

AGENDA — May 29, 2002 Business Taxes Committee Meeting
Proposed Regulatory Changes Regarding Optional Software Maintenance Agreements
Regulation 1502, Computer, Programs and Data Processing

<p>Action 1 — Consent Items</p> <p>Agenda, page 9.</p> <p>Agenda, pages 2-7 and 10-12.</p> <p>Agenda, pages 3 and 11.</p>	<p>Adopt proposed amendments as agreed upon by staff and Industry to:</p> <ul style="list-style-type: none"> • Provide, in subdivision (f)(1)(C), that 50 percent of the lump-sum charge for an optional software maintenance agreement is a taxable sale of tangible personal property and the remaining 50 percent is a nontaxable charge for repairs. • Make nonsubstantive changes throughout the regulation to reformat text for consistency and clarity, and to delete obsolete references. • Conform the definition and discussion of digital pre-press instruction in subdivisions (b)(6) and (f)(2)(F) to the regulatory language previously adopted by the Board in Regulations 1540, <i>Advertising Agencies and Commercial Artists</i>, and 1541, <i>Printing and Related Arts</i>.
<p>Action 2 — Authorization to Publish</p>	<p>Recommend the publication of the proposed amendments to Regulation 1502 as adopted in the above actions.</p> <p>Operative Date: None Implementation: 30 days following approval by the Office of Administrative Law.</p>

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Proposed Regulatory Changes Regarding Optional Software Maintenance Agreements
Regulation 1502, Computer, Programs and Data Processing

Action Item	Staff and Industry's Proposed Regulatory Language
<p>Action 1 – Consent Items</p>	<p>Regulation 1502. Computers, Programs, and Data Processing.</p> <p><i>Reference:</i> Sections 995.2, 6006, 6007, 6010, 6010.9, 6011, 6012, 6015, and 6016, Revenue and Taxation Code.</p> <p>(a) IN GENERAL. “Automatic data processing services” are those rendered in performing all or part of a series of data processing operations through an interacting assembly of procedures, processes, methods, personnel, and computers.</p> <p>Automatic data processing services may be provided by manufacturers of computers, data processing centers, systems designers, consultants, software companies, etc. In addition, there are banks and other businesses which own or lease computers and use them primarily for their own purposes but occasionally provide services to others. Businesses rendering automatic data processing services will be referred to herein as “data processing firms.”</p> <p>(b) DEFINITIONS OF TERMS.</p> <p>Additional copies..... See (d)(5)(F).</p> <p>(1) Application<u>APPLICATION.</u>The specific job performance by an automatic data processing installation—is referred to as an application. For example, data processing for a payroll may be referred to as a payroll application.</p> <p>(2) Coding<u>CODING.</u>The list, in computer code, of the successive computer instructions representing successive computer operations for solving a specific problem.</p> <p>(3) Computer<u>COMPUTER.</u>A computer is an electronic device (including word processing equipment and testing equipment) or combination of components, which is programmable and which includes a processor (central processing unit or microprocessor), internal memory, and input and output connections. Manufacturing equipment which incorporates a computer is a computer for purposes of this regulation. However, the term does not include manufacturing equipment which operates under the control of mechanical or electronic accessories, the attachment of the equipment of which is required for the machine to operate. An electronic device otherwise qualifying as a computer remains a computer even though it may be used for information processing, data acquisition, process control, or for the control of manufacturing machinery or equipment.</p> <p>(4) Custom computer..... program and programming<u>CUSTOM COMPUTER PROGRAM AND PROGRAMMING.</u> —A computer program prepared to the special order of the customer. A program prepared to the special order of the customer</p>

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	<p>qualifies as a custom program even though it may incorporate preexisting routines, utilities, or similar program components. It includes those services represented by separately stated charges for modifications to an existing prewritten program which are prepared to the special order of the customer.</p> <p>_____ (5) Data Entry..... (including Encoding) <u>DATA ENTRY (INCLUDING ENCODING).</u> Recording information in or on storage media by punching holes or inserting magnetic bits to represent letters, digits, and special characters.</p> <p>Electronic or Digital Pre-Press Instruction. Within the printing industry, the transfer by computer disk or other electronic storage media of original information created by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output to film, plate, or direct to press.</p> <p><u>(6) DIGITAL PRE-PRESS INSTRUCTION.</u> The creation of original information in electronic form by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output, within the printing industry, to film, plate, or direct to press, which is then transferred on electronic media such as tape or compact disc.</p> <p>_____ (7) Input <u>INPUT.</u>—The information or data transferred, or to be transferred, from storage media into the internal storage of the computer.</p> <p>Keystroke..... Verifying. — Use of a machine known as a punched card verifier or tape transcriber, which has a keyboard, to ensure that information punched in or transcribed on storage media during the keypunching operation has been entered properly. The machine signals when the punched hole and the depressed key disagree, or when the data on storage media differs from depressed keys.</p> <p>Off Line..... Descriptive of a system and the devices in a system in which the operation of equipment is not under the control of a computer.</p> <p>On Line..... Descriptive of a system and the devices in a system in which the operation of such equipment is under control of a computer.</p> <p>_____ (8) Output <u>OUTPUT.</u>—The information transferred from the internal storage of the computer to storage media or tabulated listing.</p> <p>_____ (9) Prewritten. Program <u>PREWRITTEN PROGRAM.</u> —A program held or existing for general or repeated sale or</p>

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	<p>lease. The term also includes a program developed for in-house use which is subsequently offered for sale or lease as a product.</p> <p>Processing of Customer Furnished Information. — See (d)(5).</p> <p>(10) Program<u>PROGRAM.</u> —The complete plan for the solution of a problem, i.e., the complete sequence of automatic data processing equipment instructions necessary to solve a problem; includes both systems and application programs and subdivisions such as assemblers, compilers, routines, generators, and utility programs.</p> <p>(11) Proof Listing<u>PROOF LISTING.</u> —A tabulated listing of input.</p> <p>(12) Source Documents<u>SOURCE DOCUMENTS.</u> —A document supplied by a customer of a data processing firm from which basic data are extracted (e.g., sales invoice).</p> <p>(13) Storage media<u>STORAGE MEDIA.</u> —Includes hard disks, floppy disks, diskettes, magnetic tape, cards, paper tape, drums, and other devices upon which information is recorded.</p> <p>(c) BASIC APPLICATIONS OF TAX.</p> <p>(1) The transfer of title, for a consideration, of tangible personal property, including property on which or into which information has been recorded or incorporated, is a sale subject to tax.</p> <p>(2) Charges for producing, fabricating, processing, printing, imprinting, or otherwise physically altering, modifying or treating consumer-furnished tangible personal property (cards, tapes, disks, etc.), including charges for recording or otherwise incorporating information on or into such tangible personal property, are generally subject to tax.</p> <p>(3) A transfer for a consideration of the title or possession of tangible personal property which has been produced, fabricated, or printed to the special order of the customer, including property on which or into which information has been recorded or incorporated, is generally a sale subject to tax. However, if the contract is for the service of researching and developing original information for a customer, tax does not apply to the charges for the service. The tangible personal property used to transmit the original information is merely incidental to the service.</p> <p>(4) Charges for the transfer of computer-generated output are subject to tax where the true object of the contract is the output and not the services rendered in producing the output. Examples include artwork, graphics, and designs. However,</p>

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	<p>the transfer by the seller of the original information created by electronic or digital pre-press instruction is not subject to tax if the original information is a custom computer program as explained in <u>subdivision (f)(2)(F)</u>.</p> <p>(5) Charges for processing customer-furnished information (sales data, payroll data, etc.) are generally not subject to tax. (For explanation and specific application of tax, see <u>subdivision (d)</u>below.)</p> <p>(6) Leases of tangible personal property may be subject to tax under certain conditions. (See Regulation 1660 for application of tax to leases.)</p> <p>(7) Charges made for the use of a computer, on a time-sharing basis, where access to the computer is by means of remote telecommunication are not subject to tax. (See <u>subdivision (i)</u>below.)</p> <p>(8) Generally data processing firms are consumers of all tangible personal property, including cards and forms, which they use in providing exempt nontaxable services unless a separate charge is made to customers for the materials, in which case tax applies to the charge made for the materials.</p> <p>(d) MANIPULATION OF CUSTOMER-FURNISHED INFORMATION AS SALE OR SERVICE.</p> <p>(1) GENERAL. Generally tax applies to the conversion of customer-furnished data from one physical form of recordation to another physical form of recordation. However, if the contract is for the service of developing original information from customer-furnished data, tax does not apply to the charges for the service. The tangible personal property used to transmit the original information is merely incidental to the service.</p> <p>(2) DATA ENTRY AND VERIFICATION. This section covers situations where a data processing firm's agreement provides only for data entry, data verification, and proof listing of data, or any combination of these operations. It does not include contracts under which these services are performed as steps in processing of customer-furnished information as discussed under <u>subdivision (d)(5)</u>.</p> <p>Agreements providing solely for data entry and verification, or data entry, providing a proof list and/or verifying of data are regarded as contracts for the fabrication of storage media and sales of proof lists. Charges therefor are taxable, whether the storage media are furnished by the customer or by the data processing firm.</p> <p>Tax also applies to charges for the imprinting of characters on a document to be used as the input medium in an optical character recognition system. The tax application is the same regardless of which type of storage media is used in the operation.</p>

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	<p>(3) ADDRESSING (INCLUDING LABELS) FOR MAILING. Where the data processing firm addresses, through the use of its computer or otherwise, material to be mailed, with names and addresses furnished by the customer or maintained by the data processing firm for the customer, tax does not apply to the charge for addressing. Similarly, where the data processing firm prepares, through the use of its computer or otherwise, labels to be affixed to material to be mailed, with names and addresses furnished by the customer or maintained by the data processing firm for the customer, tax does not apply to the charge for producing the labels, regardless of whether or not the data processing firm itself affixes the labels to the material to be mailed. (For the Ssale of mailing list by the proprietor of such list, as a sale of tangible personal property or as an exempt nontaxable addressing, see Regulation 1504 "Mailing Services.")</p> <p>(4) MICROFILMING AND PHOTORECORDING. Tax applies to charges for microfilming or photorecording except, as provided in paragraph subdivision (d)(5), where the microfilming or photorecording is done under a contract for the processing of customer-furnished information. Tax applies to a contract where data on magnetic tape are converted into combinations of alphanumeric printing, curve plotting and/or line drawings, and put on microfilm or photorecording paper.</p> <p>(5) PROCESSING OF CUSTOMER-FURNISHED INFORMATION.</p> <p>(A) "Processing of customer-furnished information" means the developing of original information from data furnished by the customer. Examples of automatic data processing processes which result in original information are summarizing, computing, extracting, sorting, and sequencing. Such processes also include the updating of a continuous file of information maintained by the customer with the data processing firm.</p> <p>(B) "Processing of customer-furnished information" does not include: (1) an agreement providing solely for the reformatting of data or for the preparation of a proof listing or the performance of an edit routine or other pre-processing, (2) the using of a computer as a mere printing instrument, as in the preparation of personalized computer-printed letters, (3) the mere converting of data from one medium to another, (4) an agreement under which a person undertakes to prepare artwork, drawings, illustrations, or other graphic material unless the provisions of <u>subdivision (f)(2)(F)</u> apply regarding digital or electronic pre-press instruction and custom computer programs. Additionally, graphic material furnished incidentally to the performance of a service is not subject to tax. For example, graphics furnished in connection with the performance of architectural, engineering, accounting, or similar professional services are not subject to tax. With respect to typography, clip art, combined with text on the same page is considered composed type as explained in Regulation 1541.</p> <p>(C) Contracts for the processing of customer-furnished information usually provide that the data processing firm will receive the customer's source documents, record data on storage media, make necessary corrections, process the</p>

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	<p>information, and then record and transfer the output to the customer.</p> <p>Where a data processing firm enters into a contract for the processing of customer-furnished information, the transfer of the original information to the customer is considered to be the redaction<u>rendering</u> of a service. Except as described in <u>subdivisions (c)(8) above</u> and (d)(5)(E) below, tax does not apply to the charges made under contracts providing for the transfer of the original information whether the original information is transferred on storage media, microfilm, microfiche, photorecording paper, input media for an optical character recognition system, punched cards, preprinted forms, or tabulated listing. The breakdown of the total charge into separate charges for each operation involved in processing the customer-furnished information will not change the application of tax.</p> <p>(D) The furnishing of computer programs and data by the customer for processing under direction and control of the data processing firm will not alter the application of tax, notwithstanding that charges are based on computer time.</p> <p>(E) Taxable Items. Where a data processing firm has entered into a contract which is regarded as a service contract under paragraph subdivision (d)(5)(C) above and the data processing firm, pursuant to the contract, transfers to its customer tangible property other than property containing the original information, such as: duplicate copies of storage media; inventory control cards for use by the customer; membership cards for distribution by the customer; labels (other than address labels); microfiche duplicates; or similar items for use, tax applies to the charges made for such items. If no separate charge is made, tax applies to that portion of the charge made by the data processing firm which the cost of the additional computer time (if any), cost of materials, and labor cost to produce the items bear to the total job cost.</p> <p>(F) Additional Copies. When additional copies of records, reports, tabulation, etc., are provided, tax applies to the charges made for the additional copies. "Additional copies" are all copies (other than carbon copies), whether the copies are prepared by rerunning the same program, by using multiple simultaneous printers, by looping a program such that the program is run continuously, by using different programs to produce the same output product, or by other means. Where additional copies are prepared the tax will be measured by the charge made by the data processing firm to the customer. If no separate charge is made for the additional copies, tax applies to that portion of the gross receipts which the cost of the additional computer time (if any), the cost of materials and labor cost to produce the additional copies bear to the total job cost. Charges for copies produced by means of photocopying, multi-lithing, or by other means are subject to tax.</p> <p>(e) TRAINING SERVICES AND MATERIALS. Data processing firms provide a number of training services, such as data entry and verification, programming, and specialized training in systems design.</p> <p>(1) Charges for training services are nontaxable, except as provided in <u>subdivision (g) below</u> where the training services</p>

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	<p>are provided as part of the sale of tangible personal property. The data processing firm is the consumer of tangible personal property which is used in training others, or provided to trainees without a separate charge as a part of the training services.</p> <p>(2) Tax applies to charges for training materials, including books, furnished to trainees for a charge separate from the charge for training services.</p> <p>(3) Where a person sells tangible personal property, such as computers or programs, and provides training materials to the customer without making an additional charge for the training materials, this is a sale of the training materials. The selling price of the training materials is considered to be included in the sales price of the tangible personal property.</p> <p>(f) COMPUTER PROGRAMS.</p> <p>(1) PREWRITTEN (CANNED) PROGRAMS. Prewritten programs may be transferred to the customer in the form of storage media or by listing the program instructions on coding sheets. In some cases they are usable as written; however, in other cases it is necessary that the program be modified, adapted, and tested to meet the customer's particular needs. Tax applies to the sale or lease of the storage media or coding sheets on which or into which such prewritten (canned) programs have been recorded, coded, or punched.</p> <p>(A) Tax applies whether title to the storage media on which the program is recorded, coded, or punched passes to the customer, or the program is recorded, coded, or punched on storage media furnished by the customer. The temporary transfer of possession of a program, for a consideration, for the purpose of direct use or to be recorded or punched by the customer, or by the lessor on the customer's premises, is a lease of tangible personal property. The tax applies unless the property is leased in substantially the same form as acquired by the lessor and the lessor has paid sales tax reimbursement or use tax with respect to the property.</p> <p>(B) Tax applies to the entire amount charged to the customer. Where the consideration consists of license fees, all license fees, including site licensing and other end users fees, are includable in the measure of tax. Tax does not apply, however, to license fees or royalty payments that are made for the right to reproduce or copy a program to which a federal copyright attaches in order for the program to be published and distributed for a consideration to third parties, even if a tangible copy of the program is transferred concurrently with the granting of such right. Any storage media used to transmit the program is merely incidental.</p> <p>(C) Maintenance contracts sold in connection with the sale or lease of prewritten computer programs generally provide that the purchaser will be entitled to receive, during the contract period, storage media on which prewritten program</p>

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	<p>improvements or error corrections have been recorded. The maintenance contract also may provide that the purchaser will be entitled to receive, during the contract period, telephone or on-site consultation services.</p> <p>If the purchase of the maintenance contract is not optional with the purchaser, <u>that is, if the purchaser must purchase the maintenance contract in order to purchase or lease a prewritten computer program,</u> then the charges for the maintenance contract are taxable, including charges for consultation services, as part of the sale or lease of the prewritten program. <u>Tax applies to any charge for consultation services provided in connection with a maintenance contract except as provided below.</u></p> <p>If the purchase of the maintenance contract is optional with the purchaser, <u>that is, if the purchaser may purchase the prewritten software without also purchasing the maintenance contract, and there is a single lump sum charge for the maintenance contract, 50 percent of the lump sum charge for the maintenance contract is for the sale of tangible personal property and tax applies to that amount; the remaining 50 percent of the lump sum charge is nontaxable charges for repair.</u> <u>If, however, no tangible personal property whatsoever is transferred to the customer during the period of the maintenance contract, tax does not apply to any portion of the charge.</u></p> <p><u>Tax does not apply to a separately stated charge for consultation services if the purchaser is not required to purchase those services in order to purchase or lease any tangible personal property, such as a prewritten computer program or a maintenance contract.</u></p> <p>If the purchase of the maintenance contract is optional with the purchaser, but the purchaser does not have the option to purchase the consultation services in addition to the sale or lease of storage media containing program improvements or error corrections, then the charges for the consultation services are taxable as part of the sale or lease of the storage media. If, however, the purchaser may, at its option, contract for the consultation services for a separately stated price, in addition to the charges made for the storage media, then the charges for the separately stated consultation services are nontaxable.</p> <p>(D) The sale or lease of a prewritten program is not a taxable transaction if the program is transferred by remote telecommunications from the seller's place of business, to or through the purchaser's computer, and the purchaser does not obtain possession of any tangible personal property, such as storage media, in the transaction. Likewise, the sale of a prewritten program is not a taxable transaction if the program is installed by the seller on the customer's computer except when the seller transfers title to or possession of storage media or installation of the program is a part of the sale of the computer.</p> <p>If the transfer of a prewritten program is a nontaxable transaction, then the seller is the consumer of tangible personal</p>

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	<p>property used to produce written documentation or manuals (including documentation or manuals in machine-readable form) designed to facilitate the use of the program and transferred to the purchaser for no additional charge. If a separate charge is made for the documentation or manuals, then tax applies to the separate charge.</p> <p>(E) The transfer of a prewritten program on storage media is not a sale for resale when the storage media, or an exact copy, will be used to produce additional copies of the program.</p> <p>Charges for testing a prewritten program on the purchaser's computer to insure that such a program operates as required are installation charges and are nontaxable.</p> <p>(2) CUSTOM PROGRAMS</p> <p>(A) Tax does not apply to the sale or lease of a custom computer program, other than a basic operational program, regardless of the form in which the program is transferred. Nor does the tax apply to the transfer of a custom program, or custom programming services performed, in connection with the sale or lease of computer equipment, whether or not the charges for the custom program or programming are separately stated.</p> <p>(B) However, charges for custom modifications to prewritten programs are nontaxable only if the charges for the modifications are separately stated. Otherwise, the charges are taxable as services part of the sale of the prewritten program.</p> <p>When the charges for modification of a prewritten program are not separately stated, tax applies to the entire charge made to the customer for the modified program unless the modification is so significant that the new program qualifies as a custom program. If the prewritten program was previously marketed, the new program will qualify as a custom program, if the price of the prewritten program was 50% <u>percent</u> or less of the price of the new program. If the prewritten program was not previously marketed, the new program will qualify as a custom program; if the charge made to the customer for custom programming services, as evidenced in the records of the seller, was <u>is</u> more than 50% <u>percent</u> of the contract price to the customer.</p> <p>(C) Any Charges for any written documentation or manuals designed to facilitate the use of a custom computer program by the customer are nontaxable, whether <u>separately stated</u> or not a separate charge is made for the documentation or manuals. The vendor of the custom computer program is the consumer of the written documentation or manuals, or of any tangible personal property used by the vendor in producing the written documentation or manuals.</p>

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	<p>(D) A custom computer program includes a program prepared to the special order of a customer who will use the program to produce and sell or lease copies of the program, <u>and the charge for such custom computer program is not subject to tax.</u> The Sales or leases of the copies, however, are taxable as sales of prewritten computer programs. The later sale or lease of such copies does not affect the non-taxability of the original custom computer program.</p> <p>(E) A computer program prepared to the special order of a customer to operate for the first time in connection with a particular basic operating system is a custom computer program even though a different version currently operates in connection with an incompatible basic operating system.</p> <p>(F) The transfer by the seller of original information created by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output to film, plate, or direct to press is not subject to tax when transferred by computer disk or other electronic storage media and the original information is a custom computer program. Such a process, currently termed "electronic or digital pre-press instruction," creates a new program which shall be considered a custom computer program as defined under Revenue and Taxation Code section 6010.9 of the Sales and Use Tax Law and is not subject to tax if the electronic or digital pre-press instruction is prepared to the special order of the customer. The electronic or digital pre-press instruction shall not, however, be regarded as a custom computer program if it is a "canned" or prewritten computer program which is held or existing for general or repeated sale or lease, even if the electronic or digital pre-press instruction was initially developed on a custom basis or for in-house use. Digital pre-press instruction is a custom computer program under section 6010.9 of the Revenue and Taxation Code, the sale of which is not subject to tax, provided the digital pre-press instruction is prepared to the special order of the purchaser. Digital pre-press instruction shall not, however, be regarded as a custom computer program if it is a "canned" or prewritten computer program which is held or existing for general or repeated sale or lease, even if the digital pre-press instruction was initially developed on a custom basis or for in-house use. The sale of such canned or prewritten digital pre-press instruction in tangible form is a sale of tangible personal property, the retail sale of which is subject to tax.</p> <p>(g) SERVICE CHARGES. The following activities are service activities. Charges for the performance of such services are nontaxable unless the services are performed as a part of the sale of tangible personal property.</p> <p>(1) Designing and implementing computer systems- (e.g., determining equipment and personnel required and how they will be utilized-).</p> <p>(2) Designing storage and data retrieval systems- (e.g., determining what data communications and high-speed input-output terminals are required-).</p>

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	<p>(3) Consulting services- (e.g., study of all or part of a data processing system-).</p> <p>(4) Feasibility studies- (e.g., studies to determine what benefits would be derived if procedures were automated-).</p> <p>(5) Evaluation of bids- (e.g., studies to determine which manufacturer's proposal for computer equipment would be most beneficial-).</p> <p>(6) Providing technical help, analysts, and programmers, usually on an hourly basis.</p> <p>(7) Training Services.</p> <p>(8) Maintenance of equipment. (See Regulation 1546 for application of tax to maintenance contracts.)</p> <p>(9) Consultation as to use of equipment.</p> <p>(h) PICK-UP AND DELIVERY CHARGES. If the data processing firm's billing is for nontaxable processing of customer-furnished information, the tax will not apply to pick-up and delivery charges. If pick-up and delivery charges are made in conjunction with the sale of tangible personal property or the processing of customer-furnished tangible personal property, the tax will apply to the pick-up charges. Tax will apply to the delivery charges to the extent specified in Regulation 1628, "Transportation Charges."</p> <p>(i) RENTAL OF COMPUTERS. A lease includes a contract by which a person secures for a consideration the use of a computer which is not on his <u>or her</u> premises, if the person or his <u>or her</u> employees, while on the premises where the computer is located operate the computer, or direct and control its operation. A lease does not include a contract whereby a person secures access by means of remote telecommunication, to a computer which is not on his <u>or her</u> premises, if the person or his <u>or her</u> employees operate the computer or direct and control its operation by means of remote telecommunication. (See Regulation 1660 for application of tax to leases.)</p>

Issue Paper Number 02-010



- Board Meeting
- Business Taxes Committee
- Customer Services and Administrative Efficiency Committee
- Legislative Committee
- Property Tax Committee
- Other

Optional Software Maintenance Agreements Regulation 1502, Computers, Programs and Data Processing

I. Issue

Should Regulation 1502, *Computers, Programs and Data Processing*, be amended to change the application of tax to optional software maintenance agreements?

II. Staff Recommendation

As agreed upon by staff and industry representatives, staff recommends that the Board authorize publication of the proposed amendments to Regulation 1502, as illustrated in Exhibit 2, including:

- Provide that 50 percent of the lump-sum charge for an optional software maintenance agreement is for the sale of tangible personal property and is subject to tax, and the remaining 50 percent of the lump-sum charge is a nontaxable charge for repair. (See Issue Paper (IP) page 3, and agenda action item 1.)
- Make nonsubstantive revisions throughout the regulation that reformat text and language consistent with current standards and delete references to obsolete computer processes. (See IP page 4, and agenda action item 1.)
- Conform the definition of digital pre-press instruction to the language used in Regulations 1540, *Advertising Agencies and Commercial Artists*, and 1541, *Printing and Related Arts*. (See IP page 4, and agenda action item 1.)

Staff recommends no operative date.

III. Other Alternatives Considered

Do not adopt proposed amendments to Regulation 1502, *Computers, Programs and Data Processing*.

FORMAL ISSUE PAPERIssue Paper Number 02-010**IV. Background**

Regulation 1502, *Computers, Programs, and Data Processing*, was adopted in 1972 to clarify the application of the sales and use tax to transactions involving computers, programs and data processing. The regulation was subsequently amended in 1987, 1998, and 1999. Provisions regarding the application of tax to charges for optional software maintenance agreements sold in connection with the sale or lease of prewritten computer programs were added to the regulation in subdivision (f)(1)(C) as part of the 1987 amendments. Currently, subdivision (f)(1)(C) provides that:

Maintenance contracts sold in connection with the sale or lease of prewritten computer programs generally provide that the purchaser will be entitled to receive, during the contract period, storage media on which prewritten program improvements or error corrections have been recorded. The maintenance contract also may provide that the purchaser will be entitled to receive, during the contract period, telephone or on-site consultation services.

If the purchase of the maintenance contract is not optional with the purchaser, then the charges for the maintenance contract are taxable, including charges for consultation services, as part of the sale or lease of the prewritten program.

If the purchase of the maintenance contract is optional with the purchaser, but the purchaser does not have the option to purchase the consultation services in addition to the sale or lease of storage media containing program improvements or error corrections, then the charges for the consultation services are taxable as part of the sale or lease of the storage media. If, however, the purchaser may, at its option, contract for the consultation services for a separately stated price, in addition to the charges made for the storage media, then the charges for the consultation services are nontaxable. Charges for program improvements or corrections to prewritten software provided solely by electronic means are not subject to tax.

The application of tax to charges for optional maintenance contracts involving the repair of tangible personal property in general is covered in subdivision (b) of Regulation 1546, *Installing, Repairing, Reconditioning in General*. It provides that if the repair work is performed under an optional lump-sum maintenance contract providing for the furnishing of parts, materials, and labor necessary to maintain the property, the repairer is regarded as the consumer of the parts and materials furnished.

At the first interested parties meeting held on January 31, 2002, interested parties expressed their view that optional software maintenance contracts were predominantly service contracts with incidental transfer of tangible personal property. Accordingly, interested parties believe optional software maintenance agreements are similar to optional maintenance contracts pursuant to Regulation 1546, *Installing, Repairing, Reconditioning in General*, and their sale should not be subject to tax. Staff expressed their view that customers receive improvements and upgrades to their software and that, when tangible personal property is transferred to the customer, the true

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object of an optional software maintenance agreement is the transfer of the tangible media on which software program codes or partial codes are recorded.

In an effort to better understand the nature and cycle of software maintenance agreements, staff reviewed various articles and studies regarding software maintenance. At the second interested parties meeting held on March 21, 2002, staff shared the findings of its research with interested parties, including the components of software maintenance and the approximate cost ratio that each component bears over the life of the software, on an industry-wide basis. Staff's research material and findings are illustrated in Exhibit 3.

Following the meeting, staff worked with industry to resolve differences regarding the taxable components of a lump-sum charge for an optional maintenance agreement and to reach a reasonable ratio for reporting the tax due.

This topic is scheduled for discussion at the May 29, 2002 Business Taxes Committee meeting.

V. Staff Recommendation

A. Description of the Staff Recommendation

As illustrated in Exhibit 2, staff's recommendations are:

1. Amend subdivision (f)(1)(C) of Regulation 1502 to provide that 50 percent of the lump-sum charge for an optional software maintenance agreement represents a taxable sale of tangible personal property and the remaining 50 percent of the lump-sum charge is nontaxable. Staff believes that optional software maintenance agreements include taxable sales of tangible personal property in the form of improvements and enhancements on disk or CD-ROM, as well as repair services. Based on industry studies and discussions with interested parties, it has become clear that a classification of software updates and program codes into specific taxable and nontaxable categories on a transaction-by-transaction basis is difficult and impractical. Board auditors are authorized to examine all records necessary to determine the correct tax liability under the Sales and Use Tax Law. However, they do not have computer programming expertise and are not in a position to compare software codes previously transferred to customers against new code that is provided pursuant to an update. Generally, an optional software maintenance agreement is renewed yearly or every few years over the life of the software. Based on available information, staff believes a 50:50 nonrebuttable ratio takes into account all taxable and nontaxable activities over the life of the software. While industry-related studies, as illustrated in Exhibit 3, indicate that a lower percentage has been attributed to "corrective maintenance," staff believes the 50:50 nonrebuttable ratio represents a reasonable and fair average over the life of the software. This ratio is also administratively efficient and benefits both retailers and the Board.

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2. Adopt nonsubstantive revisions throughout the regulation. The paragraphs in subdivision (b) were numbered to conform the subdivision to standard regulatory format; and the definitions of “Keystroke...Verifying,” “Off Line” and “On Line” were deleted as obsolete. The term “subdivision” was inserted before subdivision references throughout the regulation for clarification. Various phrases were deleted and replaced with clarifying language in subdivisions (f)(2)(B), (C), and (D). Gender appropriate language was added in subdivision (i).
3. Adopt revisions in subdivisions (b)(6) and (f)(2) to conform the definition and discussion of digital pre-press instruction to the regulatory language previously adopted by the Board in Regulations 1540, *Advertising Agencies and Commercial Artists*, and 1541, *Printing and Related Arts*.

B. Pros of the Staff Recommendation

- Recognizes a nontaxable portion of lump-sum sales of optional software maintenance agreements.
- Keeps reporting of tax and recordkeeping requirements simple for lump-sum sales of optional software maintenance agreements by providing a standard ratio for reporting the tax due.
- Provides conformity between Regulations 1502, 1540, and 1541 in regard to digital pre-press instruction.
- Provides consistency in formatting of the regulation.
- Updates the regulation by deleting obsolete terminology and adding clarifying language.

C. Cons of the Staff Recommendation

- Creates a potential for refunds since the effect of this regulatory amendment is retroactive.
- Changes current and historical staff and Board interpretation of application of tax as reflected in Regulation 1502(f)(1)(C).

D. Statutory or Regulatory Change

No statutory change is required. However, staff’s recommendation does require an amendment to Regulation 1502.

E. Administrative Impact

Staff will be required to notify taxpayers of the amendments to the regulation through an article in the Tax Information Bulletin, and to update and distribute the amended regulation.

FORMAL ISSUE PAPERIssue Paper Number 02-010**F. Fiscal Impact****1. Cost Impact**

No additional cost. As stated above, it is anticipated that taxpayers would be notified of the amendments to the regulation through an article in one of the scheduled Tax Information Bulletins (TIBs). The costs associated with the distribution of TIBs, which are routinely prepared and distributed to taxpayers, are accommodated within the Board's existing budget.

2. Revenue Impact

The revenue loss is estimated to be between \$17.5 million and \$28.3 million annually. See Revenue Estimate (Exhibit 1).

G. Taxpayer/Customer Impact

- Staff expects that this amendment will maintain ease of compliance since it provides taxpayers with a standard ratio to report the tax due.
- Taxpayers will be able to charge less tax, reducing total cost to end consumers.

H. Critical Time Frames

The proposed amendment represents an interpretation of existing statutes and, therefore, has no operative date. Implementation will take place 30 days following approval of the regulation by the State Office of Administrative Law.

VI. Alternative 1**A. Description Alternative 1**

Make no changes to Regulation 1502.

B. Pros of Alternative 1

- No regulatory change is required.
- No revenue loss is expected.
- There is no change to current and historical staff and Board interpretation of Regulation 1502(f)(1)(C).

C. Cons of Alternative 1

- Does not account for nontaxable activities.

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- Does not conform to Regulations 1540 and 1541 in regard to digital pre-press instruction.
- Does not provide consistency in formatting of the regulation.
- Retains obsolete terminology in the regulation.

D. Statutory or Regulatory Change

None.

E. Administrative Impact

None.

F. Fiscal Impact

1. Cost Impact

None.

2. Revenue Impact

None. See Revenue Estimate (Exhibit 1).

G. Taxpayer/Customer Impact

None.

H. Critical Time Frames

None.

Prepared by: Program Planning Division, Sales and Use Tax Department

Current as of: May 14, 2002



OPTIONAL SOFTWARE MAINTENANCE AGREEMENTS REGULATION 1502 – COMPUTERS, PROGRAMS AND DATA PROCESSING

Recommendation and Alternatives

Staff Recommendation:

As agreed upon by staff and industry representatives, staff recommends that the Board authorize publication of the proposed amendments to Regulation 1502, as illustrated in Exhibit 2 of the issue paper, including:

- Provide that 50 percent of the lump-sum charge for an optional software maintenance agreement is for the sale of tangible personal property and is subject to tax, and the remaining 50 percent of the lump-sum charge is a nontaxable charge for repair. (See Issue Paper (IP) page 3, and agenda action item 1.)
- Make nonsubstantive revisions throughout the regulation that reformat text and language consistent with current standards and delete references to obsolete computer processes. (See IP page 3, and agenda action item 1.)
- Conform the definition of digital pre-press instruction to the language used in Regulations 1540, *Advertising Agencies and Commercial Artists*, and 1541, *Printing and Related Arts*. (See IP page 3, and agenda action item 1.)

Staff recommends no operative date.

Alternative 1:

Do not adopt proposed amendments to Regulation 1502, *Computers, Programs and Data Processing*.

Background, Methodology, and Assumptions

Staff Recommendation:

The staff recommendation would provide that 50 percent of the lump-sum charge for an optional software maintenance agreement is for the sale of tangible personal property and subject to tax. Under the current provisions of Regulation 1502, the entire lump-sum charge for an optional software maintenance agreement is subject to tax.

The US Census Bureau in its publication *2000 Service Annual Survey* reports that total sales of software upgrades and maintenance agreements amount to \$9.4 billion nationwide. If we assume that California accounts for 12% of these sales, then California sales amount to \$1.1 billion.

The proposed amendments to Regulation 1502 would provide that 50% of the lump-sum charges for these sales would be considered nontaxable charges for repair. The total nontaxable amount would be \$550 million. The sales and use tax revenue on this amount at the effective California sales and use rate of 7.92% would be \$43.6 million.

Not all of this is currently subject to tax. For those optional software maintenance agreements that do have a lump-sum charge, but allow the customer to purchase the consultation services for a separate price, the charge for the consultation services is currently nontaxable. For those agreements that specify that all upgrades, etc. will be delivered to the purchaser electronically and that no transfer of tangible personal property will take place, the entire charge is not subject to tax.

Unfortunately, we have been unable to find any information regarding the portion of optional software maintenance agreements represented by either of the above conditions. In addition, industry representatives have indicated that they do not have any information regarding these amounts.

As an indication of the possible portion of the \$550 million that would be represented by the above situations, let us assume that 10% of this amount represents maintenance agreements that allow the purchase of separately priced consultation services. Discussions with industry representatives indicate that the industry practice is not to separately price these consultation services. Let us further assume that 25% of the \$550 million represents maintenance agreements that specify electronic transfers. With these assumptions, the nontaxable amount would be \$357.5 million ($\$550 \text{ million} \times (1 - .10 - .25) = \357.5 million) and the revenue on this amount would be \$28.3 million.

As an alternate estimate, let us assume that 10% of the agreements allow for separately price consultation services and that 50% of the agreements specify electronic transfers. Under these assumptions the nontaxable amount would be \$220.0 million ($\$550 \text{ million} \times (1 - .10 - .50) = \220.0 million) and the revenue on this amount would be \$17.5 million.

It would appear to be reasonable that the actual revenue loss would fall somewhere between these two estimates.

Alternative 1:

Alternative 1 has no revenue effect.

Revenue Summary

Staff Recommendation:

The revenue impact from providing that 50 percent of the lump-sum charge for an optional software maintenance agreement is for the sale of tangible personal property and is subject to tax, and the remaining 50 percent of the lump-sum charge is a nontaxable charge for repair would be within the following range:

	<u>Revenue Effect</u>	
State loss (5%)	\$11.0 million	\$17.9 million
Local loss (2.25%)	5.0 million	8.0 million
District loss (0.67%)	1.5 million	2.4 million
Total	\$17.5 million	\$28.3 million

Alternative 1:

Alternative 1 has no revenue effect.

Preparation

This revenue estimate was prepared by David E. Hayes, Research and Statistics Section, Agency Planning and Research Division. This revenue estimate was reviewed by Ms. Margaret Shedd, Legislative Counsel and Ms. Charlotte Paliani, Program Planning Manager, Sales and Use Tax Department. For additional information, please contact Mr. Hayes at (916) 445-0840.

Current as of April 30, 2002

Regulation 1502. Computers, Programs, and Data Processing.

Reference: Sections 995.2, 6006, 6007, 6010, 6010.9, 6011, 6012, 6015, and 6016, Revenue and Taxation Code.

(a) IN GENERAL. “Automatic data processing services” are those rendered in performing all or part of a series of data processing operations through an interacting assembly of procedures, processes, methods, personnel, and computers.

Automatic data processing services may be provided by manufacturers of computers, data processing centers, systems designers, consultants, software companies, etc. In addition, there are banks and other businesses which own or lease computers and use them primarily for their own purposes but occasionally provide services to others. Businesses rendering automatic data processing services will be referred to herein as “data processing firms.”

(b) DEFINITIONS OF TERMS.

~~Additional copies..... See (d)(5)(F).~~

~~(1) Application~~**APPLICATION.** ~~.....The specific job performance by an automatic data processing installation is referred to as an application. For example, data processing for a payroll may be referred to as a payroll application.~~

~~(2) Coding~~**CODING.** ~~.....The list, in computer code, of the successive computer instructions representing successive computer operations for solving a specific problem.~~

~~(3) Computer~~**COMPUTER.** ~~.....A computer is an electronic device (including word processing equipment and testing equipment) or combination of components, which is programmable and which includes a processor (central processing unit or microprocessor), internal memory, and input and output connections. Manufacturing equipment which incorporates a computer is a computer for purposes of this regulation. However, the term does not include manufacturing equipment which operates under the control of mechanical or electronic accessories, the attachment of the equipment of which is required for the machine to operate. An electronic device otherwise qualifying as a computer remains a computer even though it may be used for information processing, data acquisition, process control, or for the control of manufacturing machinery or equipment.~~

~~(4) Custom computer..... program and programming~~**CUSTOM COMPUTER PROGRAM AND PROGRAMMING.** ~~—A computer program prepared to the special order of the customer. A program prepared to the special order of the customer qualifies as a custom program even though it may incorporate preexisting routines, utilities, or similar program components. It includes those services represented by separately stated charges for modifications to an existing prewritten program which are prepared to the special order of the customer.~~

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(5) ~~Data Entry~~..... ~~(including Encoding)~~DATA ENTRY (INCLUDING ENCODING).
Recording information in or on storage media by punching holes or inserting magnetic bits to represent letters, digits, and special characters.

~~Electronic or Digital Pre-Press Instruction. Within the printing industry, the transfer by computer disk or other electronic storage media of original information created by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output to film, plate, or direct to press.~~

(6) DIGITAL PRE-PRESS INSTRUCTION. The creation of original information in electronic form by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output, within the printing industry, to film, plate, or direct to press, which is then transferred on electronic media such as tape or compact disc.

(7) ~~Input~~INPUT.The information or data transferred, or to be transferred, from storage media into the internal storage of the computer.

~~Keystroke..... Verifying. Use of a machine known as a punched card verifier or tape transcriber, which has a keyboard, to ensure that information punched in or transcribed on storage media during the keypunching operation has been entered properly. The machine signals when the punched hole and the depressed key disagree, or when the data on storage media differs from depressed keys.~~

~~Off Line..... Descriptive of a system and the devices in a system in which the operation of equipment is not under the control of a computer.~~

~~On Line..... Descriptive of a system and the devices in a system in which the operation of such equipment is under control of a computer.~~

(8) ~~Output~~OUTPUT.The information transferred from the internal storage of the computer to storage media or tabulated listing.

(9) ~~Prewritten Program~~PREWRITTEN PROGRAM.A program held or existing for general or repeated sale or lease. The term also includes a program developed for in-house use which is subsequently offered for sale or lease as a product.

~~Processing of Customer Furnished Information. See (d)(5).~~

(10) ~~Program~~PROGRAM.The complete plan for the solution of a problem, i.e., the complete sequence of automatic data processing equipment instructions necessary to solve a problem; includes both systems and application programs and subdivisions such as assemblers, compilers, routines, generators, and utility programs.

(11) ~~Proof Listing~~PROOF LISTING.A tabulated listing of input.

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~~(12) Source Documents~~ SOURCE DOCUMENTS. A document supplied by a customer of a data processing firm from which basic data are extracted (e.g., sales invoice).

~~(13) Storage media~~ STORAGE MEDIA. Includes hard disks, floppy disks, diskettes, magnetic tape, cards, paper tape, drums, and other devices upon which information is recorded.

(c) BASIC APPLICATIONS OF TAX.

(1) The transfer of title, for a consideration, of tangible personal property, including property on which or into which information has been recorded or incorporated, is a sale subject to tax.

(2) Charges for producing, fabricating, processing, printing, imprinting, or otherwise physically altering, modifying or treating consumer-furnished tangible personal property (cards, tapes, disks, etc.), including charges for recording or otherwise incorporating information on or into such tangible personal property, are generally subject to tax.

(3) A transfer for a consideration of the title or possession of tangible personal property which has been produced, fabricated, or printed to the special order of the customer, including property on which or into which information has been recorded or incorporated, is generally a sale subject to tax. However, if the contract is for the service of researching and developing original information for a customer, tax does not apply to the charges for the service. The tangible personal property used to transmit the original information is merely incidental to the service.

(4) Charges for the transfer of computer-generated output are subject to tax where the true object of the contract is the output and not the services rendered in producing the output. Examples include artwork, graphics, and designs. However, the transfer by the seller of the original information created by electronic or digital pre-press instruction is not subject to tax if the original information is a custom computer program as explained in subdivision (f)(2)(F).

(5) Charges for processing customer-furnished information (sales data, payroll data, etc.) are generally not subject to tax. (For explanation and specific application of tax, see subdivision (d) below.)

(6) Leases of tangible personal property may be subject to tax under certain conditions. (See Regulation 1660 for application of tax to leases.)

(7) Charges made for the use of a computer, on a time-sharing basis, where access to the computer is by means of remote telecommunication are not subject to tax. (See subdivision (i) below.)

(8) Generally data processing firms are consumers of all tangible personal property, including cards and forms, which they use in providing ~~exempt~~ nontaxable services unless a separate charge is made to customers for the materials, in which case tax applies to the charge made for the materials.

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(d) MANIPULATION OF CUSTOMER-FURNISHED INFORMATION AS SALE OR SERVICE.

(1) GENERAL. Generally tax applies to the conversion of customer-furnished data from one physical form of recordation to another physical form of recordation. However, if the contract is for the service of developing original information from customer-furnished data, tax does not apply to the charges for the service. The tangible personal property used to transmit the original information is merely incidental to the service.

(2) DATA ENTRY AND VERIFICATION. This ~~section~~ covers situations where a data processing firm's agreement provides only for data entry, data verification, and proof listing of data, or any combination of these operations. It does not include contracts under which these services are performed as steps in processing of customer-furnished information as discussed under subdivision (d)(5).

Agreements providing solely for data entry and verification, or data entry, providing a proof list and/or verifying of data are regarded as contracts for the fabrication of storage media and sales of proof lists. Charges therefor are taxable, whether the storage media are furnished by the customer or by the data processing firm.

Tax also applies to charges for the imprinting of characters on a document to be used as the input medium in an optical character recognition system. The tax application is the same regardless of which type of storage media is used in the operation.

(3) ADDRESSING (INCLUDING LABELS) FOR MAILING. Where the data processing firm addresses, through the use of its computer or otherwise, material to be mailed, with names and addresses furnished by the customer or maintained by the data processing firm for the customer, tax does not apply to the charge for addressing. Similarly, where the data processing firm prepares, through the use of its computer or otherwise, labels to be affixed to material to be mailed, with names and addresses furnished by the customer or maintained by the data processing firm for the customer, tax does not apply to the charge for producing the labels, ~~regardless of whether or not~~ the data processing firm itself affixes the labels to the material to be mailed. (For the Sale of mailing list by the proprietor of such list, as a sale of tangible personal property or as an ~~exempt nontaxable~~ addressing, see Regulation 1504 "Mailing Services.")

(4) MICROFILMING AND PHOTORECORDING. Tax applies to charges for microfilming or photorecording except, as provided in ~~paragraph~~ subdivision (d)(5), where the microfilming or photorecording is done under a contract for the processing of customer-furnished information. Tax applies to a contract where data on magnetic tape are converted into combinations of alphanumeric printing, curve plotting and/or line drawings, and put on microfilm or photorecording paper.

(5) PROCESSING OF CUSTOMER-FURNISHED INFORMATION.

(A) "Processing of customer-furnished information" means the developing of original information from data furnished by the customer. Examples of automatic data processing

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processes which result in original information are summarizing, computing, extracting, sorting, and sequencing. Such processes also include the updating of a continuous file of information maintained by the customer with the data processing firm.

(B) "Processing of customer-furnished information" does not include: (1) an agreement providing solely for the reformatting of data or for the preparation of a proof listing or the performance of an edit routine or other pre-processing, (2) the using of a computer as a mere printing instrument, as in the preparation of personalized computer-printed letters, (3) the mere converting of data from one medium to another, (4) an agreement under which a person undertakes to prepare artwork, drawings, illustrations, or other graphic material unless the provisions of subdivision (f)(2)(F) apply regarding digital or electronic pre-press instruction and custom computer programs. Additionally, graphic material furnished incidentally to the performance of a service is not subject to tax. For example, graphics furnished in connection with the performance of architectural, engineering, accounting, or similar professional services are not subject to tax. With respect to typography, clip art, combined with text on the same page is considered composed type as explained in Regulation 1541.

(C) Contracts for the processing of customer-furnished information usually provide that the data processing firm will receive the customer's source documents, record data on storage media, make necessary corrections, process the information, and then record and transfer the output to the customer.

Where a data processing firm enters into a contract for the processing of customer-furnished information, the transfer of the original information to the customer is considered to be the ~~rendition~~rendering of a service. Except as described in subdivisions (c)(8) above and (d)(5)(E) below, tax does not apply to the charges made under contracts providing for the transfer of the original information whether the original information is transferred on storage media, microfilm, microfiche, photorecording paper, input media for an optical character recognition system, punched cards, preprinted forms, or tabulated listing. The breakdown of the total charge into separate charges for each operation involved in processing the customer-furnished information will not change the application of tax.

(D) The furnishing of computer programs and data by the customer for processing under direction and control of the data processing firm will not alter the application of tax, notwithstanding that charges are based on computer time.

(E) Taxable Items. Where a data processing firm has entered into a contract which is regarded as a service contract under ~~paragraph subdivision (d)(5)(C) above~~ and the data processing firm, pursuant to the contract, transfers to its customer tangible property other than property containing the original information, such as: duplicate copies of storage media; inventory control cards for use by the customer; membership cards for distribution by the customer; labels (other than address labels); microfiche duplicates; or similar items for use, tax applies to the charges made for such items. If no separate charge is made, tax applies to that portion of the charge made by the data processing firm which the cost of the additional computer time (if any), cost of materials, and labor cost to produce the items bear to the total job cost.

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(F) Additional Copies. When additional copies of records, reports, tabulation, etc., are provided, tax applies to the charges made for the additional copies. "Additional copies" are all copies (other than carbon copies), whether the copies are prepared by rerunning the same program, by using multiple simultaneous printers, by looping a program such that the program is run continuously, by using different programs to produce the same output product, or by other means. Where additional copies are prepared the tax will be measured by the charge made by the data processing firm to the customer. If no separate charge is made for the additional copies, tax applies to that portion of the gross receipts which the cost of the additional computer time (if any), the cost of materials and labor cost to produce the additional copies bear to the total job cost. Charges for copies produced by means of photocopying, multi-lithing, or by other means are subject to tax.

(e) TRAINING SERVICES AND MATERIALS. Data processing firms provide a number of training services, such as data entry and verification, programming, and specialized training in systems design.

(1) Charges for training services are nontaxable, except as provided in subdivision (g) below where the training services are provided as part of the sale of tangible personal property. The data processing firm is the consumer of tangible personal property which is used in training others, or provided to trainees without a separate charge as a part of the training services.

(2) Tax applies to charges for training materials, including books, furnished to trainees for a charge separate from the charge for training services.

(3) Where a person sells tangible personal property, such as computers or programs, and provides training materials to the customer without making an additional charge for the training materials, this is a sale of the training materials. The selling price of the training materials is considered to be included in the sales price of the tangible personal property.

(f) COMPUTER PROGRAMS.

(1) **PREWRITTEN (CANNED) PROGRAMS.** Prewritten programs may be transferred to the customer in the form of storage media or by listing the program instructions on coding sheets. In some cases they are usable as written; however, in other cases it is necessary that the program be modified, adapted, and tested to meet the customer's particular needs. Tax applies to the sale or lease of the storage media or coding sheets on which or into which such prewritten (canned) programs have been recorded, coded, or punched.

(A) Tax applies whether title to the storage media on which the program is recorded, coded, or punched passes to the customer, or the program is recorded, coded, or punched on storage media furnished by the customer. The temporary transfer of possession of a program, for a consideration, for the purpose of direct use or to be recorded or punched by the customer, or by the lessor on the customer's premises, is a lease of tangible personal property. The tax applies unless the property is leased in substantially the same form as acquired by the lessor and the lessor has paid sales tax reimbursement or use tax with respect to the property.

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(B) Tax applies to the entire amount charged to the customer. Where the consideration consists of license fees, all license fees, including site licensing and other end users fees, are includable in the measure of tax. Tax does not apply, however, to license fees or royalty payments that are made for the right to reproduce or copy a program to which a federal copyright attaches in order for the program to be published and distributed for a consideration to third parties, even if a tangible copy of the program is transferred concurrently with the granting of such right. Any storage media used to transmit the program is merely incidental.

(C) Maintenance contracts sold in connection with the sale or lease of prewritten computer programs generally provide that the purchaser will be entitled to receive, during the contract period, storage media on which prewritten program improvements or error corrections have been recorded. The maintenance contract also may provide that the purchaser will be entitled to receive, during the contract period, telephone or on-site consultation services.

If the purchase of the maintenance contract is not optional with the purchaser, that is, if the purchaser must purchase the maintenance contract in order to purchase or lease a prewritten computer program, then the charges for the maintenance contract are taxable, including charges for consultation services, as part of the sale or lease of the prewritten program. Tax applies to any charge for consultation services provided in connection with a maintenance contract except as provided below.

If the purchase of the maintenance contract is optional with the purchaser, that is, if the purchaser may purchase the prewritten software without also purchasing the maintenance contract, and there is a single lump sum charge for the maintenance contract, 50 percent of the lump sum charge for the maintenance contract is for the sale of tangible personal property and tax applies to that amount; the remaining 50 percent of the lump sum charge is nontaxable charges for repair. If, however, no tangible personal property whatsoever is transferred to the customer during the period of the maintenance contract, tax does not apply to any portion of the charge.

Tax does not apply to a separately stated charge for consultation services if the purchaser is not required to purchase those services in order to purchase or lease any tangible personal property, such as a prewritten computer program or a maintenance contract.

~~If the purchase of the maintenance contract is optional with the purchaser, but the purchaser does not have the option to purchase the consultation services in addition to the sale or lease of storage media containing program improvements or error corrections, then the charges for the consultation services are taxable as part of the sale or lease of the storage media. If, however, the purchaser may, at its option, contract for the consultation services for a separately stated price, in addition to the charges made for the storage media, then the charges for the separately stated consultation services are nontaxable.~~

(D) The sale or lease of a prewritten program is not a taxable transaction if the program is transferred by remote telecommunications from the seller's place of business, to or through the purchaser's computer, and the purchaser does not obtain possession of any tangible personal property, such as storage media, in the transaction. Likewise, the sale of a prewritten program is

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not a taxable transaction if the program is installed by the seller on the customer's computer except when the seller transfers title to or possession of storage media or installation of the program is a part of the sale of the computer.

If the transfer of a prewritten program is a nontaxable transaction, then the seller is the consumer of tangible personal property used to produce written documentation or manuals (including documentation or manuals in machine-readable form) designed to facilitate the use of the program and transferred to the purchaser for no additional charge. If a separate charge is made for the documentation or manuals, then tax applies to the separate charge.

(E) The transfer of a prewritten program on storage media is not a sale for resale when the storage media, or an exact copy, will be used to produce additional copies of the program.

Charges for testing a prewritten program on the purchaser's computer to insure that such a program operates as required are installation charges and are nontaxable.

(2) CUSTOM PROGRAMS

(A) Tax does not apply to the sale or lease of a custom computer program, other than a basic operational program, regardless of the form in which the program is transferred. Nor does the tax apply to the transfer of a custom program, or custom programming services performed, in connection with the sale or lease of computer equipment, whether or not the charges for the custom program or programming are separately stated.

(B) However, charges for custom modifications to prewritten programs are nontaxable only if the charges for the modifications are separately stated. Otherwise, the charges are taxable as services part of the sale of the prewritten program.

When the charges for modification of a prewritten program are not separately stated, tax applies to the entire charge made to the customer for the modified program unless the modification is so significant that the new program qualifies as a custom program. If the prewritten program was previously marketed, the new program will qualify as a custom program, if the price of the prewritten program was 50% percent or less of the price of the new program. If the prewritten program was not previously marketed, the new program will qualify as a custom program, if the charge made to the customer for custom programming services, as evidenced in the records of the seller, ~~was~~ is more than 50% percent of the contract price to the customer.

(C) ~~Any Charges for any~~ written documentation or manuals designed to facilitate the use of a custom computer program by the customer are nontaxable, whether separately stated or ~~not a separate charge is made for the documentation or manuals~~. The vendor of the custom computer program is the consumer of the written documentation or manuals, or of any tangible personal property used by the vendor in producing the written documentation or manuals.

(D) A custom computer program includes a program prepared to the special order of a customer who will use the program to produce and sell or lease copies of the program, and the charge for such custom computer program is not subject to tax. ~~The Sales or leases of the~~

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copies, however, are taxable as sales of prewritten computer programs. ~~The later sale or lease of such copies does not affect the non-taxability of the original custom computer program.~~

(E) A computer program prepared to the special order of a customer to operate for the first time in connection with a particular basic operating system is a custom computer program even though a different version currently operates in connection with an incompatible basic operating system.

~~(F) The transfer by the seller of original information created by combining more than one computer program into specific instructions or information necessary to prepare and link files for electronic transmission for output to film, plate, or direct to press is not subject to tax when transferred by computer disk or other electronic storage media and the original information is a custom computer program. Such a process, currently termed "electronic or digital pre press instruction," creates a new program which shall be considered a custom computer program as defined under Revenue and Taxation Code section 6010.9 of the Sales and Use Tax Law and is not subject to tax if the electronic or digital pre press instruction is prepared to the special order of the customer. The electronic or digital pre press instruction shall not, however, be regarded as a custom computer program if it is a "canned" or prewritten computer program which is held or existing for general or repeated sale or lease, even if the electronic or digital pre press instruction was initially developed on a custom basis or for in-house use. Digital pre-press instruction is a custom computer program under section 6010.9 of the Revenue and Taxation Code, the sale of which is not subject to tax, provided the digital pre-press instruction is prepared to the special order of the purchaser. Digital pre-press instruction shall not, however, be regarded as a custom computer program if it is a "canned" or prewritten computer program which is held or existing for general or repeated sale or lease, even if the digital pre-press instruction was initially developed on a custom basis or for in-house use. The sale of such canned or prewritten digital pre-press instruction in tangible form is a sale of tangible personal property, the retail sale of which is subject to tax.~~

(g) **SERVICE CHARGES.** The following activities are service activities. Charges for the performance of such services are nontaxable unless the services are performed as a part of the sale of tangible personal property.

(1) Designing and implementing computer systems: (e.g., determining equipment and personnel required and how they will be utilized.)

(2) Designing storage and data retrieval systems: (e.g., determining what data communications and high-speed input-output terminals are required.)

(3) Consulting services: (e.g., study of all or part of a data processing system.)

(4) Feasibility studies: (e.g., studies to determine what benefits would be derived if procedures were automated.)

(5) Evaluation of bids: (e.g., studies to determine which manufacturer's proposal for computer equipment would be most beneficial.)

- (6) Providing technical help, analysts, and programmers, usually on an hourly basis.
- (7) Training Services.
- (8) Maintenance of equipment. (See Regulation 1546 for application of tax to maintenance contracts.)
- (9) Consultation as to use of equipment.

(h) PICK-UP AND DELIVERY CHARGES. If the data processing firm's billing is for nontaxable processing of customer-furnished information, the tax will not apply to pick-up and delivery charges. If pick-up and delivery charges are made in conjunction with the sale of tangible personal property or the processing of customer-furnished tangible personal property, the tax will apply to the pick-up charges. Tax will apply to the delivery charges to the extent specified in Regulation 1628, "Transportation Charges."

(i) RENTAL OF COMPUTERS. A lease includes a contract by which a person secures for a consideration the use of a computer which is not on his or her premises, if the person or his or her employees, while on the premises where the computer is located operate the computer, or direct and control its operation. A lease does not include a contract whereby a person secures access by means of remote telecommunication, to a computer which is not on his or her premises, if the person or his or her employees operate the computer or direct and control its operation by means of remote telecommunication. (See Regulation 1660 for application of tax to leases.)

Optional Software Maintenance Agreements Research Findings

Following is a summary of the findings of staff's research regarding software maintenance agreements. We were particularly interested in the components of such agreements and the ratio of each component to the total agreement. The Institute of Electrical and Electronics Engineers (IEEE) generally defines software maintenance as the process of modifying a software system or component after delivery to correct faults, improve performance or other attributes, or adapt to a changed environment. Generally, software maintenance is divided into the following three categories:

Corrective maintenance identifies and corrects software failures, performance failures, and implementation failures. It refers to changes due to actual errors in a system.

Adaptive maintenance accounts for changing environments in hardware and software. It is performed to adapt software to changes in the data requirements or processing environments. It includes any effort which is initiated as a result of changes in the environment in which a software system must operate.

Perfective maintenance meets changing requirements and provides improvements. It is performed to enhance performance, improve maintainability or improve executing efficiency. It includes all changes, insertions, deletions, modifications, and enhancements which are made to a system to meet the evolving or expanding needs of users.

With respect to the amount of maintenance performed in each category, the following table provides the approximate percentages of all software maintenance efforts and costs based on our review of available material. The following pages contain a reference list of all of the literature that was reviewed.

Ref.	Date and Source	Corrective	Adaptive	Perfective
1	Post 2000 per references cited in study. <i>Operating Systems Support for Software Maintenance: An Assessment Using WWW Server Software.</i>			>50%
2	Post September 1999 reference cited in study. <i>Software Maintenance and Evolution: A Roadmap.</i> K.H. Bennett and V.T. Rajlich	about 21%		around 75%
3	1990 – IEEE. <i>Software Maintenance Management.</i> D. Longstreet.	20%	20%	60%
4	1987. IEEE Transactions on Software Engineering. <i>The State of Software Maintenance.</i> Survey of 487 data processing organizations.	20%	25%	55%
5	1985. <i>Executive Guide to Software Maintenance.</i> NBS Special Publication 500-130, W. Osborne.	20%	20%	60%
6	1984. <i>Software Maintenance and Modifiability.</i> 1981 <i>Maintenance is a Management Problem and a Programmers Opportunity.</i>	8%	35%	57%
	1984 – AEA survey of software industry for AB 3459 purposes. ¹ Includes technical support, error corrections, and newsletters/bulletins.	75% ¹		25%
	1984 San Jose District analysis of four cases.	Range 28%-67% Average 41% ¹		Range 33%-72% Average 59%

Optional Software Maintenance Agreements
Research Findings

LIST OF LITERATURE REVIEWED

Software Risk Management – Not just for the Big Manufacturer

Medical Device and Diagnostic Industry Magazine, June 1997

J. Suzuk and d. Kesolak

How Software Evolves: an Exploratory Analysis of Software Change Histories
(Research-in-progress - 1996) S. Slaughter CMU and W. Sim CMU

On a life cycle basis, more than 3/4ths of the investment in software occurs after the software has been implemented (Arthur L.J., Software Evolution New York: John Wiley, 1988)

...Data indicate that software modules that have received corrective maintenance once are highly likely to be repaired repeatedly over their entire lifetimes. Only a small percent (about 10-20% of the modules in the system) received corrective work, those modules are continually repaired.

1998 Trends in Software Licensing and Legal Protection for Software

F. Greguras (Fenwick & West LLP)

Discussion of transaction being a license vs. sale and other licensing issues

Software Engineering and UCITA

C. Kaner, J.D, Ph.D., Journal of Computer and Information Law, Vol. 18 #2, Winter 1999/2000

UCITA – Uniform Computer Information Transactions Act. Proposed amendment to UCC

Software Evolution: The Software Maintenance Challenge

L.J. Arthur, John Wiley & Sons Inc. 1988

Software Life Cycle: Requirements, Preliminary Design, Detailed Design, Implementation, Testing, Operational and Maintenance

Software Evolution Activities: Correcting Defects (maintenance), Enhancing Function (evolution), Improving Quality (maintenance).

Where correcting defects – fixing defects. Adaptive – all work related to changing how software functions, Perfective – all efforts to improve quality of software.

Maintenance Process: change request through acceptance & release.

Change Management: identify, describe, track

“80/20” Rule (Juran 1979) – 20% of the programs consume 80% of the budget and resources. Aka “vital few and trivial many”

Handbook of Software Maintenance

G. Parikh, Wiley-Interscience Publication John Wiley & Sons, 1986

Maintenance – Corrective (correct problems i.e. abends and system not meeting requirements), Adaptive (account for changing environments in hardware and software), Perfective (meet changing requirements and improvements) – (Swanson, 1976)

Optional Software Maintenance Agreements
Research Findings**Measuring & Motivating Maintenance Programmers**

J. Landsbaum and R. Glass, Prentice Hall (1992)

*Maintenance: Errors, New Requirements, Enhancements (Perry – 1983 – “Managing Systems Maintenance”)**J Martin and C McClure “Software Maintenance: The Problem and Its Solutions” (1983) – maintenance includes corrections, design enhancements and adjustments to program behavior, and that corrections consume only 20% of the maintenance work. The authors reduced that figure to 6%**GUIDE publication GPP-130 “Maintenance Productivity Improvements Through Matrices and Measurements (1985) Maintenance:*

Category	Percent
Repair	8
Enhancement	54
Conversion	2
User support	11
Prevention	3
Nonproject	22

Software Maintenance and Computers

D Longstreet, IEEE Computer Society Press (1990)

*“Reports on Computer Science and Technology” NBS Special Publication 500-130 (Oct 1985) #12 What is the cost of software maintenance: Software maintenance represents 60-70% of the total cost of software.... Prefective maintenance (changes, enhancements, extensions, etc.) comprise approximately 60%... of the costs. Adaptive maintenance and corrective maintenance are each approximately 20% of the total.***Ref. 4***“The State of Software Maintenance”, N Schneidewind (IEEE Transactions on Software Engineering, Vol. SE-13, #3 Mar 1987) Survey by B.P. Lientz and B.E. Swenson “Problems in Application Software Maintenance”: In a survey of 487 data processing organizations, ... most maintenance is perfective (55%): performed to enhance performance, improve maintainability, or improve executing efficiency. This is followed by adaptive maintenance (25%): performed to adapt software to changes in the data requirements or processing environments. Lastly there is corrective maintenance (20%): performed to identify and correct software failures, performance failures, and implementation failures. [B.P. Lientz and E.B. Swanson, Software Maintenance Management. Addison-Wesley (1980)]***Ref. 3***“Software Maintenance Management”, D. Longstreet, [IEEE – 1990] Categories of Software Maintenance: Adaptive (includes all modifications made to meet the changing structure.... accounts for 20% of all software maintenance conducted during the operation phase. Corrective (are changes necessitated by actual errors)... account for 20% of all software maintenance conducted during the operation phase. Perfective (are the changes and modifications that take place because of changes or expanding needs of the user) ... accounts for 60% of all software maintenance conducted during the operation phase**“Managing Application Program Maintenance Expenditures” T. Guimaraes [Communications of the ACM Oct 1983 Vol. 26, #10] Table 1: Estimations of Percentage of Total Costs Represented by Maintenance Costs. Note: table lists a number of studies and the percent of total cost of maintenance.***Ref. 6***“Maintenance as a function of design” J. McKee (Proceedings of the 1984 National Computer Conference, Vol. 53, 1984) J. Reuter, “Maintenance is a Management Problem and a Programmers Opportunity” [AFIPS, Proceedings of the National Computer Conference Vol. 50, 1981] Distribution of Maintenance Costs – Errors: 8%, Environment Changes: 35%, Upgrades and enhancements 57%,**“Software Maintenance and Modifiability” D. Frost, [Proceedings of the 1985 Phoenix Conference on Computers and Communications] ... essential difference exists between hardware and software maintenance:[M. b. Klien “Software and Hardware R&M: What are the Differences” [Proceedings, 1980. Reliability and Maintainability Symposium] For hardware, the basic assumption is that the design is correct, and that operational errors result from physical causes. ... For software the analogous basic assumption is that an error during operation results from a program bug rather than from the program wearing out.*

Optional Software Maintenance Agreements
Research Findings

Ref. 5

“Executive Guide to Software Maintenance”

NBS Special Publication 500-130, W. Osborne (1985)

Types of maintenance: perfective, adaptive, and corrective. Software Maintenance represents 60-70% of total cost of software. Perfective maintenance (changes, enhancements, extensions, etc.) comprises approximately 60% of software maintenance costs. Adaptive and corrective maintenance are each approximately 20% of the total.

“A Literature Review on the Quantification of Software Change (1996)

A.L. Powell, Department of Computer Science University of York

Discussion on software development and change. Measurement, maintenance, estimation, and process improvement.

“An Assessment and Comparison of Common Software Cost Estimation Modeling Techniques” (1999)

L. C. Briand, Khaled El Emam, Dagmar Surmann, Isabella Wieczorek [International Conference on Software Engineering

Assess and compare a selection of common cost modeling techniques....

“Vendors Dream Up Ways to Extract More Revenue”

Kaikumar Vijayan (July 16, 2001) Computerworld

The goal is to ensure a predictable, long term revenue stream from existing customers via subscriptions, services and add on fees to make up for sluggish revenue growth from new licenses.

Microsoft Alters License, Upgrade Plans

Carol Sliwa (May 14, 2001) Computerworld

“Maintenance Dollars at Work, Software vendors have it right: Maintenance work can double as development”

Nina Lytton (July 16, 2001) ROI Computerworld

ISO 9000 an Introduction

ISO is International Organization for standardization, guidelines, and reports

Ref. 1

“Operating Systems Support for Software Maintenance: An Assessment Using WWW Server Software”

Suranauwarat Hideo Taniguchi

The magnitude of software maintenance cost is estimated to comprise 50% of ... overall cost and a large portion of this cost, over 50% is spend on changes to accommodate changing user requirements.

“Implications of Evolution Metrics on Software Maintenance (1998)”

M.M. Lehman, D.E. Perry, J.F. Ramil

FEAST (Feedback, Evolution, And Software Technology) and FEAST/I project. Metrics of evolution. Software

“Understanding Software Productivity (Dec 1994)”

Walt Scacchi, Information and Operations Management Department, School of Business Administration USC

Discussion of software productivity measurement studies and terms them fundamentally inadequate and misleading

Optional Software Maintenance Agreements
Research Findings**“Measurements to Manage Software Maintenance”**

George E. Stark, the MITRE Corporation (1997)

*Maintenance consumes 60 to 80% of a typical product's total software lifecycle expenditures and over 50% of programmer effort is dedicated to it***Ref. 2****“Software Maintenance and Evolution: A Roadmap”**

K.H. Bennett and V.T. Rajlich

*Software maintenance defined: IEEE Standard 1219 and ISO/IEC. Survey shows: Around 75% of maintenance effort is on Adaptive and Perfective and error correction (Corrective) consumed about 21%. New user requirements is the core problem for software evolution and maintenance.(post September 1999 reference cited)***“A Characterization of the Software deployment Process and a Survey of related Technologies”**

Antonio Carzaniga (September 1997), Dipartimento di Elettronica e Informazione

*Characterization of the deployment process, framework for evaluation technologies intended to address deployment process. Definitions***“A Methodology for Validating Software Product Metrics”**

Khaled El Emam NRC-CNRC (National Research Council Canada Institute for Information Technology)

*Discussion of methodology for validating software product metrics (and an appendix on evaluating code churn)***“Total Software Process Model Evolution in EPOS”**Minh Nguyen, Alf Inge Wang, Reidar Conradi (May 1996) [4th ICSP, 9-11 December, 1996]*Case study of process model evolution***“Design Metrics as an Aid to Software Maintenance: An Empirical Study”**

Elaine Ferneley, Journal of Software Maintenance Research and Practice 11, 55-72 (1999)

*Proposed technique for identifying areas within system design prone to future corrective or preventative maintenance activity.***Determinants of Software Maintenance Profiles: An Empirical Investigation**

Chris Kemerer and Sandra Slaughter, Software Maintenance: Research and Practice, Vol. 9, 235-251 (1997)

*Characteristics of software modules are associated with predicable maintenance profiles. Such profiles can be used to predict and plan for maintenance.***An Examination of the Effects of Requirements Changes on software Maintenance Releases**

George Stark, Paul Oman, Alan Skillicorn, and Alan Ameen, Journal of Software Maintenance: Research and Practice, 11, 293-309 (1999)

*Requirements are foundation of software release process. Changing requirements impacts the maintenance costs. Inadequate approaches for dealing with changes. Exploratory data analysis to understand the sources, frequency and types of changes being made. Regression model to help manage cost and schedule effects of changing requirements.**Additions are the most common form of requirement change (average 48% of the projects)*

Optional Software Maintenance Agreements Research Findings

Software Maintenance from a Service Perspective

Frank Niessink, Hans van Vliet, Journal of Software Maintenance: Research and Practice, Vol. 12, Issue 2, 2000

Case studies of software maintenance and development as a service. Uses standard definitions (corrective, adaptive and perfective maintenance). Focus is on Service and Quality: Gap 1(differences between expectations between provider and customer), Gap 2 (differences between service providers perception and service specifications), Gap 3 (actual service delivery from specified services), Gap 4 (communication does not match actual service)

Types of Software Evolution and Software Maintenance

Ned Chapin, Joanne Hale, Khaled MD. Khan, Juan Ramil, and Wui-Gee Tan, Journal of Software Maintenance and Evolution: Research and Practice (2001: 13: 3-30)

Provides a classified list of maintenance activities and a condensed decision tree as a summary guide to the proposed evidence based classification of the type of software evolution and software maintenance.

A Decision Framework for Enterprise Resource Planning Maintenance and Upgrade: A Client Perspective

Celeste See Pui Ng, Journal of Software Maintenance and Evolution: Research and Practice (2001: 13: 431-468)

*Case study and empirical data analysis on ERP maintenance and upgrade characteristics. New version reduces number of ERP client done enhancements and potentially reduces future **Legal Change Patch** enhancements modifications (LCP). **Legal Change Patch maintenance** is almost as costly as user enhancements. Study found ERP maintenance costs on average 25% of initial ERP investment. ARM research states that an upgrade to ERP is a further 25-33% of initial investment.*

Characteristics of ERP Software Maintenance: a Multiple Case Study

Fiona Fui-Hoon Nah, Silvana Faja, Teuta Cata (Journal of Software Maintenance and Evolution: Research and Practice (Vol. 13, Issue 6, 2001, 399-414)[Dec 2001]

Multiple case study: identify maintenance activities pertinent to Enterprise Resource Planning (ERP) implementation, classify them into maintenance categories, assess relative frequency at various stages of the ERP maintenance lifecycle. Corrective, Adaptive, perfective, preventive, user support. New: communication with external parties – “external parties”. Highlights differences between maintenance of ERP and traditional systems.

Stages of Maintenance: Introduction, Growth, Maturity, Decline

New: User Support proposed by Abran & Nguyenkim – Analysis of maintenance work categories through measurement. [“Proceedings Conference on software Maintenance”. IEEE Computer Society Press 1991; 104-113]

Maintenance Tasks: Corrective, Adaptive, Perfective, Preventative, User Support, External Parties

Policy Analysis for Warranty, Maintenance, and Upgrade of Software Systems

Izzet Shain and Fatemeh Zahedi; Journal of Software Maintenance and evolution: Research and Practice (2001: 13: 469-493)

Post installation changes – largest cost component in lifecycle. Over half of staff time spent on maintenance. Maintenance is 67% of software costs. Maintenance is 60-70% of MIS budgets. Software maintenance is more than \$70 Billion. Bibliography missing – unable to support or understand context of estimates.

Optional Software Maintenance Agreements
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Understanding and Predicting the Process of Software Maintenance Releases

Victor Basili, Lionel Brian, et al; Technical Report, University of Maryland (Aug 1995) [appeared Proc of the 18th Int. Conf. on S/W Eng. March 1996]

Effort spent on enhancements varied from 51 to 89% among the dominant projects.

Two Case Studies in Measuring Software Maintenance Effort

Frank Niessink and Hans van Vliet; Faculty of Math and Computer Science [Pub: proceedings of the International Conference of Software Maintenance , Nov 1998]

Corrective maintenance tasks cost 4 to 5 times less effort than adaptive, perfective, or preventative tasks.