Accounting for Computer Software Development Costs

Computer software companies spend high amounts each year on developing new products. Is such spending an expense or does it create an intangible asset? Managers, investors, academics, and regulators have extensively debated this question. Expensing these outlays reduces current period profits, and, in subsequent periods, when the new software products are introduced and sold, increases reported profits. Start-up companies, with no products to sell initially, report high losses as initial software development costs are expensed. Some observers believed that expensing software development costs could deter the formation and growth of these entrepreneurial organizations.

Those who advocate that software development spending creates an asset point to the benefits produced in future periods. For an asset to be recognized, however, managers and auditors must verify the following:

- the expenditure has created probable future economic benefits, and

- the entity can capture those benefits and control other's access to them

Even when the spending has met these criteria, managers still need to determine:

- the costs attributable to the asset

- the useful life of the created asset

- the pattern of relating the costs to future revenues

In the United States, practitioners initially tried to apply Statement of Financial Accounting Standard No. 2 (SFAS No. 2), "Accounting for Research and Development Costs", issued by the Financial Accounting Standards Board (FASB) in 1974, to account for computer software development. But SFAS ultimately failed to provide satisfactory guidelines for the treatment of these costs. Because there had been varying interpretations of SFAS No. 2, the FASB issued Interpretation No. 6 (FIN 6), "Applicability of FASB Statement No.2 to Computer Software". However, several practitioners rejected this interpretation. Finally, in 1985 the FASB issued SFAS No. 86 to deal explicitly with the accounting of costs for computer software to be sold, leased or otherwise marketed. More than a decade later the American Institute of Certified Public Accountants (AICPA) completed the work by issuing Statement of Position, SOP 98-1, "Accounting for the Costs of Computer Software Developed or Obtained for Internal Use".

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The International Accounting Standards Committee (IASC)[1] followed a different path. Instead of defining specific rules for the accounting of software development costs, the IASC adopted a more general statement that provided guidelines for the accounting for all intangible assets. The IASC setters required capitalization of intangible assets if the criteria for recognition of an asset were satisfied.

Development of U.S. Accounting Standards for Computer Software Costs

Statement of Financial Accounting Standard (SFAS) No.2, "Accounting for Research and Development Costs" (1974)

Prior to 1974, financial reporting practices for R&D expenditures differed considerably across companies. No clear standards existed on what constituted R&D costs or on how to account for R&D expenditures, which exceeded $30 billion in 1973. Managers in some companies expensed R&D costs as incurred while others capitalized and amortized them over time. Different definitions and treatments led to comparison problems among companies.

The Financial Accounting Standards Board (FASB), wishing to reduce the diversity of reporting practices, issued SFAS No. 2 in 1974 to standardize R&D accounting. The standard defined research and development activities:

> *Research* is planned search aimed at discovery of new knowledge 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* is the translation 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 does not include routine or periodic alterations to existing products or processes, nor does it include market research or market-testing activities.

The costs to be included in Research and Development activities included:

- *Costs of materials, equipment and facilities* expected to be used for research and development activities, or *intangibles purchased from others* for use in research and development activities. [2]

- *Costs of personnel and contract services*

- *Indirect costs* whenever they can be reasonably allocated and clearly related to research and development activities.

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[1] The International Accounting Standards Committee (IASC), a private organization with members from all over the world, was established in 1973 to eliminate alternative accounting treatments abroad. The IASC was superseded by the International Accounting Standards Board (IASB) following a restructuring of the institution.

[2] If these assets have no alternative future uses they are expensed at the time they are acquired or constructed. If instead, they have alternative future uses, they are capitalized and amortized or depreciated.

After agreeing on these definitions, the FASB decided that all research and development costs must be charged to expense when incurred. Also, the annual amount of R&D expense charged to earnings should be disclosed in a footnote. The board members argued that R&D costs were not an asset given:

- the uncertainty of future benefits

- the inability to measure future benefits with a reasonable degree of certainty

- the lack of a causal relationship between expenditures and benefits

One year later, in 1975, the FASB issued Interpretation No. 4 (FIN 4) to clarify the applicability of the SFAS No. 2 to business combinations (acquisitions) accounted as a purchase. FASB stated that all costs from the purchase of a business should be assigned to all identifiable tangible and intangible assets, including any costs resulting from R&D activities. Costs should be determined from the amount paid by the acquiring enterprise, rather than from the original cost. The subsequent accounting of these costs should be determined by reference to SFAS No. 2. Therefore, any costs assigned to in-process R&D projects had to be charged to expense unless they had an alternative use.

SFAS No. 2 and FIN 4 generated much controversy among practitioners and academics. Many claimed that the FASB standard ignored the nature of R&D expenditures and would deter future economic growth. Several submissions to the FASB by managers of capitalizing firms indicated that they would reduce their R&D commitments under the new standard. Subsequent research, however, could find no decrease in R&D attributable to SFAS No. 2.[3]

Software Industry Concerns

More compelling complaints emerged from the computer software industry. The FASB standard and explanations about what constituted R&D were confusing and left open the question of whether computer software development costs should be treated as R&D or capitalized as an asset. In 1975 the FASB issued an interpretation, referred to as FIN 6, to clarify the applicability of SFAS No. 2 to computer software development costs.[4] FIN 6 stated that costs incurred for the development of new software would be considered R&D costs whenever they created a new or significantly improved product or process:

- to be sold, leased or otherwise marketed

- to be used as a part of a product or process whose output would be sold leased or otherwise marketed

- to be used in other R&D activities.

Other costs, including those for programming and testing software, would also be considered R&D costs when they involved searching for or evaluating product or process alternatives or designing pre-production models. Thus, FIN 6 affirmed the applicability of its R&D standard by requiring the expensing of R&D costs incurred to create software.

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[3] Dukes, Roland E., Thomas R. Dyckman and John A. Elliot, "Accounting for Research and Development Costs: The Impact on Research and Development Expenditures," *Journal of Accounting Research*: 1980.

[4] FASB Interpretation No.6, "Applicability of FASB Statement No.2 to Computer Software, an interpretation of FASB Statement No.2". February, 1975.

Managers and controllers from the software industry disagreed with FIN 6's strong bias toward expensing computer software costs. A statement from the Association of Data Processing Services Organization (ADAPSO) claimed:

> … the FASB has not properly considered the nature of software product construction, has not properly evaluated the historical risk associated with software products, has rationalized away the importance of long-standing generally accepted accounting principles, and has issued a ruling which may cause significant distortion in the financial reports of companies engaged in the construction of software.[5]

Software industry representatives argued that the FASB's position understated the software products industry's assets. The discussion and disagreement extended into the mid-1980s.

Statement of Financial Accounting Standard (SFAS) No. 86, "Accounting for the Costs of Computer Software to be Sold, Leased and Otherwise Marketed" (1985)

In the 1980s, the FASB conceded that not all computer software development costs should be treated as R&D costs under SFAS No. 2. It concluded that while some activities in the software development process corresponded to its definitions of research and development, others did not.

The FASB issued SFAS No. 86 in August 1985 to clarify the accounting treatment for software development activities. The standard established the following definitions and accounting rules for software development costs:

a. *Research and Development Costs:* All costs incurred to establish the technological feasibility of a computer software product to be sold, leased or otherwise marketed are research and development costs, and therefore should be expensed.

b. *Production Costs:* Subsequent costs of producing product masters shall be capitalized following (i) the establishment of technological feasibility for the software, and (ii) the completion of all research and development activities for the other components of the product or process.

c. *Maintenance and Customer Support*: Capitalization of computer software costs shall cease when the product is available for general release to customers. Subsequent costs of maintenance and customer support shall be charged to expense when related revenue is recognized or when those costs are incurred, whichever occurs first.

According to the SFAS No. 86,

> The t*echnological feasibility* of a computer software product is established when the enterprise has completed all planning, designing, coding and testing activities that are necessary to establish that the product can be produced to meet its design specifications including functions, features, and technical performance requirements.

Exhibit 1 shows the time line for accounting for software development expenses at different stages of the product's life cycle,

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[5]   As cited by Burns, Gary W. and D. Scott Peterson. Accounting for Computer Software. An analysis of the confusion caused by GAAP for computer software development costs. Journal of Accountancy. April 1982.

SFAS No. 86 required capitalized software costs to be amortized on a product-by-product basis, starting when the product was available for general release to customers (see Exhibit 1). The amount amortized each year shall be the greater of

a. $\frac{\text{current gross revenue}}{\text{total expected gross revenues}}$ x book value of capitalized software

where total expected gross revenue includes current and anticipated future gross revenues for the product, and

b.   the amortization of the amount corresponding to using the straight-line method over the remaining estimated economic life of the product, including the current period.

Companies must disclose:

- the unamortized computer software costs in each balance sheet presented, and

- the total amount charged to expense in each income statement presented: ~~, for~~ both amortization of capitalized computer software costs and ~~for~~ amounts written down to net realizable value.

Response to SFAS No. 86

SFAS No. 86 attenuated the debate about computer software development costs accounting, but controversy continued. Some practitioners and standard setters complained about the lack of conservatism under capitalization and the great degree of management discretion and interpretation introduced by the standard. Investors argued that spending on software development was no guarantee of future earnings and that companies could initially over-inflate earnings and later take large write-offs.

Statement of Position (S0P) 98-1, "Accounting for the Costs of Computer Software Developed or Obtained for Internal Use (1988)

While SFAS No. 86 clarified the accounting treatment for computer software intended to be sold, leased or otherwise marketed, the standard had not addressed the costs of developing software for internal use. This confusion existed before 1985, but the FASB had concluded that the costs of software used internally were not a significant problem and decided not to broaden the scope of SFAS No. 86 to include them. The lack of authoritative guidance in accounting for software developed for internal use led to an increasing diversity of practices.

More than ten years later, the American Institute of Certified Public Accountants (AICPA) issued a Statement of Position, SOP 98-1, *Accounting for the Costs of Computer Software Developed or Obtained for Internal Use*, in March 1998.[6] The SOP proposed that certain costs related to the development or purchase of internal-use software be capitalized and amortized over their estimated useful life. Costs

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[6] An AICPA Statement of Position (SOP) is issued for general information of those interested in the subject. It presents the conclusions of at least a majority of the Accounting Standards Executive Committee (AcSEC), which is the senior technical body of the AICPA authorized to speak in the areas of financial accounting and reporting and cost accounting. A Statement of Position is supposed to influence accounting and reporting standards, but it does not establish a standard enforceable under the AICPA's Code of Professional Ethics.

incurred in connection with R&D projects, in the preliminary project stage of the software development, or in maintenance should be expensed.

By the end of the 1990s and despite all the lobbying in favor of capitalization that software firms had done in the 1980s, most large software companies were expensing 100% of their software development costs each year (see **Exhibit 2**). They argued that the amount subject to capitalization was immaterial.

International Accounting Standards

The International Accounting Standards Committee (IASC)[7], took a different approach than the FASB. It decided to allow capitalization of the development component of R&D expenditures if recoverable in IAS 9, its first standard about research and development costs. Under this approach, the accounting treatment of computer software development costs was not distinguished from the treatment of development costs in other industries.

The IASC continued to work to generalize this standard, an effort that culminated in July 1998 with issuance of IAS 38, a broad statement applying to expenditures on intangible assets, including advertising, training, start-up and research and development activities, including software development. The standard defined an intangible asset as:

an identifiable non-monetary resource without physical substance controlled by an enterprise, from which future economic benefits are expected to flow to the enterprise.

IAS 38 specified the circumstances in which R&D could be capitalized and, conversely, when it must be treated as an expense and written off in the income statement. According to the statement, research and development activities give rise to "internally generated intangible assets." An enterprise should classify the generation of such assets into a research phase and a development phase, and should treat costs according to this classification:

a. Research Phase: No intangible asset arising from research should be recognized. Expenditures on research should be recognized as an expense when they are incurred.

b. Development Phase: An intangible asset arising from development should be recognized if, and only if, an enterprise can demonstrate:

i. the technical feasibility of completing the asset so that it will be available for use or sale

ii. its intention to complete the intangible asset and use or sell it

iii. its ability to use or sell the intangible asset

iv. how the intangible asset will generate probable future economic benefits

v. the availability of resources to complete the development and use or sell the asset, and

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[7] The International Accounting Standards Committee (IASC), a private organization with members from all over the world, was established in 1973 to eliminate alternative accounting treatments abroad. The IASC was superseded by the International Accounting Standards Board (IASB) following a restructuring of the institution.

> vi. its ability to reliably measure the expenditure attributable to the development of the asset.
>
> c. Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance should not be recognized as intangible assets.

Subsequent expenditures on an intangible asset after its completion would be recognized as an expense as incurred unless the company considered it probable that such expenditures enable the asset to generate future economic benefits in excess of its originally assessed standard of performance. Also the expenditures had to be measured and attributed to the asset reliably. If these conditions were met, the subsequent expenditure should be capitalized and added to the cost of the intangible asset. Capitalized development costs, like any other tangible or intangible asset, would be amortized over their estimated useful lifetime, and written down to realizable value if impaired.

The amortization method used should reflect the pattern in which the asset's economic benefits are consumed by the firm. IAS 38 allowed a variety of amortization methods including the straight-line method, the diminishing balance method, and the unit of production method. The standard recommended the useful life of intangible assets should not exceed 20 years, it confirmed that intangible assets should be amortized over the best estimate of their useful life. The residual value should be assumed to be zero, unless there was a commitment by a third party to purchase the asset at the end of its useful life, or an objective way in which the residual value could be calculated by reference to an active market.

IAS 38 stated that if an asset was acquired in an acquisition, the cost of that intangible asset should be based on its fair value at the date of the acquisition. If an intangible asset could not be measured reliably, that asset should be included in goodwill, and not recognized as a separate intangible asset.

Financial statements would disclose the aggregate amount of research and development expenditure expensed that period. For capitalized R&D, financial statements would also disclose:

a. the useful lives

b. the amortization methods

c. the gross carrying amount and the accumulated amortization at the beginning and end of the period

d. the line item(s) of the income statement in which the amortization of intangible assets is included

e. a reconciliation of the carrying amount at the beginning and end of the period.

Summary

The treatment of software development costs has undergone a tortuous history. After much debate, standard setters both in the US and internationally have given companies the option to capitalize development costs that meet definitive standards, such as proof of technological feasibility. At least in the US, however, few major companies are choosing to classify any portion of their software development costs as meeting the standard for capitalization.

Exhibit 1   Timeline for accounting for costs of computer software developed to be sold, leased or otherwise marketed.
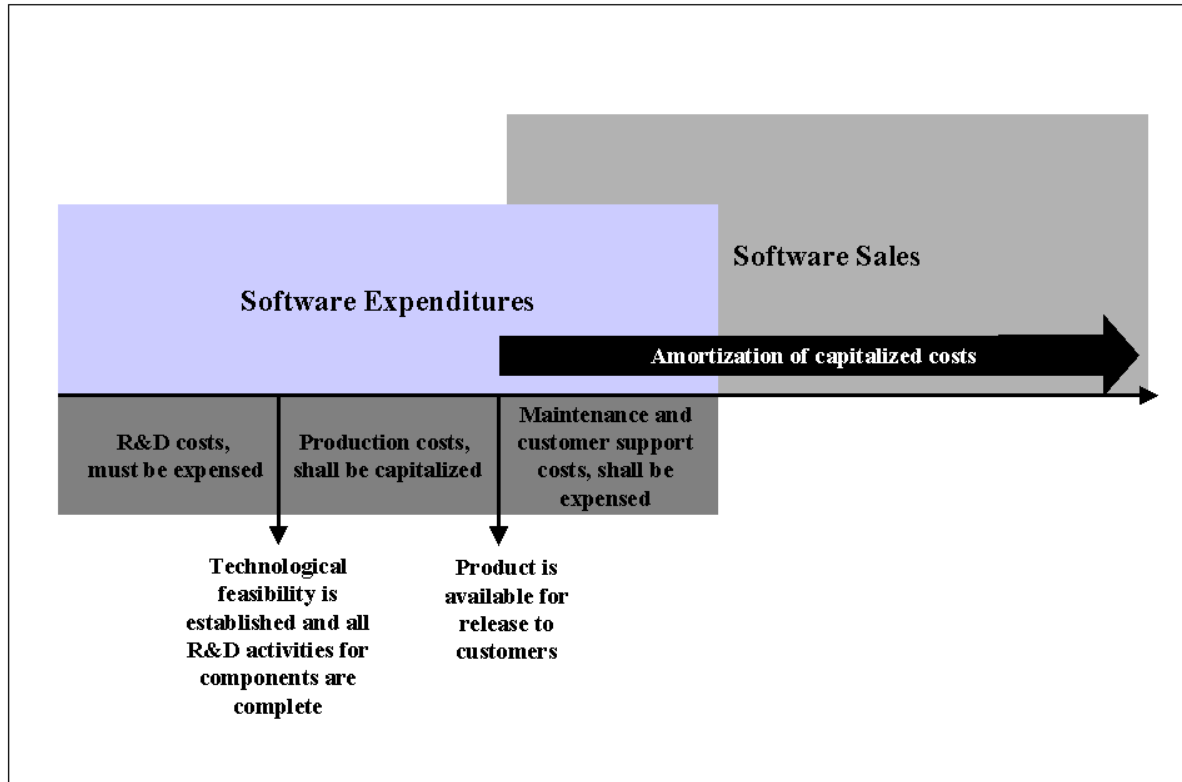
Exhibit 2 R&D expense and software development costs on Major Software Companies in 1999

Company Name	Net Sales (MM$)	R&D Expense (MM$)	Capitalized internally-generated software development costs (MM$)
Microsoft	19,747	2,970	0 (c)
IBM	12,662 (a)	2,086 (a)	656 (b)
Oracle	10,130	1,010	95
Computer Associates	6,103	1,363	36
SAP Ag -ADR	5,146	750	0 (c)
Compuware	2,231	99	14
BMC Software	1,719	294	193
Peoplesoft	1,429	297	27
Electronic Arts	1,420	267	0 (d)
Novell	1,273	228	0 (c)
Cadence Design Systems	1,093	219	11
Parametric Technology	1,058	162	0 (c)
Adobe Systems	1,015	201	0 (c)
J D Edwards	944	135	0
Informix	872	163	45 (e)
Sybase	872	136	36
Intuit	847	143	0
Sterling Software	807	123	144 (e)
Synopsys	806	188	0 (c)
Siebel Systems	790	73	0 (d)
Networks Associates	684	148	0 (d)
Veritas Software	596	199	0 (c)
I2 Technologies	571	132	0 (d)
Bea Systems Inc	464	61	0 (d)
Citrix Systems Inc	403	40	0 (c)

Sources: 10-K reports and Compustat Database: Annual reports issued between June 1999 and May 2000
(a)   Includes only software related sales and R&D expense.
(b)   Includes software related R&D expense plus capital expenditures in the software business.
(c)   The company claims that the internally generated software costs that could be capitalized under FAS86 statement are insignificant (immaterial).
(d)   Company claims that establishment of technological feasibility substantially coincides with the general release of the corresponding software, so software development costs qualifying for capitalization under FAS 86 are insignificant.
(e)   Includes other items such as purchased software and outside development products that reached technological feasibility.
(f)   Most companies claim that acquired in-process research and development had not yet reached technological feasibility, and therefore the value assigned to in-process R&D was expensed.
Note: US accounting standards do not apply to immaterial items