Designing an Enterprise Architecture Course for an Information Systems Program

David T. Green
Governors State University, dgreen@govst.edu

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DESIGNING AN ENTERPRISE ARCHITECTURE COURSE FOR AN INFORMATION SYSTEMS PROGRAM

David Green
Division of Accounting, Finance, MIS, & Economics
Governors State University
dgreen@govst.edu

Extended Abstract:
This proposed research will explore the role of Enterprise Architecture in the information systems curriculum. Results are expected to identify common course content, including learning outcomes and topics that may be included in an Enterprise Architecture course in an information systems program.

Keywords: enterprise architecture, curriculum development

I. INTRODUCTION

Enterprise Architecture (EA) has emerged as an important curricular component in information systems programs in both the ACM/AIS undergraduate IS2010 curriculum model and the draft graduate ACM/AIS MSIS 2016 curriculum model (Topi et al., 2010; 2016).

Even so, there is limited guidance on the set of topics, readings, and learning outcomes included in undergraduate and graduate level courses to help faculty member and program leaders create and deliver an EA course. Mathiew and Schell (2011) note that “few universities teach an EA course and no textbook on the topic currently exists.”

This proposed survey research will seek to identify common course content, including learning outcomes and learning activities, that may be included in an Enterprise Architecture course in an information systems program.

II. ENTERPRISE ARCHITECTURE AND INFORMATION SYSTEMS CURRICULA

Enterprise architecture came about “given a need for IT and business alignment” organized along various organizational layers (Meyer & Helfter, 2014). Ross et al. (2006) describe enterprise architecture as “the organizing logic for core business processes and IT infrastructure reflecting the standardization and integration of a company’s operating model.” Given that Business-IT strategy alignment has remained a top CIO concern according to the Society for Information Management’s annual IT Issues and Trends Study since 1980 (Kappelman et al., 2016), a domain, such as enterprise architecture, appears to warranted as it provides a structure for CIO’s to foster alignment.

Enterprise Architecture is included as a core course or competency in both the ACM/AIS undergraduate IS2010 curriculum model (Topi et al., 2010) and proposed in an initial feedback drafts of the MSIS2016 graduate curriculum model (Topi et al., 2016). Topi et al. (2016) explain EA as having two aims: “managing the complexity of information systems and technologies and fit these with the strategy of the organization. The area covers competencies that enable graduates to participate in planning, building, using, maintaining and evaluating the architectures.” Curriculum models provide guidance but translating the model into a course presents challenges without providing additional guidance.

III. RESEARCH QUESTION AND PROPOSED METHODOLOGY

In an attempt to bridge this gap, this study will attempt to identify the following:
1. Program leader familiarity with Enterprise Architecture concepts.
2. EA outcomes included in program-level learning goals or outcomes
3. EA course-level topics, readings, and learning activities
4. EA concept delivery within program curricula

PROGRAM LEADER FAMILIARITY WITH ENTERPRISE ARCHITECTURE CONCEPTS

Familiarity with a concept is necessary before active inclusion of related content in program curricula. With the concept of enterprise architecture, familiarity with EA is necessary before an information systems program leader may actively revise curricula to align the program with EA concepts. Appendix I (3.4; Part 3; and Part 4) includes draft survey language related to familiarity with enterprise architecture concepts.

EA OUTCOMES INCLUDED IN PROGRAM-LEVEL LEARNING GOALS OR OUTCOMES

Degree programs, particularly accredited programs, define program level learning goals or outcomes that are met through a curriculum designed to meet those goals and outcomes (AACSB, 2013). The study will also attempt to address whether EA related learning goals or outcomes are currently included in existing information systems programs.

Sample learning outcomes, topics, and readings are included in the survey based on current IS2010 and MSIS2016 (draft) curriculum models along with collection of five syllabi collected through public web based search engines.

Appendix I (3.7; 3.8; and 3.9) draft survey questions ask participants how well the current undergraduate or graduate programs meet the enterprise architecture related outcomes from the proposed MSIS 2016 model curricula (Topi et al., 2016).

EA COURSE-LEVEL TOPICS, READINGS, AND LEARNING ACTIVITIES

A search for existing publicly available course syllabi resulted in the collection of five syllabi collected through public web based search engines. The initial collection of syllabi included the reading assignments listed in Table 1. The readings range from books to framework related resources. The most common readings across the small sample of syllabus include Ross et al. (2006) and Bernard (2014).

Frameworks, process models, and maturity models are often used to implement and manage Enterprise Architecture (Meyer & Helfert, 2014). Among the small sample of syllabi collected, the Zachman (1987) and TOGAF (The Open Group, 2011) frameworks are the two most commonly included.
Table 1. Common Readings in Enterprise Architecture Courses

<table>
<thead>
<tr>
<th>Model/ Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Open Group (Various Resources)</td>
</tr>
</tbody>
</table>

Table 2. Common Frameworks, Process, and Maturity Models in Enterprise Architecture Courses

<table>
<thead>
<tr>
<th>Model/ Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOGAF Framework (The Open Group, 2011)</td>
</tr>
<tr>
<td>Zachman Framework (Zachman, 1987)</td>
</tr>
<tr>
<td>Other frameworks included with EA by Meyer and Helfert (2014):</td>
</tr>
<tr>
<td>ARIS Framework (Scheer &amp; Nuttgens, 2000)</td>
</tr>
<tr>
<td>COBIT (IT Governance Institute, 2007)</td>
</tr>
<tr>
<td>GERAM Framework (IFIP IFAC Task Force on Architectures for Enterprise Integration, 2003)</td>
</tr>
<tr>
<td>ITIL (Office of the Government Commerce, 2007)</td>
</tr>
</tbody>
</table>

EA CONCEPT DELIVERY WITHIN PROGRAM CURRICULA

Participants will also be asked to provide information about the delivery of existing EA related concepts. Programs already including EA content will be asked to explain the format of the delivery as either stand-alone courses or concepts across one or multiple courses (see Appendix I – Part 4). In addition, participants will be asked to share a copy of a syllabus to provide more detail if they are willing to do so.

PARTICIPANTS, SURVEY DEPLOYMENT AND DATA COLLECTION

Participants will be solicited by email. Target participants include members of the Association for Information Systems (AIS) Special Interest Group on Information Systems (SIGED) members; AIS Special Interest Group on Enterprise Systems (SIGENTSYS); AIS World listserv; and information systems program chairs and coordinators. Participants will be asked to complete an online survey. Information from the sample syllabi and curriculum models were used to develop the survey questions. The initial draft of the survey is included in Appendix 1. The survey includes requests for program/school demographic information; awareness of existing information systems
Identifying Content to Include in an Enterprise Architecture Course

Green

IV. CONCLUSION AND EXPECTED RESULTS

The results of this survey research will help guide information systems program leaders and faculty members with specific direction for common topics, readings and structure for an undergraduate or graduate course in Enterprise Architecture.

V. REFERENCES


Proceedings of the AIS SIGED 2016 Conference

APPENDIX I: DRAFT SURVEY

Enterprise Architecture

1. Enterprise Architecture Familiarity and Curriculum Survey for Information Systems Faculty Members

Participants: Please consider participating in this survey if you currently or recently served in any of the following roles:
- Faculty member in an information systems program (Undergraduate or Master's Level)
- Department Chair for Information Systems
- IS Program Director or Coordinator

Survey Overview:
Interest in Enterprise Architecture has increased over time leading to established frameworks and models.

Enterprise Architecture is included in the ACM/AIS undergraduate IS2010 curriculum model and proposed in an initial feedback drafts of the MSIS2016 graduate curriculum model. Curriculum models provide guidance but translating the model into an actual course presents challenges without additional curriculum guidance.

This survey seeks input on the current familiarity with and use of enterprise architecture content in your undergraduate and graduate information systems curriculum.

Participation in this study is voluntary and optional. If you choose to participate, you may stop the survey at any time. The results of the survey are anonymous and will be presented in summary reports. There are no known risks to you participating in this survey.

If you consent to participate in the survey, please click "Next".
### Enterprise Architecture

#### 2. Demographics

1. What is your role in the information systems program? (Choose all that apply)
   - [ ] Faculty Member Teaching in the Program
   - [ ] Program coordinator/director
   - [ ] Department Chair
   - [ ] Other (please specify)

2. Your school and degree program are primarily focused in what country?

3. In which classification does your institution most closely align?
   - [ ] Doctoral University
   - [ ] Master's College or University
   - [ ] Baccalaureate College
   - [ ] Associate's College (2-Year Degrees)
   - [ ] Other (please specify)
4. Curriculum models for Information Systems -- Please rate how strongly you agree or disagree with the following statements related to curriculum models in information systems.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am aware of the ACM/AIS IS2010 curriculum model</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>My undergraduate program is closely aligned with the ACM/AIS IS2010 curriculum model</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>I am aware of ACM/AIS MSIS2006 curriculum model</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>My graduate program is closely aligned with ACM/AIS MSIS2006</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>I am aware of the draft ACM/AIS MSIS2016 curriculum model</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>My graduate program will align itself with ACM/AIS MSIS2016</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>We use the ACM/AIS Curriculum Models to update and revise curricula</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

5. How many years of experience do you have in academia as part of an information systems program?

- [ ] 0-5
- [ ] 6-10
- [ ] 11-15
- [ ] 15+
Enterprise Architecture

3. Familiarity with Enterprise Architecture

* 6. How strongly do you agree or disagree with the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am familiar with the term &quot;Enterprise Architecture&quot;</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I understand &quot;Enterprise Architecture&quot;</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am able to design a course on &quot;Enterprise Architecture&quot;</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am able to communicate &quot;Enterprise Architecture&quot; concepts to students.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am able to communicate &quot;Enterprise Architecture&quot; concepts to practitioners or other key stakeholders.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am familiar with the Zachman Framework</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am familiar with the TOGAF Model</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have professional work or consulting experience outside academic where &quot;enterprise architecture&quot; concepts were a key component</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I believe Enterprise Architecture concepts should be included in an UNDERGRADUATE Information Systems program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I believe Enterprise Architecture concepts should be included in an UNDERGRADUATE Information Systems program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
7. How well do you believe the following program outcomes are met based on the current curriculum in your UNDERGRADUATE Information Systems program? (If applicable)

<table>
<thead>
<tr>
<th>Outcome is Not Met</th>
<th>Outcome is Partially Met</th>
<th>Outcome is Met</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understanding enterprise architecture principles and the value it provides to businesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Participating in building and maintaining an EA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Communicating and deploying an EA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Using an EA to influence IS/IT related organizational improvement projects</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. How well do you believe the following program outcomes are met based on the current curriculum in your GRADUATE Information Systems program? (If applicable)

<table>
<thead>
<tr>
<th>Outcome is Not Met</th>
<th>Outcome is Partially Met</th>
<th>Outcome is Met</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
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<tr>
<td>4. Using an EA to influence IS/IT related organizational improvement projects</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. If you have other comments about your familiarity with Enterprise Architecture, please add them here.

[Blank space]
10. Which program title of your UNDERGRADUATE 'information systems' related programs most closely resembles your primary degree program title?

- [ ] We have NO undergraduate program in Information Systems
- [ ] Computer Information Systems
- [ ] Information Systems
- [ ] Information Technology
- [ ] Information Technology Management
- [ ] Management Information Systems
- [ ] Information Management
- [ ] Informatics
- [ ] Health Informatics
- [ ] Analytics
- [ ] Business Analytics
- [ ] Business Data Analytics
- [ ] Business Informatics
- [ ] Business Information Systems
- [ ] Business Administration with an IS/IS/CIS or related Concentration
- [ ] Other (please specify)
11. Does your primary UNDERGRADUATE information systems program include enterprise architecture concepts? (Choose all that apply)

- [ ] My undergraduate program **INCLUDES** a stand-alone course titled "Enterprise Architecture"
- [ ] My undergraduate program **DOES NOT** include a stand-alone course titled "Enterprise Architecture"
- [ ] My undergraduate program **includes** "Enterprise Architecture" concepts in one course.
- [ ] My undergraduate program **includes** "Enterprise Architecture" concepts across multiple courses.
- [ ] My undergraduate program **DOES NOT** include any "Enterprise Architecture concepts in any course.

**Other (please specify)**

12. Which degree title of your GRADUATE information systems related programs most closely resembles your program title?

- [ ] We have NO Master’s degree programs in Information Systems
- [ ] Master of Science in Information Systems
- [ ] Master of Science in Management Information Systems
- [ ] Master of Science in Information Management
- [ ] Master of Science in Informatics
- [ ] Master of Science in Health Informatics
- [ ] MBA with MIS/CIS/IS Emphasis
- [ ] Other (please specify)

13. Does your primary GRADUATE (Post-Baccalaureate/ Master’s-level) information systems program include enterprise architecture concepts? (Choose all that apply)

- [ ] My graduate program **INCLUDES** a stand-alone course titled "Enterprise Architecture"
- [ ] My graduate program **DOES NOT** include a stand-alone course titled "Enterprise Architecture"
- [ ] My graduate program **includes** "Enterprise Architecture" concepts in one course.
- [ ] My graduate program **includes** "Enterprise Architecture" concepts across multiple courses.
- [ ] My graduate program **DOES NOT** include any "Enterprise Architecture concepts in any course.

**Other (please specify)**
### Enterprise Architecture

#### 5. Readings & Resources

14. Which of the following EA-Related books; book chapters; articles; or frameworks do you use in your information systems programs (if any)? (Choose all that apply)

- The Open Group (Various Resources)
- Zachman Framework
- TOGAF Framework
- GERAM Framework
- ARIS Framework
- ITIL
- COBIT
- UML
- BPMN
- Other Maturity Models
- None

15. What other books, book chapters, or resources do you include in the curriculum related to “Enterprise Architecture”?

---

This content is extracted from a document related to identifying content to include in an Enterprise Architecture course, which is part of the AIS SIGED 2016 Conference proceedings.
16.
Do you agree graduates of your undergraduate and graduate programs meet the following competencies:

Managing the complexity of information systems and technologies and fit these with the strategy of the organization. Competencies that enable graduates to participate in planning, building, using, maintaining and evaluating the architectures. (Topi et al., 2016)

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Undergraduate Program Meets these competencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My Graduate Program Meets these competencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
17. **Are you willing to share your syllabus?**
If you are willing, please share your "Enterprise Architecture" or related course syllabus that includes course description; expected learning outcomes; readings/resources; learning activities; and course outlines. With your permission, content within your syllabus will be aggregated and summarized with other syllabi submissions. You may submit the URL for the syllabus here, or else email the syllabus as an attachment to dgreen@govst.edu.

18. If you are willing to share your Enterprise Architecture syllabus content, I would like to acknowledge your contribution in any future presentation or publication. Would you prefer to stay anonymous or are you willing to be included in an acknowledgment?

- [ ] I do not have a syllabus to share, or I am not able to share my syllabus at this time.
- [ ] I will share my syllabus, but please keep me anonymous
- [ ] I will share my syllabus, and you may acknowledge my contribution (please share your name and email address for follow-up)

Thank you for your participation in this survey.