

What do IT Professionals think about the future of COBOL?

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ABSTRACT

This paper shows the results of a survey given to IT professionals. The results provide some insight into how IT professionals are thinking about the future direction of COBOL. Since these professionals are on the so-called "frontline", they should certainly have a good idea of what is expected to occur in their industry within the next five years. These results should provide valuable direction to academics in assisting them in their curriculum plans for the new millennium. Should the Structured approach be continued and/or supplemented with Object Oriented COBOL? Answers to questions like this and others can provide valuable insights for the academic community.

INTRODUCTION

Many companies are currently spending a lot of time making sure that their systems are Y2K compliant. Industry wants to make sure that their company will cross over into the new millennium safely. There are others who were just as deeply involved with monetary conversion processes of the new European Union, which took place on January 1, 1999. These two issues, the Y2K problem and the currency conversion of the European Union, have certainly received global attention over the past few years. Educators, on the other hand, have a constant struggle trying to train each new generation of students in a dynamic technological environment we have today. Trying to develop skills and knowledge in these students that will be acceptable and useful to the current and future business world is a formidable task. Educators should try to instill in students a sense of flexibility and long term learning methodology. This new generation must realize that learning is a life time experience, and not just a four year glitch. Just as it takes several years to take a new car design from the drawing board to the dealer showroom and finally to the buyer's driveway, it is the educator who has a similar concern. The educator is concerned that when the student graduates, that student will be properly prepared to blend into the mainstream of the on-going business world.

Because of the Y2K problem, COBOL language programmers have seen a substantial increase in demand from corporate IS departments. Educators, mean while, have seen increased enrollments in their COBOL classes. At the same time that educators are experiencing this increased interest in COBOL programming there is still another factor affecting this area, and that is the concept of Object Oriented programming. Educators are concerned with the problem of properly preparing these new students in the face of a changing programming environment. When should the structured methodology no longer be taught? When should the OO approach

start? Should there be a period of presenting both methods in parallel? Which is the best way to go? These and other questions are being discussed by IS faculty.

In order to get a better idea of what industry thinks about the situation, a one page survey was recently deployed at the Micro Focus User Conference which was held May 18-22, 1998 at the Walt Disney World Dolphin hotel in Orlando, FL. The results of the survey, presented here, will give the reader some insight as to just what these professionals are thinking about and what they are concerned about regarding this industry and its future.

Previous Research

Before we look at the results of what the current professionals think about COBOL, lets look back a few years to see what others were thinking at that time. There were those who would "bad mouth" COBOL, while others got into a more vocal "COBOL Bashing" routine. Unfortunately, these people, as well as true COBOL die-hards, did not realize what affect the Y2K problem was going to have on the demand for COBOL programmers. Farwell¹ stated that fourth-generation languages would replace traditional COBOL. And the phrase "COBOL IS DEAD" started to make its way into various venues. This seemed to be the prevalent tone back in the early 90's. He indicated that there would be a paradigm shift, and that educators and industry should be prepared for this shift. Although object oriented type languages were around, there was nothing mentioned in this study about OO languages and definitely nothing about OO-COBOL. He suggested that the MIS curricula should focus on two specializations: software development and business analysis.

In another study Leitheiser² looked at various skills needed by MIS professionals over the next ten years. He compared 1990-1995-2000 data. He found that the language skills area had the lowest relative rating of importance. The absolute rating

The Future of COBOL and Object Oriented Programming

Given the results shown in Table 9, there are other strong feelings, which the respondents had toward the current structured COBOL approach and the OO-COBOL approach. Table 10 provides us with some very strong indications that those currently in the profession look very favorable towards both the "old" and "new" methodology.

TABLE 10

Structured COBOL should continue to be offered on the undergraduate college level. (n=46)		OO-COBOL should be offered on the undergraduate college level. (n=45)
87%	YES	87%
13%	NO	13%

TABLE 11: Programming in COBOL will change from the Structured to the OO approach.

Percent	
16	will not change
63	within the next five years
16	within the next ten years
5	over 10 years

TABLE 12: Do you envision that OO-COBOL will:

100%	replace current Structured COBOL
0%	compliment current Structured COBOL

TABLE 13: What is your feeling for OO issues?

Percent	
79	OO will be as popular as structured form, but will not totally replace it.
19	OO will become the standard for future programming
2	OO is a fad and will fade away

TABLE 14: Has your company started to write OO-COBOL code?

	(n=45)
Yes	13%
No	87%

TABLE 15: Has your organization started to write any type of code in OO terms?

	(n=46)
Yes	59%
No	41%

These figures seem to indicate that the interest in both is very strong. What educators are interested in is whether this interest is going to change, and if it does, how long before this change will become predominate. Table 11 provides a little look into the future by indicating that 63% believe that the change from the structured to the OO method may occur sometime over the next five years. An additional 16% believe that this change will occur within the next ten years. The results in Table 11 are further backed up with the results posted in Table 12 which indicated that all of the respondents believe that OO-COBOL will replace Structured COBOL.

A contradictory result posted in Table 13 shows how the respondents feel toward OO issues. Although they seem to contradict to a minor degree the results in Table 12, the overall emphasis is definitely toward OO-COBOL.

Current OO Programming

If the feeling of the respondents is so positive toward OO COBOL and its future use, it might of be interest to find out whether or not COBOL is current-

ly being written in OO terms and to what extent. Also of interest is the fact whether any other language is being used by these companies in OO form, and how does its usage relate to OO-COBOL. Table 14 & 15.

Given the fact that almost 60% of the companies are writing code in OO form already, it is equally important to find out which of the OO languages are they using. Table 16 provides us with the answer to that question. 57% of the respondents listed a particular OO language(s) that they currently use, while 43% indicated that they do not use any OO language. Of those responding, several indicated that more than one type of OO language being used by their company. (Table 16) Given the results shown in Table 16, they were further asked whether they felt that any of these languages would replace COBOL. An overwhelming 88% replied NO. (Table 17)

TABLE 16: OO Language being used by Respondent's company

	(n=26)
C++	15
VB	10
JAVA	6
PowerBuilder	4
SmallTalk	2
COBOL	2
C	1
Pasca	1
J++	1

N.B. More than one language being used by several companies

TABLE 17: Do you foresee any of the Languages listed in Table 16 replacing COBOL?

Yes	12%
No	88%

Summary

For those people who are currently working in the IS industry, the respondents in this survey seem to give a substantial positive nod towards the importance of OO-COBOL in the future. They seem to indicate a very strong feeling toward the importance of students having OO-COBOL experience as shown in Table 9. This experience can only be gotten, if the schools offer such courses, and 87% believed that such courses should be offered on the undergraduate college level, as shown in Table 10. The majority, 63% believe that the OO-COBOL approach will replace the current structured approach over the next five years, while almost 21% believe that it will happen over the next ten years. Even though there is a strong feeling toward OO-COBOL, these professionals still believe that structured COBOL will not disappear entirely (Table 13), and furthermore they do not see any of the current OO languages being used by their companies replacing COBOL. (Table 17).

What does this all mean for the educator? It means that curriculum changes will have to occur in the future. The best time to start this change is actually now. Structured COBOL as well as OO-COBOL will have to become part of the curriculum, if they want to satisfy the demand by industry. They will make their student more marketable, if they provide them the experience of dealing with OO-COBOL during their undergraduate programs. (Table 9) It seems as indicated by the results in Table 11, that this conversion from structured to OO form is definitely going to take place within the next five years. Educational institutions are going to have to be ready to modify their curriculums in order to be up-to-date, and to properly prepare their students for the future work place.

level in this category did increase from '90 to '95 to '2000. It is important to remember that the results indicated here are based on perceptions and not on history. These perceptions also indicated that languages such as "C", OO type languages, and AI were expected to increase to a level of importance equal to COBOL. Obviously perceptions and history do not always come up with the same numbers.

Other studies [Lee³, et.al. and Trauth⁴, et.al.] looked at what skills are needed in order to have a competent MIS staff. The one study found that there was actually a "expectation gap" between what industry really needed and what the academic institutions were actually sending out into the business world. It was concluded that these companies and their representatives were actually sending out inconsistent messages to the students concerning their skills needs. The company recruiters were emphasizing development and maintenance of applications, even though these skills were perceived by the practitioners as being of a declining nature. Meanwhile the educators were preparing the students in a way that they would be able to be assimilated directly into the current work stream.

Demographics

The results shown here represent the views of a variety of IT professionals (n = 46)^A from numerous industries. A list of industries represented in this survey is shown in Table 1, while the positions held by each individual are shown in Table 2. The participants in the survey were mostly males (Table 3) who had a median age of 42.8 or an average of 43.3 (Table 4). The conference

attendees were basically from the south, southeast, midwest and some international representatives (Canada, UK, and Australia) as indicated in Table 5. Due to the fact that the conference was in Orlando, attendees from the pacific region seemed to be at a low level.

Since we want to look later at the educational aspects of COBOL programming on the next generation, we wanted to see what the educational background was of the current generation of IT professionals. Table 6 provides the details.

TABLE 1: Industries Represented

	Percent
IT Consulting	32.6
Finance, Insurance & Real Estate	19.6
Software	8.7
Manufacturing	6.5
Wholesale & Retail	4.3
Services	4.3
Gov't & International	2.2
Other	21.8

(ISV, Education, Health Care, Distribution, Transaction Processing, Engineering, Labor Union, Agriculture, Mining)

A. In future tables, if the total number of respondents is less than 46, then a specific sample size will be indicated in the title of the table.

TABLE 2: Positions Currently Held

	Percent
Department Mgr	17.4
Program Mgr	15.2
Programmer Analysts	13.0
Director of Software	8.7
Systems Analysts	6.5
Software Developer	6.5
Senior Consultant/Consultant	6.5
Educator/Trainer	4.4
Chief Programmer	4.4
Other	17.4

(Sr. Tech. Consultant, Systems Tech. Advisor, Sr. Application Analysts, Sr. Systems Specialist, CIO, Branch Mgr.)

TABLE 3: Respondents Sex

Male	89%
Female	11%

TABLE 4: Respondents Age

18 - 29 years	5%
30 - 39 years	33%
40 - 49 years	38%
50 - 59 years	17%
60 - 69 years	7%

TABLE 5: Geographic Area of Respondent

(n=34)	
Percent	
27.5	East
27.5	South/Southeast
25	Midwest
5	Southwest
15	International

TABLE 6: Respondents Major in School

(n=34)	
	Percent
CIS	24
CS	35
Management (CS minor)	9
Math/Econ/Physics	9
MIS/CS	3
Other	20

i.e. Accounting, Business Adm., Marketing, Music, Physics, Economics, Mgmt Science

TABLE 7: Participate in the Hiring of Programmers

Yes	61%
No	39%

TABLE 8: COBOL Course Requirements

Require	Percent
One semester of COBOL	17
Two semesters of COBOL	19
More than two semesters of COBOL	22
Not a requirement	42
	100

TABLE 9: Would it be beneficial to have OO-COBOL experience:

	Currently? (n=43)	In the Future? (n=38)
Yes	53.5%	86.8%
No	46.5%	13.2%

In testing the differences in proportions in Table 9, it was found that there is a significant statistical difference at the 1% level. The calculated value of z turned out to -3.23. There definitely seems to be a strong indication that these professionals certainly believe that future experience in OO-COBOL is definitely helpful to the new programmers. Relatively similar results were found when surveying a group of IT professional recruiters.³

Hiring new Staff

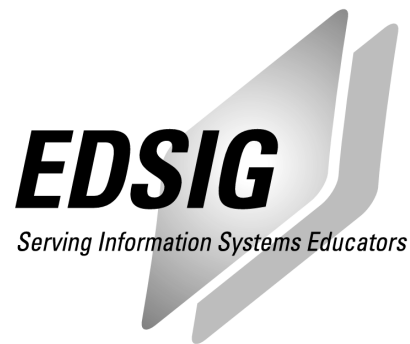
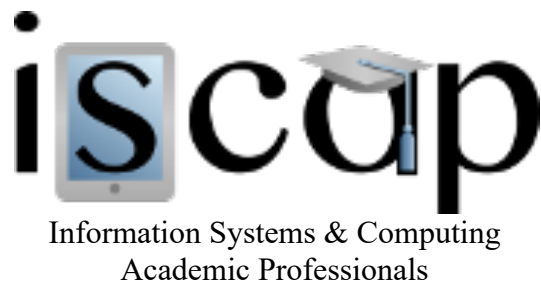
Given this group of professionals, the survey was trying to get some feel as to what these people were looking for in terms of requirements and talents of the new breed of programmers and system people entering the work force. Of those responding a little less than 2/3 of them actual participate in the hiring process (Table 7).

Of major concern to educators, and to their curriculum, is the need to determine what is industry actually requiring or wanting of their new recruits, and are the educational institutions actually preparing the new generation correctly for their needs. Table 8 lists the distribution of responses in regards to COBOL course requirements. Although a little less than 60% thought that one or more semester should be required, it was surprising to find that 42% did not have a requirement.

Another major concern for educators is the trend toward object oriented languages. We were interested in what the respondents thought concerning the new programmers experience in either working or not working with Object Orientated COBOL. Table 9 provides a comparison in terms of current and future benefits of having Object Oriented COBOL experience before starting one's entry level position with a company.

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ISSN 1055-3096