REA–Semantic Teaching in the Accounting Information Systems (AIS) Courses

6

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INTRODUCTION

To meet the evident need for accountants that are familiar and understand Accounting Information Systems (AIS), many colleges added AIS courses or updated their current courses. Such a move was supported by accreditation bodies like the Association to Advance Collegiate Schools of Business (AACSB). But despite the agreement of the importance of AIS courses, the addition of AIS topics to the curriculum followed different approaches; some schools have only one AIS course while others may have two or more courses. Furthermore, most of the AIS courses were created with different topics and without any general agreement on the supplemental concepts (Fordham 2005), one may find some courses that focus on AIS security, audit and fraud while other courses give more emphasis on System Development Life Cycle (SDLC) and database design. Thus, textbook authors and publishers became more motivated to introduce textbooks that cover many of the needed skills, but in a format that exceeds what can be covered in one or even two AIS courses.

One of the important topics that most AIS course designs aim to cover is the REA (Resource-Event-Agent) framework that was designed by William McCarthy in 1982, it is widely adopted in AIS curriculum as a methodology to design a relational database, but despite its popularity the complexity of this topic and time limitations make it challenging to many AIS educators to cover such topic along with all the other learning outcomes that the academic programs and job market expect graduates to have. As a result, many AIS educators are facing a dilemma when they are creating or updating their AIS courses to achieve all the required learning outcomes within the allotted course meetings times. The easiest solution to solve this problem would be adding a second or a third AIS course, but that may not be possible nor practical in many cases. Consequently, some AIS educators ended up considering some topics as self-study material. Such an approach may work, but there is a price to be paid, greater preparation time, and student resistance to novel teaching approaches (Herreid and Schiller 2013).

Some attempts were made to address this issue; Seow and Pan (2017) designed an online self-study tutorial to teach REA at the undergraduate level, their online tutorial was designed to supplement class lectures by reinforcing the concept and incorporating practice to assess the student understanding. The online self-study tutorial helps in reducing the time required to teach REA data modeling, but it does not address how to deal with the theoretical part that will take place in the classroom. Textbooks that cover the REA data modeling topic in-depth offer several chapters in this area. For example, Romney and Steinbart (2018) cover REA data modeling in almost four chapters (4, 17, 18 and 19). Therefore, using a traditional approach by covering complete chapter materials may not be practical nor possible. This paper solves this problem by providing all the required knowledge to create an accounting relational

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database in one place. Furthermore, this paper provides a simplified example along each step to help to deploy the illustrated material.

FOCUS OF THE PAPER

This paper complements the Seow and Pan (2017) self-study online tutorial by providing a condensed version of the REA data modeling more from a theoretical perspective. It is designed to provide the basic knowledge required in each step in designing a relational database, accompanied by a simple example to show a possible outcome for that particular step. Furthermore, a clear methodology is provided on how to create a logical system design using a design approach that relies on business knowledge. This paper does not cover the remaining stages of the System Development Life Cycle (SDLC)[1]. This paper can be used as a teaching aid for self-study material, a flipped classroom model or as supplementary material for an adopted textbook.

BACKGROUND

In this section, the basic required theoretical background for students to understand how to design a relational database using REA data modeling is provided. Furthermore, a simplified case study is being discussed along each step.

Preamble

Database design is the process of producing a detailed model of a database. This model contains all the needed parameters to generate a design in a data definition language, which can then be used to create a database at the beginning of its life cycle. The life cycle of any system, often called (SDLC), consists of the following stages:

- **System Analysis:** Represent collecting all the required information and defining the desired outcomes. This stage will produce a document generally known as System Requirements Analysis.
- **Logical design:** In this stage, a blueprint for the system is being created.
- **Physical design:** Translating the blueprint that was created in the previous stage into a software. This phase is also known as coding.
- **Implementation and Conversion:** In this stage, AIS will be deployed, and data will be transferred from the old system to the new system.
- **Operation and Maintenance:** The new system in this stage will be subject to routine testing and maintenance.

Database Design Approaches (Logical Design)

In logical database design, there are two different approaches. One approach is called Normalization, and this refers to the process of structuring data to minimize duplication and inconsistencies. It begins by storing all the data in one large table. After that, several rules will be used to split that large table into several interrelated and normalized tables as part of the database. The Normalization approach can be