4-1985

Accounting for Software Costs: Problems and Proposed Solutions

William R. Cron

Thomas R. Weirich

Accounting for Software Costs

Problems and Proposed Solutions

By William R. Cron and Thomas R. Weirich

With the explosion in the use of computers, has come a revolution in the development of software for resale. A whole new industry has emerged to service the needs of software users. Over 4,000 companies presently are associated with the research, development, and manufacture of computer software for resale. This proliferation of computer software programs has brought to light some significant accounting issues. Of specific concern is the proper recording of the costs of computer program development. A considerable diversity in practice is evidenced by a 1982 survey by the Association of Data Processing Service Organizations (ADAPSO) and an analysis by the Securities and Exchange Commission (SEC).[1] In the survey by ADAPSO, 58 out of 231 computer science companies indicated they had capitalized some costs of internally developed software while the SEC reported that they identified 15 companies that capitalized development costs.

As a consequence of the divergence in the accounting for program development costs, the SEC has imposed a moratorium on cost capitalization. Companies that had not capitalized their internal development costs of computer software for sale or lease in either their audited financial statements or in reports filed with the SEC prior to April 14, 1983, would be prohibited from adopting such practices after that date. This moratorium is to be reconsidered after the Financial Accounting Standards Board (FASB) addresses the issue.

The purpose of this paper is to synthesize the current accounting issues and pronouncements dealing with the accounting for developed software costs, with particular emphasis placed on the problem of when to expense and when to capitalize. The issue is addressed in three parts. First, existing authoritative guidance is reviewed to determine generally accepted accounting principles (GAAP) as they exist today. Then the problems in implementing these standards are examined. Following this, the recommendation of the Accounting Standards Executive Committee's Task Force on Accounting for the Development and Sale of Computer Software (herein referred to simply as Task Force) will be presented.[2] In addition, the positions adopted by the FASB in an exposure draft[3] will be presented and compared with the Task Force's recommendations.

Authoritative Accounting Pronouncements

The initial attempt of the FASB to establish accounting principles for computer software costs is contained in SFAS No. 2, "Accounting for Research and Development Costs."[4] This statement, issued in 1974, required the immediate expensing of research and development cost. For purposes of the statement, the following definitions of research and development were adopted:

> Research — planned search or critical investigation aimed at discovery of new knowledge, with the hope that such knowledge will be useful in developing a new product or service ... or a new process or technique ... or in bringing about a significant improvement to an existing product or process.

> Development — the transition of research findings or other knowledge into a plan or design for a new product or process or for a significant improvement to an existing product or process whether intended for sale or use. It includes the conceptual formulation, design and testing of product alternatives, construction of prototypes, and operation of pilot plants. It does not include routine or periodic alterations to existing products ... even though those alterations may represent improvements and it does not include market research or market testing activities.

These definitions suggest that for the most part the costs of developing computer software would be classified as research and development and would be expensed. However, the possibility of another treatment was left open in the section which presented the basis for the board's conclusions. The board specifically mentioned the costs of computer software and stated each case had to be evaluated on its own merits. Therefore, this statement became the focal point of discussion as to when it is proper to capitalize computer software, and that decision was left to the judgement of the accountant for each case.

Immediately after SFAS No. 2 was released, the FASB issued Interpretation No. 6,[4] which attempted to give several examples of the application of Statement No. 2 to software costs. The interpretation defined a process as a

system whose output is to be sold, leased or otherwise marketed to others. It could also be used internally or be part of another product or services to be sold to others. Software costs developed for resale, either by itself or as part of another product or service or for internal use, presumably would be considered a process.

If the software is developed for sale by itself, the deciding factor as to whether or not its cost is to be considered R & D is the creation of a new or substantially improved product. This criteria would also hold for software developed by a computer service firm where the computer services are sold, rather than the software itself. Software costs would not be considered R & D if their main purpose is to simply alter or improve an existing product. Although these provisions suggest the key element in the decision is the degree of innovativeness of the software, it still leaves open a wide range of judgement as to when the software is sufficiently different from existing alternatives.

Software costs may also be incurred for use as part of the production of some other product. The interpretation specifies that these software costs should be considered R & D only when they are part of the conceptual formulation of the product, aid in translating the product into a design, or are part of the search, design and evaluation of alternatives prior to the beginning of production. An example of when software costs would be considered R & D is the development of a graphics program for design of a new automobile. Software costs would not be considered R & D when it is just a routine modification or adaptation of a product to a particular customer's

need, such as small changes in an accounts receivable billing program to accept a particular customer's chart of accounts. However, for practical purposes not considering this latter category of costs as part of R & D may have little effect as they probably would be expensed anyway.

The third official pronouncement dealing with computer software costs is Technical Bulletin 79-2.[6] This bulletin attempts to clarify Statement 2 and the Interpretation by stating that all computer software costs are not necessarily research and development and hence may not be charged to expense. However, the bulletin did not offer any further guidance as to when to capitalize these non R & D software costs. The Interpretation also identified three situations where software costs would not be considered research and development. These are:

1. Software developed for selling and administrative activities.
2. Purchased software, unless the purchased software is used in a research and development activity.
3. Software developed under a contractual agreement.

Table 1 presents a summary of the current authoritative pronouncements for software costs.

Problems in the Application of Accounting Standards[7]

Judging from the results of the ADAPSO and SEC surveys mentioned earlier, these pronouncements have not resolved the issues in accounting for software costs. Part of the explanation for the diversity in practice that exists today stems from two causes. First, the process of planning and developing software is a complex phenomena. Therefore, it is difficult to determine which elements in the process should be considered R & D. Second, many of the terms utilized in Statement No. 2 and Interpretation No. 6 are subject to varying interpretations.

The development and production of software involves two major subdivisions of activity. While the actual procedures for the development of software may vary considerably between companies, there is normally a planning and design phase, and a construction phase. During the planning and design phase, the feasibility of the product from a technological market and financial point of view is determined.

Technologically, the feasibility studies must consider the types of features or functions the software will perform, the product specifications to accomplish these desired features and the methodology that would be used to actually produce the software. An actual working model is not necessarily required at this point. If the software is similar to other commercially available software, determining the technological feasibility may be a simple process. However, if the software is a completely new product it may be necessary to actually develop a rough working version to establish that the concept is feasible.

Market feasibility must consider the potential market for the product and its competing alternatives. In concert with the specification of the product, any documentation required for the software and any customer assistance that is required to support the software should be determined.

In addition to technological and market feasibility, a company must determine if the software would represent a satisfactory, profitable product. This entails a consideration of the potential revenue that could be generated by its sales and the amount and costs of resources necessary to construct the product. The potential costs and revenues are then translated into return on investment measures to determine if its production is financially feasible.

The entire planning and design stage is an iterative process. It may require repetition of several of the steps in the process as modifications of the software are made in light of the feasibility studies conducted. These modifications frequently occur during the planning process, but they can occur even after production of the actual

TABLE 1
Authoritative Accounting Guidelines
for Software Costs

APPLICABILITY	AUTHORITATIVE PRONOUNCEMENTS	BASIC GUIDELINES
Guidelines are applicable to costs incurred for the internal development of software —	1. FASB Statement No. 2 — "Accountng for Research and Development Costs"	All R & D costs that are incurred to develop intangible assets internally, including computer software programs, should be expensed as incurred.
• as products or processes, to be sold, leased, or otherwise marketed to others,	2. FASB Interpretation No. 6 — "Applicability of FASB Statement No. 2 to Computer Software"	Acquisition, development, or improvement of a process by an enterprise for use in its selling or administrative activities be excluded from the definition of R & D. Thus, computer software costs as part of these activities are eligible for capitalization.
• to be used as part of processes whose output is products that will be sold, leased, or otherwise marketed to others, or	3. FASB Technical Bulletin No. 79-2 — "Computer Software Costs"	
• to be used in research and development activities	4. SEC moratorium on cost capitalization until consideration by the FASB.	FASB Statement No. 2 and Interpretation No. 6 do not require that all computer software production costs be considered R & D Costs.

product has begun. The process can be either very formal or very informal. If the process if formal, it would normally culminate in the preparation of a product plan which details the product specifications, its market and resource needs. If it is informal, a decision to undertake the construction phase may be made without any formal documentation of the planning and design activities.

During the construction phase, detail program steps are worked out and the program is coded and tested. Although modifications of the software in the construction phase is less likely than during its planning and design, the majority of the modifications in this phase would normally be made at this point. Once the program is· fully coded, the entire system must be tested to ascertain that it operates properly and accomplishes its objectives. The product is then ready for delivery to customers. At this point, the software must be promoted to generate sales and then copies of the program must be produced, packaged and delivered. However, many companies begin their promotional activities before the product is introduced. In

some instances it may begin when the ideal for the product is first conceived. After the product has been delivered, the company normally conducts follow-up activities to ensure that it is running properly. Many times during this stage flaws in the program, not detected earlier, are discovered. This would trigger changes in the program to correct these deficiencies. However, these modifications are normally minor. Also, at this stage minor modifications to update the program to changed conditions are frequently made.

Because of the interdependencies involved in the development and production of software and because of the iterative process involved, it is difficult to determine when R & D ends. This is especially true with respect to development costs. Some individuals would argue that development continues until the software is primarily completed. They believe the uncertainty surrounding the eventual completion of the software and the many modifications at each stage provide a justification for their point of view. The other point of view holds that development is essentially complete once the construction phase begins. Before produc-

tion can start, there must be an agreement on a single alternative. It is acknowledged that design modifications are normally minor. In addition, although there is testing of the programs during the construction phase, the tests are of the product rather than of product alternatives. Adding additional support for this position is an ADAPSO study cited by the Task Force in which the success rates for various computer software products after the initial planning steps was 84% to 95%, while SFAS No. 2 suggested success rates for R & D could be expected to vary between 2% and 25%.

Many of the terms contained in the documents establishing GAAP for computer software costs are not adequately defined. For example, the meaning of the term "higher level of computer software capability" contained in Statement No. 2 and "preproduction model" contained in Interpretation No. 6 are subject to varying interpretations.

The term "higher level software" requires a frame of reference for it to be meaningful. It has been interpreted by some relative to the company's ex-

isting software and by others as relative to software available in the market. As a result, one company could consider their computer development costs as R & D and charge them to expense, while the second company adopting the total market concept can consider them as intangible assets to be capitalized. "Preproduction model" also has multiple interpretations. It could refer to the construction of a working version of the program. However, others would argue the concept of a preproduction prototype is inapplicable to software, so R & D ends with the establishment of a technically feasible alternative.

Once the point at where R & D is assumed to end is selected, it is necessary to decide on whether to expense or capitalize the post R & D costs. Technical Bulletin 79-2 did not provide any guidance in making this decision. Presumably, all of these costs other than actual duplication, promotion and delivery represent the cost of an intangible asset to be amortized over the period in which the software will generate revenue. This treatment would be justified by the definition of an asset contained in Statement of Financial Accounting Concepts No. 3, *Elements of Financial Statements of Business Enterprises.*[8] These costs bear some resemblance to the cost of producing records and motion pictures and a precedent for their capitalization has been established by SFAS Nos. 50[9] and 53.[10]. The cost of duplication and material used to actually produce the product would be a product cost, while the costs of promotion and distribution would fall under the heading of selling expenses.

If the end of R & D is established early in the process, there will be more instances in which the cost of the intangible assets proves to be worthless than when the end to R & D is assumed to occur later in the process. Since a certain number of failures normally accompany the successful software developed, the question of using successful efforts or full cost in accounting for these intangible assets arise.

Current Recommendation for Changes in Accounting for Software Costs

The previous discussion suggests there are major questions that need to be answered before adequate accounting standards for software costs can

be developed. First, guidelines are needed to determine when a software product is sufficiently different from other alternatives that planning and development costs would not be considered R & D. Second, the point in the software development process at which R & D ends and production begins needs to be more clearly specified. Third, the accounting treatment of post R & D costs should be established.

The Computer Software Task Force has recommended to the Accounting Standards Executive committee by a vote of 7 to 0 a series of advisory conclusions. These conclusions deal primarily with the last two questions discussed above. With regard to the question of identifying the point in the process where R & D ends, the task force believes:

- Not all costs in the process are R & D costs.
- It is possible to have non R & D costs to produce a product that precedes the production of a deliverable product that meets design specifications, or before a preliminary working version of the program has been established.
- In most cases establishment of technological feasibility by either construction of a prototype or by other means is a sufficient condition to indicate the end of the research and development phase.
- If technological feasibility is established by reference to activities documented during the planning and design phase, completion of the planning and design phase should mark the end of research and development.
- Research and development actvities that are repeated when the product is primarily in the construction phase should be classified as research and development.

Addressing the question of the treatment of post R & D costs, the task force recommended:

- Construction costs for existing products, as well as new and significantly improved products and enhancements, should be capitalized if recovery is probable. After capitalization, the probability of recovery should be continually reassessed to determine if these costs should continue to be capitalized.

- Existing literature provides adequate guidance for
  - determining when recoverability is probable,
  - determining the types of construction costs that should be capitalized, and
  - calculating amortization.
- Cost incurred for installation, training and maintenance after the product has been introduced should be charged to expense when incurred.

The FASB has responded to requests from the AICPA and the SEC for clarification of their position with the issuance of an exposure draft, "Accounting for the Costs of Computer Software to Be Sold, Leased or Otherwise Marketed." The exposure draft is intended to cover software developed for external distribution either as a separate program, a group of programs or as a product enhancement. It specifically excludes software created for internal use or for others under a contractual arrangement.

In the exposure draft the board has specified that companies are required to capitalize the costs incurred for

coding, testing and producing product masters after it determines that:

- Recovery of the costs is probable, by meeting specified criteria that establish market, financial, and technological feasibility.
- It has or can obtain the resources to produce and market the product and is committed to doing so.

To establish technological feasibility a firm must document that it has completed all activities necessary for the production of the product according to its design specification and that the cost of the production can be reliably estimated. Market feasibility requires a firm to demonstrate through a market analysis the existence of a market for the software product. Finally, financial feasibility requires that the capitalized cost be less than the estimated future revenues minus any estimated additional cost of producing, marketing and maintaining the product.

All other costs are to be charged to expense as incurred. This includes all planning and design costs prior to the establishment of technological, market and financial feasibility, as well as post sale costs for maintenance of the product and customer support. The FASB exposure draft also included purchas-

ed software that will be sold, leased or otherwise marketed. For purchased software capitalization of its acquisition cost is specified as long as it meets the same criteria for recoverability as developed software.

A brief comparison of the FASB exposure draft with the AICPA Task Force's recommendation reveals that the Board's position is in conformity with the AICPA recommendations. Both agree that not all costs in the software development process should be considered R & D costs as defined by Statement No. 2. However the task force recommendations tend to be more concerned with identifying the point at which technological feasibility is established. In addition both documents emphasize the probability of cost recovery as a necessary condition for capitalization and stress the need for continual reevaluation of the recoverability criterion.

Conclusion

This paper has discussed several of the problems in generally accepted accounting principles applied to software costs. These problems have resulted in variability among firms in their treatment of these costs. A large part of the reason for the difficulty appears to be

the result of the fact that the complexity of the software development process was not adequately considered when FASB Statement No. 2, Interpretation No. 6, and Technical Bulletin 79-2 were issued. As a result of the Ac SEC task force's recommendations and the SEC's moratorium which precludes changes in accounting policies related to software costs, the FASB accepted the responsibility of determining the proper accounting for software costs. The conclusions reached in the exposure draft would definitely change the predominant practice of firms expensing all costs of developing and producing software.

Having received 176 comment letters on the exposure draft, the FASB plans to hold a public hearing in late March or April, 1985. Approximately July 1, 1985, a new document will be issued which could be a new exposure draft or a final statement. Therefore, it appears that the accounting for software costs will be a "hot topic" for most of 1985. Ω

William R. Cron, Ph.D., CMA, *is associate professor of accounting at Central Michigan University in Mt. Pleasant. He holds a Ph.D. from Michigan State University and is a member of the AAA. Dr. Cron is the author of a number of articles in various professional journals.*

Thomas R. Weirich, Ph.D., CPA, *is professor of accounting at Central Michigan University in Mt. Pleasant. He is the author of a number of articles in various professional journals and a co-author of the text entitled* Accounting and Auditing Research: A Practical Guide.

NOTES

[1] "News Report" *Journal of Accountancy,* June, 1983, p. 9.

[2] Accounting Standards Executive Committee's Task Force on Accounting for the Development and Sale of Computer Software, "Issues Paper," *Minutes of Accounting Standards Executive committee,* December 8, 1983, (AICPA: New York, 1984).

[3] Financial Accounting Standards Board *Exposure Draft: Accounting for the Costs of Computer Software to be Sold, Leased or Otherwise Marketed,* (Stamford: FASB, August 31, 1984).

[4] Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 2: Accounting for Research and Development Costs,* (Stamford: FASB, October 1974).

[5] Financial Accounting Standards board, *Interpretation No. 6: Applicability of FASB Statement No. 2 to Computer Software,* (Stamford: FASB, February, 1975).

[6] Financial Accounting Standards Board, *Technical Bulletin 79-2: Computer Software Costs,* (Stamford: FASB, December, 1979).

[7] Many of these problems are addressed in detail in the Task Force's "Issues Paper," Minutes of AcSEC, December 8, 1983.
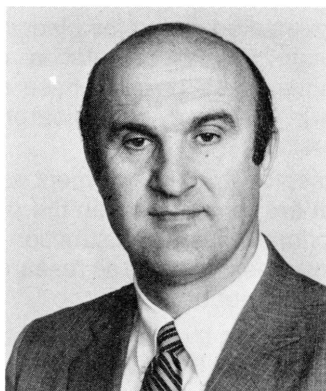
[8] Financial Accounting Standards Board, *Statement of Financial Accounting Concepts No. 3: Elements of Financial Statements of Business Enterprises* (Stamford: FASB, December, 1980).

[9] Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 50: Financial Reporting in the Record and Music Industry,* (Stamford: FASB, November, 1981).

[10] Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 53: Financial Reporting by Producers and Distributors of Motion Picture Films,* (Stamford: FASB, December, 1981).