Stevens Institute of Technology

School of Business

**AACSB
ASSURANCE OF LEARNING**

**Master of Science in**

**Business Intelligence
and Analytics**

 **(BI&A)**

**LEARNING GOAL # 4**

**Students are able to discover, access and assess internal and external data sources and frame questions thatare appropriate for solving business problems. [Morabito & Stohr]**

**Responsibility: Joseph Morabito & Ted Stohr**

March 2022

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# 1. INTRODUCTION: LEARNING GOAL BI&A #4

*Students are able to discover, access and assess internal and external data sources and frame questions that are appropriate for solving business problems.*

This goal is assessed in MIS 633 Data Integration and Business Intelligence – a required course in the BI&A curriculum.

This goal is assessed in the final project for MIS 633. This learning goal requires students to think analytically and complete a BI design project, end-to-end. A key part of this project is the discovery of data necessary to develop corresponding data visualizations. An lead-up project is to develop a dimensional model using advanced techniques.

# 2. LEARNING OBJECTIVES AND TRAITS

|  |  |
| --- | --- |
|   | **BI&A Learning Goal - 4: Objectives and Traits** |
| BIA 4 | Students are able to discover, access and assess internal and external data sources that are appropriate for solving business problems.  |
| **Learning Objectives** |  |
| **Objective 1:** | *Students exploit technical systems to identify, locate, access and assess data* |
| **Traits** |   |
| Trait 1: | Students navigate government, organizational, and public web sites to search and access data.  |
| Trait 2: | Students conduct a data audit, including the analysis of existing queries, reports, and systems.  |
| Trait 3: | Students design enterprise repositories with enterprise meta-data. |
| **Objective 2:** | *Students exploit organizational/social systems to identify, locate, access and assess data* |
| **Traits** |   |
| Trait 1: | Students extract data requirements from structured interviews with IT and business analysts. |
| Trait 2: | Students build dimensional data models of business intelligence requirements. |
| Trait 3: | Students design data transform rules to get data into a usable state. |

# 3. RUBRICS

**Objective 1:** Students use analytical methods to find solutions for business problems that involve large and heterogeneous data sets.

|  |  |
| --- | --- |
|   | **BI&A LEARNING GOAL - 4: RUBRIC 1** |
| **BIA 4** | Students are able to discover, access and assess internal and external data sources that are appropriate for solving business problems. |
| **Objective 1** | *Students exploit technical systems to identify, locate, access and assess data* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** | **0** | **5** | **10** |  |
| Trait 1: | Students navigate government, organizational, and public web sites to search and access data.  | Cannot understand or navigate. | Understands and navigates | Easily navigates and associates data. |   |
| Trait 2: | Students conduct a data audit, including the analysis of existing queries, reports, and systems. | Cannot conduct data audit. | Conduct data audit | Conducts data audit and is able to associate data |   |
| Trait 3: | Students design enterprise repositories with enterprise meta-data. | Cannot design meta-data | Designs enterprise meta-data repository. | Designs enterprise meta-data repository and integrates with BI systems. |   |
| **Criterion:** |  |   |   |   |   |

**Criterion: Does not meet expectations: 0; Meets: 5; Exceeds: 10**

|  |  |
| --- | --- |
|   | **BI&A LEARNING GOAL - 4: RUBRIC 2** |
| **BIA 4** | Students are able to discover, assess and access internal and external data sources that are appropriate for solving business problems.  |
| **Objective 2** | *Students exploit organizational/social systems to identify, locate, access and assess data* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** | **0** | **5** | **10** |  |
| Trait 1: | Students extract data requirements from structured interviews with IT and business analysts. | Cannot identify data requirements from interviews | Identifies data requirements from interviews | Identifies and integrates data requirements from interviews |   |
| Trait 2: | Students build dimensional data models of business intelligence requirements. | Cannot build data model. | Builds data model. | Builds data models with advanced techniques for complex requirements. |   |
| Trait 3: | Students design data transform rules to get data into a usable state. | Cannot design transform rules. | Designs transform rules. | Designs complex transform rules. |   |

**Criterion: Does not meet expectations: 0; Meets: 5; Exceeds: 10**

# 4. ASSESSMENT PROCESS

|  |  |  |
| --- | --- | --- |
| **Where and when measured?** | **How measured?** | **Criterion** |
| Course-embedded assignment and project in required course *MIS 633. A*ssessed in the fall and spring semester each year. | Description: assignments and project are graded by course owners and aggregated to obtain a total score.Sampling: All students in the BI&A program are assessed. | 85% of students get a grade of GOOD or better as measured by the rubric for this learning goal |

# 5. RESULTS OF LEARNING GOAL ASSESSMENT - INTRODUCTION

The results of the initial learning goal assessments carried out to date are included below.

**Explanation**

Each learning goal has a number of learning objectives and performance on each objective is measured using a rubric that in turn contains a number of desired “traits”. Students are scored individually on each trait.

The grading sheets for each student are used to develop a Summary Results Sheet for each learning goal objective. A selection of these Summaries is included below.

The first table in the Summary Results Sheet for a learning objective and trait gives the counts of students falling in each of the three categories:

- Does not meet expectations
- Meets expectations
- Exceeds expectations

The right-hand column in the table is used to record the average score of the students on each trait. This table provides an indication of the relative performance of students on each trait.

The second table on each sheet provides the counts of students who fall in each of the above three categories for the overall learning objective.

The person doing the assessment provides explanatory comments and recommendations on the bottom of the Results Summary Sheet. The recommendations improve content or pedagogy changes for the next time the course is given.

# 6. RESULTS OF ASSESSMENT: Fall 2021

**LEARNING GOAL # 4: Students are able to discover, assess and access internal and external data sources that are appropriate for solving business problems.**

**LEARNING OBJECTIVE # 1: Students exploit technical systems to identify, locate, access and assess data**

**ASSESSMENT DATE: ASSESSOR: Joseph Morabito**

**NO. OF STUDENTS TESTED: 43 COURSE: MIS 633**

|  |  |  |
| --- | --- | --- |
|  | **Number of Students** |  |
| **Learning Goal Traits** | **Not Meet Expectat-ions** | **Meet Expectat-ions** | **Exceed Expectat-ions** | **Avg. Grade on Trait** |
| Students navigate government, organizational, and public web sites to search and access data. | 7 | 0 | 36 | 8.37 |
| Students conduct a data audit, including the analysis of existing queries, reports, and systems. | 0 | 7 | 36 | 9.18 |
| Students design enterprise repositories with enterprise meta-data. | 0 | 7 | 36 | 9.18 |
| **Average Grade (Maximum 10)** | **8.91** |

Does not meet expectations 0; meets 5; exceeds 10

|  |  |  |  |
| --- | --- | --- | --- |
| **Total Students by Category**(Based on Average score across all traits) | **Not meet expectations** | **Meet Expectations** | **Exceed Expectations** |
|  | **0** | **7** | **36** |

**COMMENTS:** Most students were able to search and exploit data to support their project; in particular, data visualizations. One group had difficulty discovering necessary data, though they met expectations for the project as a whole.

**REMEDIAL ACTIONS:**

* The instructor will intercede early during the data discovery phase of the project and assist the students.

**LEARNING GOAL # 4: Students are able to discover, assess and access internal and external data sources that are appropriate for solving business problems.**

**LEARNING OBJECTIVE # 2: Students exploit organizational/social systems to identify, locate, access and assess data**

**ASSESSMENT DATE: ASSESSOR: Joseph Morabito**

**NO. OF STUDENTS TESTED: 43 COURSE: MIS 633**

|  |  |  |
| --- | --- | --- |
|  | **Number of Students** |  |
| **Learning Goal Traits** | **Not Meet Expectat-ions** | **Meet Expectat-ions** | **Exceed Expectat-ions** | **Avg. Grade on Trait** |
| Students extract data requirements from structured interviews with IT and business analysts. | 2 | 2 | 39 | 9.30 |
| Students build dimensional data models of business intelligence requirements. | 2 | 2 | 39 | 9.30 |
| Students design data transform rules to get data into a usable state.. | 0 | 0 | 43 | 10.00 |
| **Average Grade (Maximum 10)** | **9.53** |

Does not meet expectations 0; meets 5; exceeds 10

|  |  |  |  |
| --- | --- | --- | --- |
| **Total Students by Category**(Based on Average score across all traits) | **Not meet expectations** | **Meet Expectations** | **Exceed Expectations** |
|  | **2** | **2** | **39** |

**COMMENTS:** Most students were able to successfully develop a multi-dimensional model using advanced techniques. A small number of students had difficulty exploiting advanced techniques.

**REMEDIAL ACTIONS:**

* The instructor will further review examples on the use of advanced techniques in multi-dimensional modeling.

# 7. OUTCOMES: BIA LEARNING GOAL # 4 AFTER ROUNDS OF ASSESSMENT

**After First Round Review Fall 2021**

**Observations:**

**The students performed better on the second learning objective than the first. This may be accounted for because the second objective involved data modeling, which most (if not all) students were exposed to during the first data course, MIS 631.**

**Remedial Actions**

**We plan to intervene early in the semester to assess how the students are progressing in discovering the necessary data for the first learning objective.**

The following table shows the average scores on each goal objective over time.

|  |  |
| --- | --- |
|  | Objective 1 |
| Fall 2021 | **36 (83.7%) Exceed Expectations; 100% Meet or Exceed Expectations** |
|  | Objective 2 |
| Fall 2021 | **41 (95%) Meet or Exceed Expectations** |
|  |  |

# 8. CLOSE LOOP PROCESS – CONTINUOUS IMPROVEMENT RECORD

**Assurance of Learning**

**Assessment/Outcome Analysis**

**Close Loop Process - Continuous Improvement Record**

**Program:** Master of Science in Business Intelligence & Analytics

**Goal 4:** Students are able to discover, assess and access internal and external data sources that are appropriate for solving business problems.

**Goal Owner:** Joseph Morabito and Ted Stohr

**Where Measured:** Course-embedded assignment and project in required course **MIS 633** *Data Integration and Business Intelligence*. Assessed in the fall and spring (if class is offered) semester each year.

**How Measured:** Description: assignments and project are graded by course owners and aggregated to obtain a total score.

Sampling: All students in the course are assessed.

**Closing the Loop: Actions taken on specific objectives**

|  |  |
| --- | --- |
| **Objective 1** | *Students exploit technical systems to identify, locate, access and assess data* |
| **When Assessed:** | *Fall 2021:* |
| **Remedial Action** | *-* The instructor will intercede early during the data discovery phase of the project and assist the students. |
| **Outcome from previous assessment:** | *- None* |
| **Objective 2** | *Students exploit organizational/social systems to identify, locate, access and assess data* |
| **When Assessed:** | *Fall 2021:* |
| **Remedial Action** | *-* The instructor will further review examples on the use of advanced techniques in multi-dimensional modeling. |

# APPENDIX A

**Assessment Exercise: Final Project**

The main evaluation of this goal is based on a final group project. The main objective of the project is to create a framework for large scale development of a BI systems for a company the team selects. Students are expected to use a variety of techniques reviewed in class.

The final report includes the following sections:

* Class Presentation:
	+ Domain, organization, or area of application
	+ Problem
* Framework: solution proposed
	+ Organizational matrices and design artifacts
* Data visualization using an OLAP tool, such as Tableau
* Conclusions: Lessons learned