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The Development of a Comprehensive Logistics and Transportation Software Technology Survey Instrument

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Abstract

In this paper, we developed a comprehensive survey instrument that will be distributed to the leading U.S. Logistics and Transportation schools. We describe the specific procedures that were followed to build the preliminary version of our survey. We hope that this survey will help the Coggin College of Business at the University of North Florida learn about the leading software technology adoption patterns at our peer institutions.

Introduction

At the beginning of the semester, our undergraduate Logistics Subsystems Analysis class was assigned the task of creating a survey through which we could determine how the top U.S. Logistics and Transportation Universities are adopting supply chain technologies. The purpose of the research was to provide an overview of each school's supply chain program academic curriculum and resources. Our class would then use the results to help determine what types of supply chain software have been implemented within each school's program. This information would allow us to establish a general consensus on what are the most popular types of software are among schools throughout the country, as well as what the costs/benefits are in doing so. In order to accomplish our goal, we began by developing a plan and putting it to work to create our supply chain technology survey.

Research

Conducting research on how the leading U.S. Transportation and Logistics programs operate at various universities was not an easy task. To begin our research, we conducted a brainstorming session to determine what our goals were going to be for the assignment and how we wanted to accomplish them. During our first brainstorming session with Dr. David Cantor we developed questions that would be vital for our survey. Our initial goal was to capture what software programs/modules universities were using and how they were beneficial to the leading transportation and logistics institution. We began with a broad approach to determine what is needed in a supply chain software laboratory. We composed approximately 10 questions for each category within our survey [See Appendix A, figure 1]. Some of the initial questions were: '"Is the course worthwhile to the student? How are companies using SCM technology? Which software does each University use?" These questions enabled us to begin building our survey. When composing questions for the employers we wanted to identify how they could benefit by hiring students with prior experience in Supply Chain Technology Software. The questions we designed for the students were to verify how comfortable, successful, and the acquired benefits gained from using supply chain software in a classroom setting. We wanted to identify what type of staff they have teaching in the supply chain labs. Lastly, we wanted to verify the comfort level for the professor and how they coordinated their classroom training. This is the information we wanted to gain from conducting our

survey. Having this information would allow us to use the results to implement a more successful lab for students and staff at the University of North Florida ("UNF").

After our first brainstorming session we decided to compose 10 additional questions to identify more closely how the adoption of an SCM technology course at the University of North Florida could be successful. Prior to meeting with Dr. Cantor, he emailed a listing of approximately 35 Universities we would survey [See Appendix A, figure 2], including Penn State, Michigan State, Georgia Southern, University of California-Berkley, among others. In addition, Claudia Andreani researched additional schools outside of the United States that we could survey to obtain international information including University of San Andres, University of Chile, etc. This would allow us to receive results from both international and domestic academic institutions. The intended initial recipient of the survey was the Chairman of the SCM/Logistics department at each University. This would be an official employee of the college with multiple years of experience in the field.

Our next task was to develop a timeline to identify the dates for our goals to be met. In the course syllabus we had many objectives to cover, but the survey was an important task. So, each week we had at least one day to review or update survey items. This allowed us to be organized and have the ability to meet all goals. Next, we held additional out of class sessions including two sessions which occurred for over 3 hours. These sessions enabled us to develop a total of 15 questions [See Appendix A, figure 3]. These questions would allow us to uncover more in-depth information regarding the infrastructure required to develop and maintain a logistics and technology laboratory as well as the support resources needed to operate the lab. Therefore, our survey provides more concise information related to the laboratory instead of every individual involved. After these questions were composed in Microsoft Word, we had someone proof-read the survey. The survey was prepared for its first critique by Dr. Cantor to determine if we were meeting the expected goals. Unfortunately, the survey was not up to par and needed more modifications. The feedback we received from Dr. Cantor in class was to be as precise, detailed, and grammatically correct as possible. We wanted the recipients to take our survey seriously. The survey format was redesigned to be more user-friendly by including charts in Microsoft Excel [See Appendix B]. The format of our second draft was much better than the first, but additional work was needed. We made additional corrections each time to grammar because our intended message was never communicated in detail. For example, Dr. Frankel was one of the professors who critiqued the survey. He felt the survey was difficult to understand. Using his feedback we revised the survey so that it was more specific. In addition to entering the data into Excel we took approximately one week trying to find an Adobe Acrobat program that would allow a user to enter data. We contacted many professors in the Coggin College of Business and were unable to locate this program. As we were contacting the various professors, Dr. Cantor received information about the benefits of using UNF's web surveyor program. This electronic software was cost effective and user friendly for all of our potential recipients completing the survey. The initial input of the survey information was tedious due to the unfamiliarity of this program. Claudia spent approximately 8-10 hours designing the survey questions and matrix into web surveyor for a draft [See Appendix C].

We wanted to have our 2nd survey draft completed by October 18 for the Council of Supply Chain Management Professionals (CSCMP) conference in Philadelphia, PA. The CSCMP conference is a major logistics and transportation academic conference. It was our goal to receive preliminary feedback about our survey from some of the leading logistics and transportation programs at CSCMP. Prior to this conference, we needed to make changes to the survey based on Dr. Robert Frankel's feedback. He suggested the importance of incorporating multiple courses per type of software that we identified on the survey. The survey, as it was primarily designed, did not leave room to identify when different courses utilized the same software. We made the corrections to the survey according to his recommendations. Once the information was entered into web surveyor (the UNF software survey program), the group proofread and edited the questions which required approximately 2 hours of time. The continuous restructuring of the survey allowed us to become more familiar with the software and spend less time when making corrections.

There were three main problems we faced when composing the survey: 1) to make the survey available in either hard copy soft copy format; 2) which software programs should be pre-identified in the survey; and 3) identifying the challenges associated with building and maintaining a logistics and transportation computer laboratory. First, traditional surveys have been administered and distributed in hardcopy format. However, we were highly interested in composing an electronic survey. In order to evaluate the pros and cons, we developed the following list

	Paper	**Web based**
Pros		
	Hardcopy	Inexpensive
	Better Design	Straight Shot to email
	Stop and Go Back	Reduction in turnaround time
		Stopping point Easy transition of data from survey
	Visual grasp of length of survey	Fast Analysis
	Choose which question to answer	Convenience
	Sense of urgency to complete	Point and click options
	Cons	
		Expensive Capabilities of building custom questionnaire
	Time Consuming	Email Filters
	Handwriting	No reminder/misplace (forget)
	Long Analysis Time	
	Hard Transition to Excel	
	Inconvenient	

After analyzing the above options we decided to develop an electronic survey. Over the years the traditional way of doing surveys has changed. In response, the electronic survey will be easier to administer. The programs we initially indicated in our survey were SAP, i2, Oracle, IBM, and other. These were common programs that we

thought most Universities were using. So, we entered these software programs into the survey to allow the survey recipient to reduce survey time. This way the recipient could choose if he/she would like to take advantage of an open-ended question or point and click option. This was the end of our survey editing and updating for the CSCMP Conference.

On, Tuesday, October 23, 2007, Dr. Cantor returned from the CSCMP conference with multiple pages of feedback from professors. This conference was filled with administrators, software program companies, students, and professors from various universities. The survey was viewed as a great project. Claudia networked with students from other schools and software companies to gain information for research. For example, an initial question indicated in the survey was, "What is the average cost of the software program?" This question was designed to identify the average expected cost that UNF will have to pay for this lab. So, by Claudia networking with representatives directly from the software company, we could contact them and get the needed information regarding this area. The survey was not where it needed to be grammatically and it was still difficult to understand. For example, at CSCMP, we received feedback from Dr. John Macdonald (University of Maryland). Dr. Macdonald suggested that we needed to alter the format of the survey because some questions were redundant. So, in response we held two additional editing labs to address these matters. Once we adjusted these questions we proofread again and contacted Dr. Yemisi Bolumule for additional feedback. The session with Dr. Bolumule was approximately 2 hours long. After having several sessions of proofreading we expected our survey to be almost finished. However, after reviewing the survey with Dr. Bolumole she suggested great alternatives that we should transition the survey entirely. Some of the suggestions included [See Appendix A, figure 4 for more questions]:

1. Demographics or general info?
2. Do not send to chair of department
3. Reword Supply Chain software technology (remove technology): this cover more than what we are trying to find out (how about school that teach RFID technology?)
4. Call top 2, middle 2, bottom 2 universities to ask what software they are using, instead of narrowing down to just a few known software (what if my university doesn't use these? Are we not using the right software?)

Introduction: we want to evaluate uptake of Oracle, SAP, and i2

Build survey to find out what schools are using

Build survey from findings

The overall decision from the meeting with Dr. Bolumule was to first conduct an over the phone survey to pre-identify the software being used by the top 2, middle 2, and bottom 2 universities in the supply chain management field. Once we obtain a generalization of the type of software being used, we will be able to input them into our final survey. However, the survey will be placed on hold for completion until Spring 2008. This will allow us to obtain accurate information and use it correctly. This suggestion was great and it assisted us greatly with producing this survey.

Lastly, we interviewed three additional schools to have them proofread the survey and provide software use information. The first professor was Dr. Travis Tokar who is a

professor at Ohio State and received his PhD from University of Arkansas. He provided insight on behalf of both schools information as a student and professor. He indicated the following:
1 – Ohio State and Arkansas do not use any ERP technologies as a part of their logistics programs.

2 – Arkansas does have an RFID lab

3 – There was talk at Arkansas about offering a course that trained students on a specific Wal-Mart software program – but it was decided that this didn't make sense at the time.

4 – Some faculty may demo a software package to their students; other faculty may have students play a computer simulation game.

5 – We should ask question about the department make-up (e.g., marketing and logistics department; supply chain and information systems department, logistics only).

6 – Some of the items in Questions #11 need to be reworded: #2, change coupe to 2 to 3 years ago; #10 – change is not worth too much to something like the benefits outweigh the costs; #11; rephrase to something like "because you need a lot of training to use it". Delete the too in too overwhelming.

7 – Travis recommends that we pre-qualify the key informant before sending the survey out to them. Also, he recommends that question #18 be moved to the front of the survey.

8 – Tom Goldsby used logistics software at Ohio State before he moved to the University of Kentucky

9 – He liked the questions in section 11 – including the last 4. The last set of questions in section #11 assesses any privacy or insecurity issues.

10 – He recommends that we conduct a pilot survey to get additional feedback/reaction.

11 – He likes the idea of conducting this survey.

In addition we received feedback from Dr. Craig Carter from the University of Nevada, Reno. He provided the same type of feedback regarding technology adopted and corrections to the survey.

1 – Please add a question about the # of students in the logistics major

2 – Add a question about the # of logistics faculty in the department

3 – We might want to identify our sample using a list from the SCM review article, CSCMP, or AACSB list.

4 – We could call each of the 120 logistics programs and ask the dept head who would be the appropriate person to complete our survey – since the number of schools is so small.

5 – He likes that we are calling a sub-sample of schools to pre-identify the technologies that each of them are using/

6 – He uses vertical net (an auction software program) in his class. Also, he uses a beer distribution game that was developed at MIT in his course.

7 – He thinks that the "other" category in some of our survey questions will cause problems in terms of the type of information that we collect.

8 – In question #11, item #10, requires should be require (singular tense)

9 -- In question #11, item #11, this question should really be two questions.

10 – The phrase of question #12 is awkward. We are using the term follow/following twice.

11 – Also, with question #12, how can a faculty member answer the question from a "student" perspective? He suggested that we implement a survey that collects this information from a student perspective.

More feedback also came from Dr. Thomas J. Goldsby, who stated that at Ohio State University, we needed to talk to Dr. Walter Zinn or Dr. Keely Croxton, who were responsible for brining software tools to OSU. Dr Goldsby believed that they now use LogicTools.
A consensus shows that professors believe that student feedback is also fundamental when implementing labs. The main key to identifying what elements are needed is to ask the participant of this survey.

Conclusion

In the end, our research proved to be more difficult than expected. The methodology to constructing a survey must be precise in order to receive the exact information needed. Our feedback provided great input as to what we must now focus on when developing our survey. The goal of our project was to inquire on how the top U.S. Logistics and Transportation schools have implemented supply chain technologies in their curriculum. Throughout our research we determined that in order to succeed at our fulfilling our goal, we needed to focus on accuracy. In order to receive complete, honest, and accurate answers from our recipients, this survey was going to need to be accurate and straight- to-the-point. Accuracy would also help eliminate the redundancy of the survey as well. Unfortunately, we were unable to complete our assignment as planned but it has been a good learning experience for the group. The duty of creating the survey will now be passed on to the next group, who will have a better understanding of what will be required of their survey to make it the most accurate and beneficial to their study.

Appendix A

- Figure 1 -

Questions to ask:

EMPLOYER:

How are companies using SCM Technologies?
What are the expectations regarding ROI on these technologies?
What companies are using SCM Technologies?
What is a company's technologies budget?
What are the problems that companies have had with SCM Technologies?
Who are the major software players?

STUDENTS:

Is SCM worthwhile to students?
What skills do students need to receive regarding SCM software technology?
Do student prefer to use production SCM software vs. a student software version?
Should students be certified as SCM technology "expert"?
Is a student's starting salary higher if he/she has SCM technology skills?

UNIVERSITIES:

What are some SCM software solutions that you offer?
Has the SCM software lab been a cost effective venture? What are the cost/ benefits associated with building a SCM software lab?
What are the major schools that are using SCM software?
Which courses are using SCM technologies?
What is the enrollment like in these courses?
Is the SCM course a core requirement? Elective?
How long has the institution been offering the SCM course?
What is the instructor's background in SCM course technology? Did the instruction receive specific SCM training?

Is the institution using a dedicated lab for SCM courses? Open/ general lab?
How many professors teach SCM technology based courses?

Class size?
1-on-1 student/pc or teams?
Special textbook?
Student work in groups?

- Figure 2 -
List of Schools to Survey

1. Penn State
2. Michigan State
3. Ohio State
4. Tennessee
5. Maryland
6. ASU
7. Iowa State
8. MIT
9. Georgia Tech
10. Northwestern
11. Arkansas
12. Nevada-Reno
13. Auburn
14. Syracuse
15. Georgia Southern
16. Wisconsin-Madison
17. North Texas
18. Stanford
19. Oklahoma
20. Cranfield School of Management
21. University of Wales (Cardiff)
22. Kansas State University
23. Helsinki University of Technology
24. University of British Columbia
25. John Carroll University
26. Eindhoven University of Technology

27. Copenhagen Business School
28. University of California, Irvine
29. Florida State University
30. University of California, Berkley
31. National University of Singapore
32. Texas A&M University
33. University of Sydney
34. Monash University
35. University of Chile

- Figure 3 -
First Microsoft Word survey

Transportation and Logistics Software/Student Analysis Survey
Is this offered in the undergrad? Grad?
1. Does your University use Supply Chain Management Software for academic courses? Please circle one Yes/ No

If so, which Information Technology or Software program do you use?
Please circle all that apply
Oracle SAP IBM I2 Other _____

Which program from the above listing would you rate most preferred 1 to 3 least preferred?
Based upon the software you currently use, please rank
Oracle_____ IBM _____ Other_____

SAP _____ I2 _____

2. Are you currently using this software?
Please circle one Yes / No
When was it installed? _____

3. Was this Software donated or purchased?
Please circle one Donated/ Purchased
If purchased which best describes the estimated cost?
Please circle one

0-99,999
100,000-249,999
250,000- 749,999
750,000- 999,999
1,000,000 and above

4. How many training courses are offered? How many academic courses are using SCM software? Please circle all that apply 1 2 3 4 5 6 7 8 9 10
Please list courses that are being offered:_____

5. Does training provide vendor-certification to students? Do students receive vendor certification after completing the course?
Please circle one Yes / No

6. Are there dedicated technology labs for this software?
Please circle one Yes / No

If so, are there fees associated with this lab? Do you charge lab fees to support this course? (beyond traditional tuition classes) – If so
Please circle one 0-25 26-30 31-45 45-61

How many faculty members are responsible for teaching the software? Any full-time administrative staff provide support to your courses?

7. Is the trained staff certified with SCMSA?
Please circle one Yes / No

8. Are there companies that coordinate programs with your SCMSA technology?
Please circle one Yes / No
Were local companies involved in the selection of the software you are currently using?
9. Is this course a core requirement?
Please circle one Yes/ No

Is this course an elective?
Please circle one Yes/No

10. What are the projected class sizes?
Please circle one 1-15 16-30 31-50

11. Are these SCMSA programs taught in groups or individually?
Please circle one
Groups (3 or more)
Pairs (2 members)
Individuals

12. If printed material is provided for this course, what is offered?
What kind of teaching materials do you use to teach this course?
Please circle all that apply
Academic Textbook
Vendor-provided Script
Vendor-provided Software Manual
None
Other

13. Is this a production-software?
Please circle one
Yes / No
Do you use any Student-software?
Please circle one
Yes / No

14.
Please describe any positive experiences with using SCM software.
Please describe any negative experiences with using SCM software.
What other recommendations would you give to other universities that are interested in adoption SCM software?

Demographics:
Name
University

Location
# of undergraduates
# of grads
# of Logistics majors
School population
Commuter or residential campus
Are laptops required for enrollment?

- Figure 4 -

Dr. Bolumole's feedback:

- Need to re-evaluate the collection of demographic and general information that we ask survey respondent.
- Need to reword the statements in the introduction of the survey
- Do not send the survey to the chair of the department
- Reword the question about the type of campus: Commuter/ Residential/ both
- Reword SC software technology (remove technology): this covers more than what we are trying to find out
- Add comments before Q2 w/ definition of SC Software (do not use "Example")
- List questions in groups (using a matrix formant)
- Conduct a brief survey to find out what types of software technologies are being used by the top 2 L&T schools, middle 2 L&T schools, and bottom 2 L&T schools
- Selection of sample of 1st wave has to be convenient to build most robust table
- Q7 leads to answer yes/no
- Software is taught as a pedagogical tool
- How many faculty are using software in their teaching?

Remove: software is a commercial/ academic version….it's an enterprise
* Q8: make drop down (instructor-developed material)- universities don't develop materials, professors do.
* Q9: DO you have a preference in the method of delivery?
*Q10: goes to #4 (add typical enrollment)
* Q11: don't use "my department" is to emotive
re : use "I like the…" (from the person who answer)
* Q12: reword SCMSA
deliver, capture
understand (tool) and ability to solve content (recraft based on teaching)
* Q13 what do you like best/ least about it?
Any issues from points above, is there anything else u would like to add/ we may have missed?
* Have you had to change…., gone away?
Add/ capture history of doing this (SCM) at the University.
* Q16: move to 2, 3, 4
* Q18: remove

Appendix B

Name of Institution:
Name of college of business:
Location:
Name of Respondent:
Title:
Years of affiliation:

Population of College of Business:
Number of undergraduate students:
Number of graduate students:

Commuter or residential institution?
Are laptop computers required for enrollment?

Instructions:

	ORACLE	SAP	IBM	i2	OTHER (Specify)
Which Software program do you use? Please check all that apply					
Please state which modules of each software program you are using					
Please rate which program you prefer (1: most preferred - 5: least preferred)					
When was the software installed? (yyyy)					

Was the software donated (D) or purchased (P)?					
What percentage of the module do you use of each of these programs?					
Cost of software (please check all that apply)					
$0 - $99,999					
$100,000 - $249,999					
$250,000 - $749,999					
$750,000 - $999,999					
$1,000,000 and above					
How many academic courses are using SCM software?					
Do students receive vendor-certification after completion of course? Y / N					
Are there dedicated technology laboratories where the software is taught? Y/ N					

Are there lab fees to support this course (beyond traditional tuition charges) Y / N					
Lab fee range $1 - $25					
Lab fee range $26 - $30					
Lab fee range $31 - $45					
Lab fee range $45+					
How many faculty members are responsible for teaching the software?					
Are instructors certified in SCM software?					
Are there companies that coordinate programs with your SCM software technology?					
Is the course/s a core requirement (C) or an elective (E)?					
Is this an undergraduate (U) or a graduate (G) course?					
What are the projected classes? (1-15 / 16-30 / 31+)					

Organization of student group per computer:					
Groups (3 or more)					
Pairs (2 students)					
Individual (1-on-1)					
What kind of teaching materials do you use to teach the course?					
Textbook					
Vendor-provided Script					
Vendor-provided Manual					
None					
Other					
Is this a Production-software (P) or a Student-software (S)?					

Rate the following questions as follows: 1 – easiest / 5 – most difficult (Please circle)					
Ease of understanding SCMSA technology? (Faculty/ Instructor perspective)	1	2	3	4	5
Ease of learning SCMSA technology? (Faculty/ Instructor perspective)	1	2	3	4	5
Ease of understanding SCMSA technology? (Student perspective)	1	2	3	4	5
Ease of learning SCMSA technology? (Student perspective)	1	2	3	4	5

Please complete from your faculty/ instructor perspective:
Please describe any positive experiences that you have with implementing or using supply chain technology for teaching purposes.

Please describe any negative experiences that you have encountered while implementing supply chain technology as a teaching tool.

What other recommendations would you give to other universities that are using SCM software

Please complete from student perspective:

Please describe any positive experiences that your students have with using the supply chain technology in your department's courses including teaching evaluations, job placement, and general classroom experiences.

Please describe any negative experiences in regards to software implementation, use of technology, teaching with the technology.

What other recommendations would you give to other universities that are using SCM software

Appendix C