSON, or CSV and ensuring they are analyticsready?

The majority of our current information systems data transformations occur between XML, JSON, and CSV.

30. RFP Reference: Technology Stack and Infrastructure (Describe the technology stack, infrastructure, and tools to be utilized)
Question: Could you elucidate on the technology stack, especially the platforms or frameworks planned for developing, deploying, and managing machine learning models? How will the infrastructure support ML model training, validation, and serving at scale?

CMU looks to Offerors to propose a recommended tech stack for these purposes, and the best infrastructure to support the new data management platform and data store for analytics.

31. RFP Reference: Solution that can dynamically identify/support new use cases and analysis through artificial intelligence (AI)
Question: Could you elaborate on the expected AI capabilities, particularly in terms of automatic feature selection, anomaly detection, or predictive modeling, and how these insights will be utilized to drive decision-making within the University?

The University is always looking for more leading/predictive indicators of students at risk of not continuing with the University. As an example, the University would benefit from combining data points from CRM, learning management system, degree planning tools and other student support applications to be more proactive with student interventions that would increase student graduation rates. CMU believes AI can help identify leading and predictive indicators of students becoming at-risk as one example.

32. Has CMU identified a budget for this initiative, and if so, is it possible to share? Is there a price above which proposals would not be accepted?

The University is interested in reviewing all responsive proposals received with price proposals developed independent of budgetary constraints.

33. Can CMU provide current state (and near term) systems architecture/diagrams that would be within the scope of this engagement? (from RFP: include but not limited to: HR, Finance, Student Information System (SIS), Customer Relationship Management (CRM), and Learning Management System.)

See Addendum 1-Exhibit 1 for a high-level overview. This high-level system diagram does not represent all systems and data integrations supported by the University, but it provides a good representation of the different types of integrations and applications and how they are managed.
today. The data integration types listed are not intended to be a full data dictionary of the fields in the integration files but are offered to provide some context of the integration type and purpose.

34. Does CMU currently have a Data Strategy, Analytics team(s) in place? Can CMU provide a high-level org chart of the resources, titles within these teams?

There is no available organization chart for the varied resources who contribute to CMU’s data strategy and analysis.

As for a data strategy team, the University is in early stages of establishing a cross departmental data liaison group, for the purpose of reviewing data use across departments and systems. We do not have a dedicated data analytics teams, these needs are met through a collaboration of efforts between IT, IR (Institutional Research), and occasionally other departments.

35. Does CMU currently have an established ‘Cloud Platform’ vendor? (i.e. Azure, AWS, GCP, etc.) If CMU uses a combination of these platforms, could CMU provide a high-level description of how the platforms are leveraged, generally speaking?

See Addendum 1-Exhibit 1 for a high-level overview. The University subscribes to numerous SaaS applications. The cloud platform supported is not a selection criteria for the vendor’s application. The University selects vendors on cababilities including features, security, reliability, and business continuity. However, generally speaking, many of the subscribed to SaaS applications run on AWS.

36. Can you please confirm our assumption that the response is due 11/10. The Schedule of Activities lists a due date of 11/2.

See response to #2.

37. The RFP references openness to CMU owning their instance of the cloud as well as working within the vendor’s instance. Is there a preference?

If CMU is interpreting the question correctly, and it pertains to if the cloud platform is licensed through the Offeror or licensed separately, the University has the preference to license the cloud platform through the Offeror as a turnkey solution.

38. What is the potential SaaS based ERP that would be integrated with the new/proposed Data Management Platform?

There are several SaaS ERP vendors competing in the market today, including Ellucian, Oracle, Workday, Jenzabar, etc., as well as other business applications such as Paycom. The University will not be making a decision on its SaaS ERP vendor until summer, early fall 2024. CMU is interested in a data management solution that will work with any SaaS application.

39. Does CMU consider both Data Management Platform Strategy and Implementation in single phase as part of one Engagement / Statement of Work?

The RFP statement of work was written to have vendors respond with their strengths. CMU is open to a single solution if the vendor can provide both a data hub and data store for analytics or two solutions if the University is required to leverage more than one solution to meet its project objectives. Either way, the vendor(s) would be part of developing the strategy as part of implementing their Solution. However, if the University identifies through evaluation of responses
that there is an advantage for a separate strategy consultant engagement, CMU will leverage a strategy consultant if it is in the best interest of the project.

40. Can we provide references of our similar engagements in other industries and/or outside Higher Education and outside U.S.A?

Yes.

41. What is the current Architecture in terms of interoperability among several/existing systems in the present ecosystem?

See response #33.

42. Do you have any existing Data Warehouse that is currently being used by CMU?

CMU does not have a data warehouse. Reporting is performed from data stored in Ellucian Banner tables, Ellucian’s Operation Data Store, and data file shares either on-prem or on sharepoint.

43. Are you looking at the potential Data Platform be hosted on-premises or Cloud, if cloud implementation, what is the preferred cloud?

The University takes a cloud-first approach to vendor selection. However, if the University identifies an advantage to an on-prem implementation, the solution will be considered. CMU does not have a preferred cloud platform at this time.

44. Please share the existing technology landscape and current IT architecture - to better understand current data management systems?

See response #33.

   a. Do you have a metadata information document (data dictionaries, data table structure etc.) available for existing source systems?

Only for Ellucian ODS. We have an online metadata dictionary for Ellucian ODS. However, it is internal facing only, is very vast, and requires complex drilling down to exhaustively review all views and definitions. There is no quick, easy, or straightforward way to summarize or capture this information. Link is found here: All ODS Meta Data (coloradomesa.edu)

45. Please provide us the below details for each of the scoped source system & version

   a. Existing Applications (As per RFP, existing application mentioned, Banner, Ellucian Operational Data Store, Slate CRM, CUPA data files)
   b. Platform/ OS
   c. Number of Tables
   d. Number of attributes needs to be considered for the Data Warehouse
   e. What is the database size (data and Index)
   f. In case of Data files - # of Files and Format of Data

Please see Appendix A and Addendum 1-Exhibit 1. Most applications are SaaS.

46. Do you get data from any external source or agency as well? If yes, can you please share a list with names and the kind of data procured?
CMU purchases prospective student lists. These data are imported into Slate CRM.

47. As per RFP, need to migrate to SAAS HR and Finance system..Please confirm history data requirement and how many years of history data to be migrated in proposed solution?

This remains to be determined, and will be addressed and defined when CMU develops a separate HR/Finance SaaS RFP at a future date.

48. What is the current data volume and what is the growth rate expected?

The University currently stores approximately 482,000 student and employee records within its ERP/Human Resources and Student Information System. Approximately 2,500 unique student and employee records are created each year. The 2,500 records do not include perspective student data that is collected in CMU’s Admissions CRM. The database sizes that are known are included in Appendix A. Most SaaS applications subscribed to by the University do not charge by data stored and the size of the data store or growth rate of the data collected in those systems is not known.

49. What is the Life cycle of the data process and delta size of the records (daily, weekly and monthly)?

See response # 48. The University is required to store student academic records for 75 years, financial records for 7 years, personnel records for 10 Years after termed date.

50. Are there any data governance policies or standards that need to be followed during data ingestion?

Ideally, the data governance policies of the source data would be applied of user access and if they have read or read/write permissions.

51. Are there data validation rules that need to be applied during ingestion to ensure data integrity?

Yes.

52. Do you have specified data quality business rules?

No.

53. Are there any data privacy or compliance requirements that need to be considered during the data ingestion process?

The guiding primary data privacy requirement that the University employs is FERPA (Family Educational Rights and Privacy Act). CMU is also subject to the Gramm-Leach-Bliley Act for data privacy and safeguards for non-banking financial instituions, and other privacy laws such as General Data Protection Regulation (GDPR) for international students.

54. Who will provide the standard libraries for names and who will take the call on data anomaly/incompleteness as a part of data profiling?

The University’s is the data custodian of the source system.
55. Do we have any correct data or 3rd party data to update the customer details like address, email, phone number (enrichment)?

No.

56. When multiple records of the same customer are identified, will there be any merging of records who form a golden records?

Yes. The University sees this as a critical component of the implementation phase.

57. Please confirm the number of Key Performance Indicators & Reports count that DSTA would like to get developed in existing and future dashboards?

a. Standard Scheduled Reports
b. Semi- Analytical Reports
c. Highly-Analytical Reports

The University looks to Offerors to present options for best practice KPI reports and analytics used by other Higher Education institutions. CMU does not have a preset number of reports required as deliverables for this project, but rather will look to recommendations and corresponding pricing models for the proposed reports.

58. What is the acceptable latency between the data output and the data display on the dashboard for real time data?

The University feels the more relevant issue is how rapidly the underlying source system performs. If things change slowly in the source system, having fast refresh rate isn’t terribly useful. Acceptable latency between data output and any data display should be < 2 seconds.

59. What options are required for External users to access reports (eg - Email/online access)?

Public information dashboards are displayed through a website. CMU prohibits emailing reports externally that include unit level data.

60. What are the different API integrations envisioned in the new proposed solution?

See response #33 and the overview diagram provided with Addendum 1-Exhibit 1.

61. Please elaborate Analytics use cases, their count and Key Performance indicators?

See response #57.

62. How many users are anticipated to use this platform and expected concurrency?

The only metrics that CMU has to provide is the number of Cognos report writers (22) and report viewers (250). The estimated maximum number of concurrent report writers is 5. CMU has 3 Institutional Research (IR) staff members and 2-3 primary report creators outside of IR.

63. Please confirm technology preference for Enterprise Data Management, Data Store and Analytics Solution?

Cloud delivered. See response #43.
64. Can we showcase references of similar projects from BFSI domain and Enterprise clients?

Yes.

65. What is the planned budget/upper limit for this project?

See response to #32.

66. The Template Contract included in the documentation is a professional services agreement and not a software license agreement - which is what we use. Is the expectation that we use the agreement you sent along with our software license agreement or solely the contract template you sent?

_The State Model contract is the master document with any EULAs or other software agreements to be incorporated as exhibits. All exceptions to any portions of the model contract are to be submitted as a separate document titled Exceptions to Contract Terms. Refer to Section 1: Administrative Information #23. Standard Contract._

67. The RFP specifically asks for resumes of specific team members - to clarify, is that a typical professional resume or are you just wanting a brief summary of qualifications and specifically how that individual would support this implementation?

_CMU prefers the resumes of the team members that will be assigned to support the project. However, the University understands that this is not always possible and will accept a typical team member resume or a qualification summary and how they would support the project._

68. The question: "Describe how the product supports interactive capabilities: (1) Visual selection (brushing, lasso, range, line or similar), (2) Toggling between value and percentage in charts, and (3) Visual custom grouping (for use as a new dimension, filter or within a hierarchy)." - can you please clarify what you envision the end-user experience to be?

_CMU's understanding of the data store for analytics market is that various products have built-in capabilities for data visualization tools or provide licenses work with third-party analytics and visualization platforms. CMU is interested in understanding the Offeror's solutions capabilities, and specifically if the proposed solution will provide interactive dashboards, etc., vs static reports._

69. The question: "Describe how changes to the analytical data models are version controlled? Is this functionality built into the product, or do customers have to do this on their own?" - can you clarify what you mean by "analytical data model?" i.e is that referring specifically about AI/ML capabilities as an example?

_CMU defines an analytic data model as a data set defined from multiple sources where business logic or rules have been applied. Data models are more expansive than traditional data marts. Data models are built to not only answer immediate questions but answer future questions. If an analyst is experimenting or modifies an existing analytic data model, is a copy required or can there be an extension of that model and capabilities manage versions._

70. Do you currently have a Data Governance Plan in place?

_No. CMU is currently working on its data governance protocols and is interested in the data governance technical controls that can be leveraged from this project._
71. Briefly describe current reporting and analytics platform related to Banner, Ellucian Slate and CUPA. Will any of these users be forecasted to use Data Lakes/Data Warehouse from RFP. If so, please provide user count.

See response #33 and Addendum 1-Exhibit 1. CMU’s current reporting tools include Cognos, WebFocus, PowerBI, Tableau, and IBM SPSS and run off data stored in Ellucian Banner tables, Ellucian’s Operation Data Store, or data file shares either on-prem or on sharepoint. The CUPA data is currently downloaded and available via M365 file share as shown in Addendum 1-Exhibit 1. The goal would be for all data analytic workloads to use a data lake/data warehouse moving forward.

For user count information, please see response #62.

72. Do you have currently data lakes or data warehouse that will be replaced with this project? If so, please provide a brief write up of current environment(s) and number users (not included in question above).

No.

73. Are there any new users of analytics and reporting capabilities related to this project (not included in previous 2 questions).

CMU expects this project will expand data analytics and reporting use across business units. However, the growth in the number of dashboard and report creators will be limited and the University sees more growth in consumers of built dashboards and reports.

74. Have you identified initial data sets for Data Management Strategy (i.e., Employee, Student, COA)? If so, please provide metric count for each data set and related number of hierarchies.

CMU has identified the initial data sets as part of the initial systems to integrate at go-live to include Banner ERP, Ellucian ODS, Slate CRM and CUPA data files.

75. Confirm data sources for First-Level Business Use Case:
   a. Student Success – Banner – Student module
      CMU would expect this model to include Banner Student and Slate CRM (Admissions and Student Success) data
   b. Staffing and compensation model – Banner – HR
      CMU would expect this model to include Banner HR, Finance and Operational Data Store data as well as an import of the College and University Professional Association for Human Resources (CUPA) data files.
   c. Census and End-of-Term
      CMU would expect this model to include Banner Student and Slate CRM (Admissions and Student Success) data

The University identified a preliminary set of first level business use cases without knowledge of the proposed solutions capabilities and/or the vendors’ expertise to be brought to the project. The University is interested to dive deeper into these first-level business cases the initial project phase to meet the University’s objectives and realize value at go-live.

76. Would CMU consider extending the due date to November 17, 2023?
77. What are the current data sources for HR and Finance?

*Banner HR and Finance modules.*

78. What is the expected timeline for implementation of these new data sources?

*The projected project go-live is July 1, 2024 with existing data sources.*

79. Is the goal to implement with the current HR and Finance data sources?

*Correct. The University migrating to a SaaS HR and Finance system would not occur until after July 2024 and more likely over an implementation schedule in 2025.*

80. In review of the RFP, we request a 2-week extension in order to provide a comprehensive, detailed and meaningful response with our recommended approach for CMU.

*See response to #2.*

81. Does CMU have high-level architecture diagrams to share, to supplement Appendix A’s narrative of systems used?

*See response #33 and Addendum 1-Exhibit 1.*

82. Does CMU have a preferred procurement vehicle or partner for purchasing software and technology?

*No.*

83. Has CMU already identified any key use cases for AI or Machine Learning as of now or will these be areas for advisory and exploration going forward?

*CMU looks forward to developing AI or Machine Learning as we move forward. However, please see responses #19 and #31.*

84. Are there any specific AI solution requirements that are deemed important for this scope and go live timeframe?

*No specific AI requirements established for deliverables at go live although the expectation is the selected Solution will provide this capability moving forward.*

85. Is it sufficient that your Partner assists you to build the vision / strategy and that the Data Management and Data Store platform supports AI / ML for future initiatives that may arise with longer term transformation efforts?

*CMU looks to Offerors to provide the deliverables outlined in the RFP, to include a developed data management strategy, integration with the four systems mentioned, and delivering identified business use cases. The expectation is that the strategy platform and data store will be built by the (non-CMU) resources identified in the Offeror proposal as part of project completion.*
86. Please further define your goals around the data governance initiative. Do you intend to implement a complete data governance process and software solution which would include scanning data sources, lineage etc. in addition to the people and process side?

See response #15 and #70.

87. Will all work be done remotely or on site or a combination of both?

CMU is comfortable working collaboratively with vendors remotely. Unless the Offeror’s recommended approach to implementation includes on site support, the University is comfortable with all services being performed remotely.

88. How many total records do you have across your source systems like Banner HR/Finance/SIS that would need golden records created in the master data management solution? What is the anticipated growth rate of new records per year that would need master data management?

See response #48.

89. How many named end users will need access to the data integration and analytics platforms?

See response #62.

90. Do you have any existing APIs or web services that can be leveraged for real-time integrations? Which of your systems have the capability to integrate via APIs vs batch ETL processes? Are you looking for a software solution for API integration or do you intend to utilize the existing product?

See Addendum 1-Exhibit 1. CMU currently leverages Ellucian Ethos APIs and Banner APIs. The University would like to move more of our flat file integrations to use APIs but growth in this area is dependent on the various application providers and their capabilities. The University also realizes that in some situations a nightly file batch load is sufficient to meet our needs. CMU is comfortable using existing API and web service integrations it has developed but anticipates that additional integration tools or the extension of existing tools would benefit the project.

91. Beyond the priority go-live deliverables that are listed in the RFP, should what are the next set of deliverables that should we plan for from a pricing perspective?

CMU can only commit to professional services under the written Statement of Work. CMU’s objective with this RFP is for the vendor to assist the University to meet its outlined integrations and first level business use cases for go-live and to be trained on the system to be able to extend its use moving forward. Adding professional services beyond go-live would require additional budget approval.
92. Do you intend to procure our recommended software products directly from the software vendor or should we include those costs as part of our pricing proposal?

All project costs, including software, must be included in the pricing proposal. Third-party software or services the University will be required to purchase outside the scope of the RFP must be identified per the Statement of Work.
1. Student & Application Data (Nightly / On-demand)
2. Student ID (Nightly / On-demand)
3. Student Course Enrollment & Completed Grade Data (Nightly)
4. Housing Deposit, Room Assignment, Room Charges, & Housing Application Data (Nightly)
5. Housing Deposit Paid Amount (Near Real-time)
6. Form PDF & Index Information (On file creation, 3x per day)
7. Course and Financial Aid Data (On demand, e-form request)
8. Course Grades (Near Real-time)
9. Student/Employee ID, User Role, Course, & Student Records outside of Slate load (Near Real-time)
10. Email Address & D2L ID (Near Real-time)
11. Network Account Activation Link (Nightly)