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# Using the IS 2002 Model Curriculum for Mapping an IS Curriculum

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## Abstract

One of the promises of the IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems (Gorgone et al. 2002) is that the model can be implemented at a university without changing IS course structure. That is, to implement the model curriculum does not require a university to teach the eleven courses of the model curriculum. This paper is written to describe a process that attains this goal. In this process, the learning units of the model curriculum are aligned with a university's IS course content. We discuss the detailed process of mapping, and illustrate the use of the better of two mapping approaches tried at the University of South Alabama. Having completed the effort, we can provide IS faculty and department chairs with guidance on what we believe to be an efficient and effective technique for curriculum evaluation and improvement.

**Keywords:** IS2002, curriculum development, curriculum mapping

### 1. INTRODUCTION

Our recent research (Landry, Pardue, and Longenecker 2001) indicates that although 85% of IS faculty surveyed are aware of the existence of the IS model curriculum, only 12% are committed users. However, 61% of respondents agreed or strongly agreed that the use of the model curriculum as a curriculum accreditation criterion would improve their likelihood of using the model curriculum to evaluate their courses and curricula. Now that IS accreditation is a reality (ABET CAC 2002), we believe that more and more institutions will adopt the model curriculum. This paper discusses one such use of the model curriculum which is useful both for course and curriculum improvement, and for preparing for accreditation. This process involves mapping an IS curriculum, as we call it. Despite the fact that curriculum mapping is used in K-12 education, and that it is a fundamental, possible use of the model curriculum, we are aware of no such efforts to publish such an approach to using the IS model curriculum.

### 2. MAPPING AN IS CURRICULUM

By *mapping an IS curriculum*, we mean "the process of identifying and describing how courses that make up an undergraduate IS degree program support the educational goals and objectives embodied in the learning units of the model curriculum." At the University of South Alabama, we have been an enthusiastic proponent of the model curriculum since its inception. As part of the process of preparing for our IS accreditation self-study, we recently decided that documenting the close relationship of our IS pro-

gram with the IS model curriculum would also provide clear-cut, persuasive evidence of the quality of our program. We developed a curriculum mapping process as a result, comparing two alternatives and selecting the most efficient, error-free approach of the two. See Table 1 for an overview of the alternative approaches for mapping an IS curriculum.

| Step | Exhaustive LU Approach | Target Model Course Approach |
|---|---|---|
| Step 1 | Start with the first learning unit in the model curriculum | Start with a course in an IS curriculum |
| Step 2 | Mark all IS courses whose content matches some aspect of the learning unit | Mark all courses in the model curriculum that are candidates for mapping to IS course |
| Step 3 | For each course selected, define a level of depth of coverage | For each course in the model curriculum, select learning units that match IS course objectives |
| Step 4 | Repeat this process for all remaining learning units | Repeat this process for all remaining IS courses |
| Step 5 | Print summary reports | Print summary reports |

**Table 1 - Mapping an IS Curriculum: Two Approaches**

The basic difference between the two approaches is as follows. With the *exhaustive learning unit approach*, each learning unit is visited once, and mapped to all of your IS courses that teach that LU. It is exhaustive, but requires only one pass through the model curriculum. You are required to keep as many local IS courses in mind as possible as you visit and map each LU. In the *target model course* approach, each local IS course is considered one at a time, and you take shortcuts by attempting to look only in those model courses that are thought to map to the local IS course. The approach is simple in that you only have to keep one local IS course in mind while you search the model curriculum for the learning units that map. If you are familiar with the model curriculum, this type of approach might be efficient, because you could know where to look and not look. However, you have to search the model curriculum over and over again for each course that you map.

We found that the exhaustive learning unit approach to be superior to the target model course approach, based on our own trials at mapping our curriculum. The process of exhaustively examining the learning units was more efficient and comprehensive. The target model course approach was unsuccessful. The primary reason was that we did not know where to look. The logical courses in the model curriculum are not intended to match local courses one-to-one, so learning units for any particular local course may be scattered throughout the model curriculum. We took our best guess at where to find learning units, but then, when we finished, we were not sure if we had found all the possible learning units supported by our course. We ended up exhaustively searching the model curriculum anyway. The remainder of the paper will describe the steps of mapping the curriculum in terms of the exhaustive approach.

The first step in mapping one's IS curriculum, using the exhaustive learning unit approach, is to simply make a list of all IS courses. We included both required and elective courses in the computer and information sciences areas. Two of the co-authors performed the mapping exercise due to time pressure. Ideally, the process should have involved faculty who taught the various courses and thereby had the greatest expertise; however, the two faculty members who completed the mapping process were highly expert and familiar with both the local curriculum and the model curriculum. We used a spreadsheet application to

list the courses against the learning units in the curriculum and logically constructed a table consisting of our courses as the columns and the learning units as the rows.

Once courses are listed in some way, the next step is to proceed through the learning units in the model curriculum, mapping each learning unit into every course that covers that learning unit's content. Each cell in our table contained an educational depth level of coverage to which the learning unit was targeted in our course. The depth metric, as defined in the IS model curriculum, is as follows: 1-recognize, 2-differentiate, 3-use, 4-apply. See Figure 1.

| **University of South Alabama - School of CIS** | | | | | | |
|---|---|---|---|---|---|---|
| **Information Systems 2002-03 Curriculum Map** | | | | | | |
| | | | | | | |
| **IS Model Course** | **Learning Unit** | **Learning Unit Name** | **CIS 110** | **CIS 120, 122** | **ISC 350** | **ISC 360** |
| IS.0 | 1 | Systems and IT concepts | 2 | 2 | | |
| IS.0 | 13.04 | Info. Analysis: finding IS/IT requirements | | | 1 | 3 |
| IS.0 | 13.05 | Organizing personal data resources | | | 2 | 1 |
| IS.1 | 12 | Ethics and the IS professional | 1 | | 2 | 2 |
| IS.1 | 5 | Systems and quality | 1 | 1 | 2 | |
| IS.3 | 31 | IS society and Ethics | 1 | | 2 | |

**Figure 1 - Spreadsheet mapping learning units to local courses**

Once all courses have been mapped, the next step is to create aggregate reports that provide information as to strengths and weaknesses of the curriculum vis-à-vis supporting the model curriculum.

One of the advantages of creating such a detailed curriculum map is that it enables a detailed evaluation of one's curriculum against the IS model curriculum. The co-authors prepared a serious of spreadsheet-based reports designed to indicate the breadth and depth of coverage of learning units. For instance, one could show the number of different experiences that a student would have with a single learning unit, or the deepest coverage of a learning unit could be indicated.

At the course level, one can analyze whether or not particular learning units are being covered at the depth required by the model curriculum or by your own local curriculum's intent. By simply documenting learning unit coverage and depth, an IS department is able to objectively critique its program. For example, we could ask the question "should the course ISC 350 should be at a depth of 3 (use) or 4 (apply) for learning unit 13.05 rather than the 2 it is currently?" Some of the specific types of analysis used to prepare our accreditation self-study report included the following:

- MAPPINGS: Two "big maps" – one shows the mapping of LUs to local courses; the second shows highest level achieved for an LU in local curriculum
- SUMMARY VIEW: The second mapping is also a "reality check" – does the mapping make sense when one looks back at all of a student's experiences in the curriculum?

- RANGE OF LOCAL COVERAGE: Because students may choose electives, the totality of experiences may not be the same for all students. Using the mappings of required courses, we can assert what the minimum experiences might be in the curriculum; the mappings of required plus elective courses represents the maximum experience.
- UPDATING THE CURRICULUM: In some instances, we have discovered that elective courses covered a substantial number of learning units, such that they contributed to the local curriculum's coverage of the model curriculum. One elective course was recommended to be changed to a required course because this course "touched" so many of the LUs.

## 3. OBSERVATIONS ABOUT THE PROCESS—NO SHORTCUTS

We found this process of exhaustively examining the learning units to be superior to the target model course approach to mapping an IS curriculum. One pass through the model curriculum's LUs is all that is necessary, if you have all of your local IS courses in mind. The target model course approach was more inefficient and uncertain, and worked more like a hunt-and-peck strategy. It is important to stress that if you recruit individual faculty members to map their courses, inform them that the most efficient way to map a course is to exhaustively search the model curriculum's learning units, starting at the beginning and proceeding through to the end, rather than taking shortcuts.

## 4. CONCLUSIONS

Overall, the mapping process used was efficient and complete, and enabled some insightful analysis of our curriculum through a detailed comparison against the model curriculum. Some of the reports produced from the mapping provided supplemental reports that helped us provide more detail than was required by ABET. We think that the most efficient and error-free process is to look at each learning unit, one at a time, mapping all of the matching courses to that learning unit before moving on. If new courses are added, then do the same thing, start all over again for that course, starting with the first learning unit and going to the last. Although the process requires the cooperation of faculty, and some tedious, thoughtful evaluation, we think that doing it will make further analysis easy, through the use of various views and summary reports. The process as a whole is introspective and useful for curriculum analysis and improvement. Ultimately, we think the process is useful for improving the process of educating our students.

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