Stevens Institute of Technology

School of Business

**AACSB  
ASSURANCE OF LEARNING**

**Master of Science in Information Systems**

**LEARNING GOAL # 4**

**Students can analyze a business situation and design an integrated process and data model to satisfy strategic organizational goals.**

**Responsibility: Ted Stohr**

Note:

Learning goal 4 was assessed continuously (as Learning Goal 5) from spring 2008 through spring 2018 in the course *MIS 710 Process Innovation and Management*. The results of these assessments have been archived.

In this version of Learning Goal #4 the goal objective remains unchanged as doe the rubrics used to assess student performance except that the old *Objective 3 Reengineering Principles* has been dropped because students were uniformly performing well on this objective.

This rubric is used each semester to grade the major individual homework in the course. This homework, the “Reengineering” homework, requires students to redesign a simplified version of a real industry process.

August 23, 2021

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# 1. INTRODUCTION: LEARNING GOAL MIS Goal #4

*Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals*

This goal is assessed in MIS 710 Process Innovation and Management, which is one of the required “integration courses” in the MIS core curriculum. This learning goal requires students to think analytically and to synthesize material from other courses in the curriculum – notably, MIS 631 Data Management and MIS 632 Data Management Lab. Because this is a design exercise, students are required to think creatively.

The assessment exercise requires individual students to take an initial “as-is” process description and to redesign (or “reengineer”) it. A typical assessment exercise is included in Appendix B.

To complete this exercise successfully, students need to master a number of process representation techniques including: process narratives, relationship diagrams, process maps using Business Process Management Notation (BPMN) and entity relationship data models.

Students are assessed on their ability: to use the above tools effectively; relate the goals of the process to organizational goals; develop the conceptual data model for the process; describe the process logic; employ relevant “reengineering principles” and develop the associated job roles.

# 2. LEARNING OBJECTIVES AND TRAITS

|  |  |
| --- | --- |
| **Objective 1:** | *Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals* |
| **Traits** |  |
| Trait 1: | Given an organizational problem statement, the student recognizes appropriate strategic goal(s) |
| Trait 2: | Develops process goals that are relevant to the strategic goal(s) |
| Trait 3: | Provides sound rationale explaining the linkage between the strategic goal and the process goals |
| **Objective 2:** | *The student is able to design a sound "to be" or "should" process map* |
| **Traits** |  |
| Trait 1: | Uses a formal method |
| Trait 2: | The process map is syntactically correct |
| Trait 3: | Given the process goals, the process map is semantically correct |
| Trait 4: | Student correctly identifies the organizational entities that are involved |
| **Objective 3:** | *The student can identify and design the data that is consumed and created by the process* |
| **Traits** |  |
| Trait 1: | Uses formal method (e.g., an entity relationship map) |
| Trait 2: | Student can develop a syntactically correct data model |
| Trait 3: | Given the process requirements, the data model is semantically correct |
| Trait 4: | The data model is appropriately linked to the process |

# 3. RUBRICS

**Objective 1:** *Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Trait** | **Poor** | **Good** | **Excellent** |
|  | **Value** | **0** | **5** | **10** |
| Trait 1: | Given an organizational problem statement, the student recognizes the appropriate strategic organizational goal(s) | Does not mention strategy | Identifies an organizational strategy that is relevant to the process | Identifies one or more appropriate organizational |
| Trait 2: | Develops process goals that are relevant to the strategic goal(s) | Does not mention process goals | Develops at least one process goal | Develops several process goals that are relevant to organization |
| Trait 3: | Presents a sound rationale explaining the linkage between the strategic goal and the process goals | Does not mention strategy | Identifies strategy relevant to process | Develops a convincing argument linking to strategic goals |

**Criterion: Does not meet expectations: 0 – 15; Meets: 16-25 ; Exceeds: 26-30**

**Objective 2:** *The student is able to design a sound "to be" or "should" process map*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Trait** | **Poor** | **Good** | **Excellent** |
|  | **Value** | **0** | **5** | **10** |
| Trait 1: | Uses a formal method | Does not use a formal method | Uses a formal representation | Uses formal representation correctly |
| Trait 2: | The process map is syntactically correct | No process map | Process map is correctly drawn | Process map uses correct semantics |
| Trait 3: | Given the process goals, the process map is semantically correct | Process unrelated to goals | Goals clearly articulated at process level | Task goals specified and articulated with process goals |
| Trait 4: | Student correctly identifies the organizational entities that are involved | Does not identify organizational entities | Correctly identifies organizational entities | Correctly analyzes organizational changes |

**Criterion: Does not meet expectations: 0 – 30; Meets: 31-40 ; Exceeds: 41-50**

**Objective 3:** *The student can identify and design the data that is consumed and created by the process*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Trait** | **Poor** | **Good** | **Excellent** |
|  | **Value** | **0** | **5** | **10** |
| Trait 1: | Uses formal method (e.g., an entity relationship diagram.) | No formal method | Attempts formal model but incorrect syntactically | Correct syntax for established model |
| Trait 2: | Student can develop a correct data model (e.g., an entity relationship map) | No data model | Uses a formal representation | Uses formal representation correctly |
| Trait 3: | The data model is syntactically and semantically correct | Data model is developed | Data model is syntactically correct | Data model is syntactically and semantically correct |
| Trait 4: | The data model is appropriately linked to the process | The data model is not linked to the process | Data model is correctly linked to process | Organizational linkages to data are specified |

**Criterion: Does not meet expectations: 0 – 20; Meets: 20-30 ; Exceeds: 30-40**

# 4. ASSESSMENT PROCESS

|  |  |  |
| --- | --- | --- |
| **Where and when measured?** | **How measured?** | **Criterion** |
| Course-embedded design assignment in required course *MIS 710 Process Innovation and Management* | Sampling: All MIS 710 students from fall and/or spring sections of the course.  Description: MIS 710 instructors grade a reengineering exercise using a rubric (see Appendix A.) | 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:** Each student can analyze a business situation and design an integrated process and data model to satisfy strategic organizational goals.

**LEARNING OBJECTIVE # 1:** Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals.

**ASSESSMENT DATE: Fall, 2021 ASSESSOR: Ted Stohr**

**NO. OF STUDENTS TESTED: 47 COURSE: MIS 710 A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Number of Students** | | |  |
| **Learning Goal Traits** | **Not Meet Expectat-ions** | **Meet Expectat-ions** | **Exceed Expectat-ions** | **Avg. Grade on Trait** |
| 1: Given an organizational problem statement, the student recognizes the appropriate strategic organizational goal(s) | 0 | 34 | 17 | 7.0 |
| 2: Develop Process goals that are relevant to the strategic goal(s) | 0 | 22 | 25 | 6.9 |
| 3: Presents a sound rationale explaining the linkage between strategic goal and the process goals. | 0 | 25 | 20 | 7.4 |
| **Average Grade (Maximum 10)** | | | | **7.1** |

Does not meet expectations 0; meets 5; exceeds 10

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Not meet Expectations** | **Meets Expectations** | **Exceeds Expectations** |
| **Total Students by Category** *(Based on Average score across all traits)* | **1** | **27** | **19** |
| **Students meeting or exceeding expectations:** | | **46** | |

**COMMENTS:**

This goal assesses whether students are aware of the larger organizational context to which processes contribute. Students performed relatively poorly on this objective.

**REMEDIAL ACTIONS:**

Provide more examples and an in-class assignment.

**LEARNING OBJECTIVE # 2:** The student is able to design a sound “to be” or “should” process map

**ASSESSMENT DATE: Fall 2021 ASSESSOR: Ted Stohr**

**NO. OF STUDENTS TESTED: 47 COURSE: MIS 710 A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Number of Students** | | |  |
| **Learning Goal Traits** | **Not Meet Expectat-ions** | **Meet Expectat-ions** | **Exceed Expectat-ions** | **Avg. Grade on Trait** |
| 1: Use of formal method | 0 | 2 | 44 | **9.8** |
| 2: The process map is syntactically correct | 0 | 28 | 18 | **7.0** |
| 3; Given the process goals, the process map is semantically correct | 0 | 31 | 13 | **6.2** |
| 4: Student correctly identifies the organizational entities that are involved | 0 | 25 | 9 | **4.7** |
| **Average Grade (Maximum 10)** | | | | **6.9** |

Does not meet expectations 0; meets 5; exceeds 10

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Not meet Expectations** | **Meets Expectations** | **Exceeds Expectations** |
| **Total Students by Category** *(Based on Average score across all traits)* | **8** | **36** | **3** |
| **Students meeting or exceeding expectations:** | | **39** | |

**COMMENTS:**

Most students use BPMN (a formal method) correctly. They performed poorly om the 4th trait – identifying the interaction of the process with organizational entitities.

**REMEDIAL ACTIONS:**

In future lectures will include an additional in-class exercise to emphasize this point.

**LEARNING OBJECTIVE #3:** The student can identify and design the data that is consumed and created by the process.

**ASSESSMENT DATE: Fall 2021 ASSESSOR: Ted Stohr**

**NO. OF STUDENTS TESTED: COURSE: MIS 710 A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Number of Students** | | |  |
| **Learning Goal Traits** | **Not Meet Expectat-ions** | **Meet Expectat-ions** | **Exceed Expectat-ions** | **Avg. Grade on Trait** |
| **1**: Uses formal method (e.g., an ER map) | 3 | 3 | 41 | 9.4 |
| 2: Student can develop a correct data model (e.g., an entity relationship map) | 3 | 22 | 22 | 7.5 |
| 3: The data model is syntactically and semantically corrected | 2 | 31 | 11 | 6.5 |
| 4: The data model is appropriately linked to the process | 2 | 21 | 21 | 7.5 |
| **Average Grade (Maximum 10)** | | | | **7.3** |

Does not meet expectations 0 - 10; meets 11-20; exceeds 21 - 30

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Not meet Expectations** | **Meets Expectations** | **Exceeds Expectations** |
| **Total Students by Category** *(Based on Average score across all traits)* | 7 | 26 | 14 |
| **Students meeting or exceeding expectations:** | | **40** | |

**COMMENTS:**

The introduction of a lab section in *MIS 631/632 Data Management/Lab* last year has made an immense improvement in student performance on this goal. The majority of students now use a commercial tool (*ERWIN*) and have a much better understanding of database design.

**REMEDIAL ACTIONS:**

**None.**

# 7. SPECIFIC STEPS TAKEN IN FALL 2021

**LEARNING OBJECTIVE # 1: Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals.**

**SPECIFIC STEPS**

1. An in-class exercise requiring students to link strategy and process goals for a hypothetical organization was added to help students use the Balanced Score Card approach to make this linkage. This exercise was administered in session 4 and is worth 1% of the final course grade.

**LEARNING OBJECTIVE # 2: The student is able to design a sound “to be” or “should” process map**

**SPECIFIC STEPS**

1. An in-class exercise in using the more precise BPMN process mapping notation was administered in lecture 9-Process/Workflow Design.

**LEARNING OBJECTIVE # 3: The student can apply process improvement (reengineering) principles to achieve process**

**SPECIFIC STEPS**

1. This requirement was included in the problem statement and the requirement was discussed in class.

**LEARNING OBJECTIVE #4: The student can identify and design the data that is consumed and created by the process.**

**SPECIFIC STEPS TAKEN IN FALL-SPRING 2008-09**

1. A revised version of the MIS 630 course was taught for the first time in fall 2008. As a result, the data modeling skills of our students should be improved. It is still the case that some students in some majors will not taken MIS 630 before taking MIS 710.

# 8. CLOSE-THE-LOOP PROCESS - CONTINUOUS MPROVEMENT RECORD

**Program:** Master of Science in Information Systems

**Goal 4:** Students can analyze a business situation and design an integrated process and data model to satisfy strategic organizational goals.

**Goal Owner:** Ted Stohr

**Where Measured:** Course-embedded design assignment in required course MIS 710 Process Innovation and Management

**How Measured:** Sampling: Random samples of 30 MIS 710 students from fall and spring sections of course.

**Description:** One or more MIS 710 instructors grade a reengineering exercise, which requires students to submit a completely new design for a given process.

**Summary Record of Assessments on each Goal 4 Objective**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Objective 1**  **Design Goals** | **Objective 2**  **Process Map** | **Objective 3**  **Data Model** |
| Fall 2021 | 7.0 | 6.9 | 7.3 |
|  |  |  |  |
|  |  |  |  |

**CLOSING THE LOOP PERFORMANCE WILL BE ASSESSED IN SPRING 2022 BASED ON THE CHANGES MADE AFTER THE FALL 2021 ASSESMENTS.**

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

|  |  |
| --- | --- |
| **Objective 1** | *Students can recognize strategic organizational goals and develop process goals that satisfy one or more strategic goals.* |
| **When Assessed:** | *Fall 2021* |
| **Remedial**  **Actions** | Provide more examples and an in-class assignment. |
| **Outcomes from assessments:** |  |
| **Objective 2** | *The student is able to design a sound “to be” or “should” process map* |
| **When Assessed:** | *Fall 2021* |
| **Remedial**  **Actions** | In future lectures will include an additional in-class exercise to emphasize this point. |
| **Outcomes from Assessments** |  |
| **Objective 3** | *The student can identify and design the data that is consumed and created by the process.* |
| **When Assessed:** | *Fall 2021* |
| **Remedial Actions** | **None.** |
|  | **SUMMARY: OUTCOMES FROM ASSESSMENTS** |
| **Outcomes from Assessments** |  |

# The following chart provides an overview of student performance on all three objectives in fall 2021 as measured by *Percent of Students Meeting or Exceeding Expectations* on each of the four objectives.

**Figure: Percent of students meeting or exceeding expectations on the four objectives of MIS goal 4 in fall 2021.**

(Figure goes here)

**APPENDIX A**

**Assessment Rubric**

(This rubric is also used to assess other aspects of process redesign that are not assessed as part of the 4 objectives for MIS Learning Goal 4.)

**Reengineering Homework**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |
| --- | --- | --- | --- |
| **#1 Strategic Organizational & Process Goals** | **Poor** | **Good** | **Great** |
| 1: Appropriate strategic organizational goal(s) |  |  |  |
| 2: Appropriate process goals | **OBJECTIVE 1** | | |
| 3: Valid linkage between strategic & process goals. |  |  |  |
| **#2 Functional View** | **Poor** | **Good** | **Great** |
| 1. Narrative of to-be process clear & complete |  |  |  |
| 2. Functionality adequately described |  |  |  |
| 3. Change levers (structure, human, info, tool) |  |  |  |
| **#3 Relationship Map** | **Poor** | **Good** | **Great** |
| 1. Input-output relationships between departments |  |  |  |
| **#2: Process Map** | **Poor** | **Good** | **Great** |
| 1: Use of formal method (e.g., EPC or BPMN) |  |  |  |
| 2: Process map is syntactically correct | **OBJECTIVE 2** | | |
| 3. Process map is logically sound & complete |  |  |  |
| 4: System & technical entities identified |  |  |  |
| **#3: Apply Reengineering Principles** | **Poor** | **Good** | **Great** |
| 1: Identifies one or more process improvement (reengineering) principles |  |  |  |
| 2: Applies the reengineering principles correctly | **OBJECTIVE 3** | | |
| 3. Explanation of how principles are applied |  |  |  |
| **#4 Data Model** | **Poor** | **Good** | **Great** |
| 1. Use of formal method (e.g., ERD, UML) |  |  |  |
| 2: Data model syntactically & semantically correct | **OBJECTIVE 4** | | |
| 3: Data model covers all relevant data |  |  |  |
| 4: Data model relevant to process requirements |  |  |  |
| **#5 Information Requirements and Reports** | **Poor** | **Good** | **Great** |
| 1. System inputs identified |  |  |  |
| 2. System outputs for decision makers identified |  |  |  |
| **#6 Organization and Job Design** | **Poor** | **Good** | **Great** |
| 1. New goals identified for each function |  |  |  |
| 2. New job roles and objectives identified |  |  |  |
| 3. At least one job design completed |  |  |  |
| **#7 Cost-Benefit Analysis** | **Poor** | **Good** | **Great** |
| **#8 Overall Vision for New Process** | **Poor** | **Good** | **Great** |
| **TOTALS OF ATTRIBUTES** |  |  |  |

**OVERALL COMMENTS**

**Final Grade \_\_\_\_\_\_\_\_ /20**

# APPENDIX B

**Assessment Exercise – Reengineering a Business Process**











