

A Forced Paradigm Change

William J. Tastle
tastle@ithaca.edu

Ute H. St.Clair
ustclair@ithaca.edu

School of Business
Ithaca College
Ithaca, NY 14850, USA

Abstract

Business schools that do not have MIS/IS/IT/CIS programs all offer some kind of introductory course in information systems that typically is boring, demoralizing, and avoided by students. As the use of the computer has pervaded all disciplines and has become essentially commoditized, B-schools are being challenged to offer a course that gives students skills that make them productive and give them the knowledge to analyze big data and data from various non-similar courses, perform sophisticated statistical operations, as well as have mastery over the worksheet. Offering a national certification exam can help, but it alone is not sufficient.

Keywords: introductory MIS course, business school technology course, big data, analytics

1. INTRODUCTION

You are forewarned: This is not a traditional paper. In fact, some might say that this is more of a musing than a research paper, to which the authors would be hard-pressed convincingly to deliver a contradictory argument. But it might, nonetheless, find a use in the dust-covered historical archives of information systems curricula in business schools...if nothing more than as a footnote. There are no references, for this is not a scientific study. It is, however, based on many years of research and publications, and the instruction of thousands of students over a 40+ year academic career.

We are part of the leading edge of the baby boomer generation, and share experiences with so many colleagues across the country who either have already retired from the profession or are giving retirement serious consideration. We are the 65+ generation! We were the ones who were present at the advent of the make-it-yourself computer kits, and some of us, we included, have assembled more computers than

purchased the ready-to-use models, consistently having been disappointed with the lack of adaptability of those store-bought computers. We saw the Sinclair with its X80 chip, the Commodore PET and the Tandy TRS-80 that we affectionately nicknamed the "trash-80". Before DOS there was the CP/M operating system (control program for microcomputers), actually a very effective and far superior operating system than DOS. We remember the 8086 chip in computers that were just beginning to be used in business environments, only to have IBM come along and assemble a less capable computer, using the 8088 chip, and the speed of computing dropped a magnitude, or so it seemed at the time.

The first serious involvement of one of us with a computer was with the portable (25 pounds) Osborne 1, a 5¼" dual drive, single-sided floppy disk microcomputer running CP/M and bundled with *free* software (WordStar, SuperCalc and BASIC): "I was working as the COO at a regional museum and used it to create the budget. The CEO, when entering my office unannounced and

seeing me at the computer, was visibly annoyed, so had the budget I created using MultiPlan not been perfect, I might have been dismissed. But I persisted and the computer was there to stay, even though I moved onward and upward."

There were so many varieties of computers including the Apple I, Macintosh, Columbia, etc. Volumes have been written on what has been, and we were a part of it; indeed, staying current in the field was possible...a long time ago.

2. ADVENT COMPUTING AND BUSINESS

With the burgeoning of computers in the business arena it quickly became evident that business schools needed to bring this technology into their curricula, especially in the face of the ever-expanding number of computer science programs that seemed to sprout daily. The computer science programs taught how to program, something that business schools had no interest in duplicating. Business schools saw a need to bring the products that computer science programs were developing into the working environment and **apply** them to problem resolution. Hence was born the field of management information systems, the name given for computers in the workplace.

As MIS curricula were being developed, there seemed to be a need to provide students with a suitable background, and the only background at the time was firmly rooted in the large computer systems that were contained in air-conditioned rooms behind security doors and with backup energy supplies to handle those troublesome power interruptions. So, MIS courses were constructed around these facilities and students learned terminology, esoteric facts, and concepts related to computer usage in major corporations. There was little computing in small- and medium sized companies, and this scarcity was reflected in the curriculum. Unfortunately, not a whole lot has changed with respect to the introductory course in MIS, or IS, in business schools, though there have been exceptions.

3. CURRENT DAY DEMANDS

Fast forward to today. Business schools are still required to teach MIS, if they expect to achieve or retain their AACSB accreditation. Those schools with sufficient financial resources typically have some kind of MIS department, though the designation is likely to be some derivation of other names, such as Information

Systems, Information Technology, or Decision Support. Their initial course is, for the most part, boring and an interest-destroyer for students. If a business school has no information systems program, then this kind of course is typically the most avoided, despised, and morale-destroying course in the B-school. Students wonder, why they are required to master material that will be of benefit to the very, very few hired in corporations with MIS departments. The overwhelming majority of students will move into small and medium sized companies in which their ability to use their computer-based skills will permit them to distinguish themselves from others. And it is at this point that we argue that the traditional curriculum fails even with the addition of "personal" computing to the curriculum!

Arguably, the use of the computer has been commoditized in business. We can debate this point, but we all agree that the computer and its associated usage has pervaded our entire culture. One would be hard-pressed to identify any discipline that is devoid of this technology. Therefore, when we look carefully at the companies to which most of us in B-schools will send our graduates, we must ask, what skills will they need? Everyone can use a word processor, though few use it well. The same can be said for presentation software. The current generation is very knowledgeable in the areas of social media, though the depth of their knowledge is minimal and superficial. They might be the computer generation, but they may more accurately be called the computer *illiterate* generation. They are great gamers, but cannot troubleshoot their own internet connection. When they save a file, it is the operating system that decides its location, only to be lost by the user, because they are unable to make a file structure to organize their data. Of course, there are the statistical outliers who are literate and competent, but they would still be so in the absence of formal instruction.

The stage has now been set for the question to which this paper is directed: What should be the content of a single course for students in B-schools that will be most meaningful for them, give them the greatest benefit in preparing them for their career, master technology skills that can be further enhanced in their remaining courses, and differentiate them from others in the work environment?

4. WHEN THERE IS ONLY ONE COURSE

To our way of thinking, and based on our experience in our little corner of the world, there is one tool that pervades all aspects of business, as well as the non-business world. It is already possessed by most businesses and widely utilized, but at a minimal level of sophistication, and hence its power is greatly underutilized. This technology is the basic spreadsheet! From VisiCalc to Multiplan, from LOTUS to Quattro and now to MS Excel, the spreadsheet has been the most employed, most underutilized, most incorrectly applied, and most maligned of technologies. And yet, employees are in large part judged by their abilities to use this technology creatively to solve increasingly complex problems that have now transcended to the area of big data application, complete with data derived in real time from varying sources (other spreadsheet programs, text files, and database tables from Oracle, SQL, MySQL, and some hundred more DBMS's). For each need there arguably exists some special-purpose tool that will solve that specific problem very nicely. All that is needed is knowledge of the existence of that program, the time and money necessary to master how it is used and then duplicate the effort with the next different problem. Realistically this is a waste of resources, especially in human terms.

The ideal course for business students that gives them technological expertise at a sophisticated level of achievement is built around Excel. Like it or not, it is this product that alone sits on virtually every, with its user being able to apply it to only the simplest of tasks. The Excel models that textbooks use are generally little more than arithmetic operations on cells. The nesting of functions is all but unknown, even though it is with this aspect of Excel that its power permits the user to rise to high levels of accomplishment. Even more significant is the ability to use array functions to create answers for which a novice user would use columns of intermediate (and unnecessary) calculations.

5. CERTIFICATION: A MARK OF DISTINCTION?

Some might argue that students becoming Microsoft Excel certified is a mark of distinction, but even that is suspect. Becoming certified means that one has a good knowledge of the Excel ribbon. Utilizing functions for complex work is noticeably absent from the exam. At our school, we have 100% of our students becoming certified, and that is a nice statement to say and to advertise! But what is more interesting is that

we spend absolutely no time preparing students for that exam! They can teach themselves using a proper textbook augmented by an instruction preparation program like GMatrix. Class time is best spent developing expertise in pivot tables, string manipulations, and learning how to create graphics that create an impression different from what the numbers actually state. This last point was a topic of concern to the legal professors, when told what was being taught. Their concern evaporated, when learning how to manipulate or "cheat" with graphics was explained in the context of how one can know, when these same techniques are used at company presentations, unless one knows what to observe. An analogy can be made concerning computer security: how can someone program a solution to a security break, if one never learns how to break into systems?

The ability to create nested IF's, LOOKUP's - including the INDEX-MATCH combination - logical functions to test for conditions, functions to capture errors, array functions of varying levels of difficulty, table manipulations using the INDIRECT function, named ranges, importing of non-Excel data into the worksheet, and most definitely, how to manipulate text, which requires mastery over the concept of nested functions. But the course cannot end here.

With the advent of big data, data science, and business analytics, a thorough knowledge of Excel is necessary, but not sufficient. The ability to use statistical packages that go beyond Excel is becoming increasingly necessary, and thus colleges are desirous of maintaining their association with SPSS, SAS, and Mathematica, even though few companies have these programs. Increasing numbers of companies are using the **R** statistical package for creating presentation graphics that go well beyond Excel's impressive capabilities. The **R** program is free, and there are researchers who add new functionality to the program almost every day. As more companies do use **R**, graduates who have some experience with it will be more valuable.

Lastly, no technology program is complete without delving into the big data problem and herein lies a plethora of challenges, not the least of which is, which program to use? The DB people out there will argue that their traditional relational database is the solution to all big data problems. It only requires a company to purchase their product, then migrate ALL the data over to it. This is a very expensive and

time-consuming endeavor that might, in some cases, actually work, though the dashboards created are merely the result of relational queries. Without the advanced knowledge necessary to create an appropriate query, the knowledge contained in the database remains hidden. For the masses of companies, such a movement is not financially viable. Is there another solution?

6. ENHANCING THE FUNDAMENTAL TOOL

Of course, there is another solution, if one is willing to look for it. Rather than engage in learning, mastering, and developing expertise in an entirely new software program, it seems too simple to build on Excel, a program that can arguably be called *THE fundamental tool of analysis*.

There is at least one methodology that brings the ability to create very sophisticated pivot table-like technology of virtually any number of dimensions into Excel. This is online analytical processing (OLAP)! It can bring data from text files, other Excel files on any other computer in a company connected to the company network; database tables from Oracle, Access, SQL, and many others; and Internet-derived data into a single cube that can be sliced into reports composed of hundreds - if not thousands - of individual reports. The power of analysis comes into play only when one has the relevant data on which to perform the analysis. The OLAP tool is an Excel add-on, so that with everyone already having expertise in Excel, moving a class of students to further expertise with big data analysis greatly enhances their marketability.

Further, these skills can be enhanced and amplified in other domain-specific courses, as the students continue with their studies. Recall that what is being proposed here is an *introductory* course in business technology, even though for some colleges the intro course is the only course available to B-students.

7. CONCLUSION

This paper is anecdotal in nature, as evidenced by the complete absence of references that we promised in the introduction. This is intentional.

Students subjected to traditional introductory courses in MIS find them every bit as boring as they are often to those of us who must teach them. If one ever wanted to discourage students from a career in MIS/IS/IT/etc, then one could not find a better way than through the intro course. Students see no use in it and loathe the content. Some national exams that are used to make comparisons among institutions end up comparing a one-course MIS program with a full major program at another and wonder why there are nonsensical differences. We graduate students who are going to be employed in companies and organizations that typically possess only a small-computing environment, where the sole commonality is the Microsoft Office suite of products, chief among them Excel.

Graduates should have mastery over Excel at increasingly sophisticated levels of ability. Being Excel certified is necessary to show expertise, but not sufficient to become a distinguishing force in a company. The classroom must cover far more pressing, conceptually demanding, and complex application-oriented problems. Beyond Excel, some expertise in a statistical program that assumes a statistics course prerequisite, such as R, should be included. Finally, accessing big data is the realm of OLAP. Development of expertise in this trio of products would best serve students (our product) and their futures, make B-schools far more attentive to their customer needs (the hiring company), and create a far more motivated and excited student body. For those who want all the other technical background, we make this recommendation: become an MIS/IS/IT/CIS/etc major.