BY THE COMPTROLLER GENERAL

Report To The Chairman, Committee On Government Operations House of Representatives

OF THE UNITED STATES

Patent And Trademark Office Needs To Better Manage Automation Of Its Trademark Operations

At the request of the Committee Chairman, GAO reviewed automation efforts at the Department of Commerce's Patent and Trademark Office (PTO). GAO found that, in attempting to automate its trademark operations, PTO did not (1) thoroughly analyze user needs, (2) adequately assess the cost-effectiveness of its systems, (3) properly manage three exchange agreement contracts, and (4) fully test one of its systems before accepting it from the contractor.

PTO has addressed several of these problems, but it needs to do more. GAO makes recommendations to the Congress and to the Secretary of Commerce to assist PTO in correcting problems noted in this report.

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-217448

The Honorable Jack Brooks
Chairman, Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

This letter responds to your July 11, 1984, request that we conduct a review of the automation of the trademark operations at the Department of Commerce's Patent and Trademark Office (PTO). In 1980, the Congress required PTO to prepare a plan to identify its automation needs and, if necessary, develop an office-wide automation system. In 1981, in response to this mandate, PTO began planning automation of its trademark operations. Since then, it has spent over $9 million to develop and operate three automated systems. In February 1985, PTO estimated the trademark automation effort would cost $22.4 million in developmental and operational costs through 1988.[1]

On the basis of your request and later discussions with your office, we examined management issues relating to automation of PTO's trademark operations. Specifically, we focused on PTO's (1) analyses of system user requirements, (2) a 1982 trademark automation cost/benefit analysis, and (3) contracting practices and procedures for acquiring the automated trademark systems. We contacted PTO and industry officials, reviewed their files, and obtained affidavits from certain individuals about matters on which we had received conflicting information. This letter summarizes our findings and presents our conclusions and recommendations. Appendix I provides specific details on our review.

In its 1982 Automation Master Plan, PTO established three major goals for its trademark automation effort--improved registration quality, cost-effectiveness, and reduced application processing time.

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[1]Trademark automation costs are a part of PTO's office-wide automation program that PTO estimated in 1982 to cost at least $719.9 million through 2002. PTO's estimate did not separate trademark and patent automation costs. Also, PTO omitted significant trademark automation costs in its 1982 cost/benefit analysis. However, it did include estimated cost reductions that would result from the automation effort.

original trademark documents. PTO's automated monitoring and retrieval systems became operational in 1983 and early 1984, respectively.

PTO has experienced difficulty in using its search system. PTO accepted the search system from the contractor in June 1984 when it was not in a position to test all of the system's features. Furthermore, it has had to supplement the automated search system with manual searching because, according to the Assistant Commissioner for Trademarks, the data base contains too many errors for use without manual verification. As of April 1985, the system was not fully operational.

PTO has announced that it plans to eliminate its manual search facility after the automatic search system becomes fully operational and reliable. As of April 1985, PTO had not specified when this would occur.

In 1983, PTO entered exchange agreements with three companies to obtain computer tapes of trademark information (machine-readable data bases) to be used on its automated monitoring and search systems. In general, the companies agreed to type (key enter) data from PTO's trademark records onto computer tapes and provide these tapes to PTO for use in its automated trademark systems. In return, PTO agreed to (1) provide copies of trademark data tapes and related documents for the companies' own use and (2) place certain restrictions on public access to the trademark data base. Under the existing manual searching process, no restrictions exist.

With respect to the initial exchange agreement restrictions, the public would not be allowed to use the more advanced capabilities of PTO's planned automated search system to access the trademark data. For example, the public would not be able to search phonetically for trademarks that sound alike. The companies wanted restrictions on the automated system to ensure that PTO's search system did not compete with their trademark search business, according to PTO and company officials. Thus, at the time the agreements were entered, if PTO had terminated manual searching according to its announced intentions, the effect of the public access restriction might have been to force the public to do business with one of the exchange companies or forego the more effective trademark search techniques.

CERTAIN USER REQUIREMENTS WERE NOT IDENTIFIED

Federal ADP management regulations required that agencies prepare a comprehensive requirements analysis before they acquire ADP systems. At a minimum, the analysis must include critical factors, such as a study of data entry, handling, and output needs, and "the ADP functions that must be performed to meet the mission need."

While PTO performed analyses of user needs, we believe these analyses were inadequate because they did not specify all basic requirements for PTO's trademark systems. Such weaknesses often

PTO did not discount[2] the expected cost savings. Because of these insufficiencies, we believe the savings estimates are not reliable.

The current Trademark Office officials question the accuracy of the 1982 cost reduction estimates which, among other things, assume that automation will decrease Trademark Office annual operating costs by about one-third. Although the Administrator for Automation considers these estimated operating cost reductions achievable, the Assistant Commissioner for Trademarks and the Trademark Office staff stated that the one-third assumption is too high, leading to an exaggerated cost reduction estimate. The estimate's margin of error could be significant. If the 1982 analysis is recomputed using current cost data, an estimating methodology that properly incorporates discounting, and a more conservative estimate that there will be a 10 percent reduction in Trademark Office operating costs (according to Trademark Office officals, the highest achievable percentage)--the original estimated cost reduction becomes a cost increase. We could not determine the reasonableness of the assumptions of either group of officials because there was insufficient evidence offered to thoroughly support either set of assumptions.

PTO's Administrator for Automation said that he did not develop a more refined cost/benefit analysis because PTO's primary goal for trademark automation was to improve registration quality by using more comprehensive trademark searches on a more complete trademark file. He added that cost-effectiveness was not the primary automation goal. PTO's 1982 cost/benefit analysis, however, did not document support for the expectation of improved registration quality.

PROBLEMS EXPERIENCED WITH EXCHANGE AGREEMENTS

PTO's use of exchange agreements was specifically authorized by the Congress in Public Law 97-247 (approved on August 27, 1982). This authority allows PTO to use items or services of value rather than money to obtain needed goods or services. To date, PTO has not developed specific criteria for deciding when exchanges rather than monetary contracts should be used.

In 1983, PTO signed three exchange agreements with three different companies to acquire a data base of trademark information. PTO officials told us that the agreements were properly entered under PTO's exchange agreement authority, developed using appropriate procedures, and economical. We found, however, that

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[2]Discounting is a standard practice by which expected future cash flows are estimated and reduced to reflect the time value of money. The Administrator for Automation said that PTO did not discount the expected trademark cost savings it presented in the cost/benefit analysis section of its 1982 Automation Master Plan.

SEARCH SYSTEM ACCEPTED WITHOUT BEING FULLY TESTED

PTO's search system contract with the System Development Corporation stipulates that government acceptance of the system is "contingent upon the system passing all tests associated with the acceptance program." The image retrieval subsystem was an integral part of the search system.

We found that PTO excluded from the acceptance program any tests of the image retrieval subsystem because it knew that the necessary data base would not be available in time for the scheduled delivery of the subsystem. PTO made an agreement with the contractor to test the image retrieval subsystem at a later date. Nevertheless, PTO chose to officially accept the entire search system based on a partial test. Furthermore, PTO stated in a June 21, 1984, letter to the contractor that "tests were conducted in accordance with the specifications of the RFP [request for proposals] and all requirements were satisfied. Based on the results of the acceptance testing, the PTO accepts the Trademark Search System."

In a test in November 1984 to determine image retrieval capabilities, the system performed searches over 20 minutes, not 16 minutes as the contract required. Since the average search time specified in the contract, 16 minutes, was equal to the average manual search time, this test demonstrated that the system was slower than the old manual approach. In an April 1985 retest, the system achieved the 16-minute requirement. A PTO Trademark Office official told us that, during this third test, the system could not accommodate 10 simultaneous image searches; a PTO contracting official confirmed that the contract requires the system to accommodate at least 24 simultaneous design searches. Trademark Office officials corroborate the current inadequate search capability.

A PTO automation official acknowledged that the search system was accepted before all testing requirements were met. He characterized the problems as minor and ultimately correctable by the contractor. PTO's Assistant Commissioner for Finance and Planning said funds could be withheld should the contractor not meet contract requirements, such as average search timeliness. However, PTO's contracting official told us that PTO could not withhold funds to ensure performance. Regardless of which official is correct and whatever other recourse that may be available to PTO, these difficulties could have been avoided had PTO better managed its acceptance test program, particularly the test schedule associated with that program. In April 1985, PTO officials told us that they were planning to request further contractor corrections.

CONCLUSIONS

While it appears that PTO can accomplish the automation of certain of its trademark operations, the existing functional

Office officials, and (3) include support for the key assumptions.

--Review and, if necessary, revise PTO's systems specifications to ensure that all key requirements to support the systems' use by PTO personnel and by the public are met.

--Make all reasonable efforts to expeditiously and economically acquire unrestricted ownership of the trademark data bases obtained through the exchange agreements.

--Establish criteria for determining when future ADP resource exchange agreements should be used and develop procedures to ensure that these exchanges comply with applicable federal procurement regulations. Such criteria and procedures should also require that PTO thoroughly analyze the value of future agreements and fully assess their impacts on PTO and the public.

To ensure appropriate oversight, we recommend that the Secretary of Commerce review and approve PTO's response to the above recommendations to assure that they are properly implemented. Until the Secretary is satisfied that PTO has appropriately reanalyzed the costs and benefits of PTO's trademark automation and reviewed the systems specifications, the Secretary should also require that any significant procurement actions regarding trademark automation efforts, including new procurements as well as modifications to or renewals of existing procurements, undergo departmental review and approval. This should include exchange agreement procurements.

We also recommend that the Secretary direct PTO to maintain its manual trademark system until the capabilities of its automated systems are at least equal to the manual system.

MATTER FOR CONSIDERATION OF THE CONGRESS

If PTO does not take steps to implement the above recommendations regarding exchange agreements, the Congress should consider withdrawing PTO's exchange agreement authority for ADP resource acquisitions.

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We discussed key facts with agency program officials and made such changes as appropriate to reflect any relevant factual information they provided. However, we did not share our conclusions and recommendations with PTO's responsible officials or the contractors, nor did we request official agency or contractor comments on a draft of this report. As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report for 30 days from its date of issuance. We will then send copies to the Secretary of Commerce, the Acting

PROBLEMS EXPERIENCED IN AUTOMATING TRADEMARK OPERATIONS

In 1981, in response to a 1980 congressional mandate (Public Law 96-517) to prepare a plan to identify and, if necessary, develop office-wide automation, the Department of Commerce's Patent and Trademark Office (PTO) initiated a 20-year automation program. In its 1982 Automation Master Plan, PTO estimated that this program would cost about $720 million.[1] PTO plans to use automation to achieve paperless trademark and patent operations by 1990. The trademark automation effort, involving three automated systems and data base exchange agreements, is an important component of PTO's office-wide program. In February 1985, PTO estimated costs for trademark automation operation and development at about $22 million through 1988.[2]

This appendix details the results of our review of PTO's trademark automation efforts. In summary, we found that PTO did not (1) thoroughly analyze or develop the functional requirements for its or the public's use of its three automated systems; (2) adequately assess the costs and benefits of automation; (3) accurately value its three exchange agreements, effectively develop its first exchange, or achieve maximum practicable competition on its second and third exchanges; and (4) fully test its trademark search system before accepting it from a private contractor.

PTO'S TRADEMARK AUTOMATION EFFORTS

Trademarks--words or symbols that identify and distinguish products--are used to indicate the origin of goods and services.[3] Trademarks are registered with PTO primarily to help protect the owner's rights to the trademark.

Several PTO units are involved in PTO's trademark automation program. The Administrator for Automation and his staff (hereafter the Automation Office) manage the program. The Administrator reports to the Assistant Commissioner for Finance and Planning who

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[1]PTO's 1982 Automation Master Plan listed a high, 20-year cost estimate of $810.9 million and a low estimate of $719.9 million. The plan did not separate patent and trademark costs. PTO's Administrator for Automation told us that PTO could not separate trademark automation costs in the 1982 plan.

[2]According to PTO's Assistant Commissioner for Finance and Planning, trademark automation cost estimates range from about $16 million to $22.4 million, depending on the program composition.

[3]Service marks are used with services. Hereafter, for simplicity, both types of marks will be referred to as trademarks.

This automated search system, which PTO acquired through a contract that provides for eight yearly renewals with the System Development Corporation, is estimated to cost about $10 million. PTO reported that it spent about $2.2 million on this search system through fiscal year 1984, the first year of the contract. The trademark application monitoring system was internally developed and was designed to monitor the status of trademark applications. PTO reported that this system cost about $2 million through 1984. PTO's computer-assisted retrieval system, which was designed to microfilm, retrieve, and print copies of PTO's original trademark documents, reportedly cost about $200,000 through 1984.

PTO's monitoring and retrieval systems became operational in April 1983 and February 1984, respectively. PTO accepted its search system from the contractor in June 1984. PTO has announced that it plans to eliminate the manual search facility after the automated search system becomes fully operational. As of April 12, 1985, PTO had not specified when this would occur.

In 1983, PTO signed three non-monetary (barter-type) exchange agreements with three private companies to obtain computer tapes of trademark information in a machine-readable form. On April 12, 1984, one exchange company acquired another and their agreements were consolidated into a new agreement with PTO in June 1984, leaving only two exchange agreements. These non-monetary agreements were for the exchange of items and services between PTO and the companies. PTO has authority to enter exchange agreements for items or services pursuant to Public Law 97-247 (August 27, 1982). These three contracts, with reported PTO costs of about $500,000 through 1984, were initially valued at about $3 million. Computer tapes obtained through these exchanges are used on PTO's searching and monitoring systems. PTO's remaining trademark automation costs of about $4 million cover such items as system engineering support and staffing.

In general, in return for the companies' typing PTO's data onto computer tapes (key-entering), PTO provided the companies with copies of registered trademark and application documents (from which trademark data tapes were developed) and agreed to provide future trademark tapes and to restrict the public's access to the trademark data. This is in contrast to the existing manual searching process which has no such restrictions.

With respect to the initial exchange agreement restrictions, the public would not have been allowed to use the more advanced capabilities of PTO's planned automated search system to access the trademark data. For example, in conformance with exchange agreement restrictions, the search system contract did not allow the public to search phonetically for trademarks that sound alike. The companies wanted restrictions on the automated system to ensure that PTO's search system did not compete with their trademark search business, according to PTO and company officials. Thus, at the time the agreements were reached, if PTO had terminated manual

to determine whether the search system was meeting or was expected to meet their needs.

We discussed key facts with agency program officials and made such changes as appropriate to reflect any relevant factual information they provided. However, we did not share our conclusions and recommendations with PTO's responsible officials or the contractors, nor did we request official agency or contractor comments on a draft of this report. Except for these steps, our work was performed in accordance with generally accepted government auditing standards.

CERTAIN USER REQUIREMENTS WERE NOT IDENTIFIED

Federal Property Management Regulation Subchapter F, Part 101-35, required that before agencies acquire an ADP system, they must prepare a comprehensive requirements analysis to include, at a minimum, such critical factors as a study of data entry, handling, output needs, and "the ADP functions that must be performed to meet the mission need." We found that PTO did not develop detailed and complete requirements before acquiring its automated systems. While PTO subsequently corrected some of these oversights, PTO's incomplete analyses led to the acquisition of systems that do not fully and effectively meet user needs.

PTO did not adequately specify the requirements for its $10 million automated search system and, as a result, omitted important automated search features. For example, several PTO officials stated that they forgot to include a requirement for a basic searching technique in the December 1983 contract with the System Development Corporation. Industry and Trademark Office officials characterized this search technique as fundamental to trademark searching. PTO learned of the omission during system acceptance testing in May 1984 and subsequently modified the contract to include this requirement at an estimated cost of $70,255.

Similarly, PTO did not fully analyze or adequately specify searching requirements for public searchers prior to contract award, even though it allocated about one-third of the search system's terminals for public use. PTO announced in 1983 that the public's access to its automated search system would be "comparable and equivalent" to manual methods available at PTO's public search room. (In the December 1983 search system contract, PTO stated that the public would receive comparable and equivalent access, and PTO subsequently broadened and further specified what it meant by such access; however, this had not been incorporated in the contract.) In June 1984, after an outcry from the trademark industry regarding PTO's plan to restrict public access, PTO decided to offer the public full search system access, including the advanced search techniques that were desired by the public but were not previously planned for the public.

In July 1984, PTO issued internal guidelines specifying what it meant by "comparable and equivalent" and, in August 1984, issued

While PTO performed analyses of user requirements, we believe these analyses were inadequate because they did not ensure that all basic requirements were specified for its trademark systems. Such weaknesses often result, as they did in PTO, in agencies' acquiring systems that do not fully respond to their needs. The previously mentioned comments from the Administrator for Automation regarding why PTO proceeded as it did, indicate that trademark automation was rushed so that PTO could obtain anticipated benefits of automation as quickly as possible. Nevertheless, PTO's incomplete analyses have resulted in systems that do not fully meet its needs.

AUTOMATION COSTS AND BENEFITS NOT ADEQUATELY ASSESSED

Federal Property Management Regulation Subchapter F, Part 101-35 required that agencies justify automation activities with a comprehensive requirements analysis, including consideration of "the cost/benefits that will accrue as a result of this performance." PTO's 1982 cost/benefit analysis indicated that automating the trademark operations would reduce its operating costs by about $77 million over a 20-year period. However, PTO did not include significant cost estimates of acquiring and operating its automated trademark system in computing the $77 million cost-reduction estimate. Also, according to the Administrator for Automation, PTO's analysis did not separate trademark and patent automation costs because the cost portion of the study was done on a PTO-wide basis and PTO's analysis of trademark automation did not reduce the total savings by expected trademark systems' acquisition and operating costs. While PTO prepared a cost/benefit analysis of trademark automation in 1982, this analysis was inadequate because it was based on assumptions that lacked analytical support and was not discounted. Because of these insufficiencies, we believe the savings estimates are not reliable. Other claimed automation benefits, such as increased registration quality and reduced application processing time, also were not supported by thorough analysis.

PTO's Automation Office and Trademark Office officials disagree on the extent, if any, of cost savings expected from the automation of trademark operations. PTO's Administrator for Automation told us that PTO's initial assumptions about life-cycle cost savings are still appropriate. However, PTO Trademark Office officials, including the Assistant Commissioner for Trademarks, contend that PTO's 1982 estimates, which were expected to start occurring in 1985, are based on questionable assumptions and are substantially overstated. PTO used several assumptions in its 1982 automation analysis to estimate that about one-third of the trademark budget could be saved annually through automation. For example, the Administrator for Automation explained that the 1982 analysis was based on the assumption that PTO would save money by eliminating a recurring trademark publication printing contract. However, the Assistant Commissioner for Trademarks and the Trademark Office staff disagree with this assumption. They explained that although PTO planned to eliminate this contract, any savings would be offset by the need for additional clerical support and additional editing

automation was to improve registration quality by using more comprehensive trademark searches on a more complete trademark file. He added that cost-effectiveness was not the primary goal.

PTO's anticipated benefits of improved registration quality and reduced application processing time also have not been supported by thorough PTO analysis. PTO planned to improve registration quality through improved file integrity by ensuring that its loosely bound paper search files were more accurate and complete in an automated data base form. While PTO officials have commented about lost and misfiled trademarks, PTO did not quantify the extent of its trademark paper-search, file-integrity problem and thus had little basis of comparison to determine whether automation would, in fact, improve data integrity and thus, registration quality. In this regard, PTO recently reported that 60 percent of the records in the automated data base contain at least one error. On March 12, 1985, PTO estimated that it would cost $655,832 to fully verify and correct these errors. The Assistant Commissioner for Trademarks stated that data base errors have prevented PTO's use of the automated system without manual search verification. The Assistant Commissioner for Trademarks stated that the data base contains too many errors for use without using manual verification. As of April 1985, the system still was not fully operational.

In addition, in its 1982 automation study, PTO planned to reduce a 19-month registration process by about 14 weeks through automation. Trademark Office officials told us, however, that instead of a 14-week savings, a maximum 2-week reduction in application time may be achieved through automation. PTO's Administrator for Automation stated that this particular estimate is based on time saved through (1) the use of machine-readable application forms and (2) a change to in-house printing of PTO's weekly publication of registered trademarks. However, the Assistant Commissioner for Trademarks and Trademark Office officials have stated that such accomplishments are not likely in the foreseeable future, if ever, and that the greatest time savings (a maximum of 2 weeks) would likely occur in the printing area. The Administrator for Automation stated that PTO has not conducted a pilot test to determine the potential savings of machine-readable trademark applications and has no specific plans to do so.

We believe the costs and benefits have not been adequately assessed. We recognize that predicting automation impacts is difficult. Nevertheless, the range of estimates between PTO's 1982 automation study and the views of PTO's Trademark Office officials, along with the lack of documented analytical bases for the estimates, indicate that PTO should recompute the estimates and support them with documented, analytical evidence.

future trademark image data.[9] Image data is a digital representation of the trademark itself; coding specifies the type of image. In return for these services[10] (valued by PTO and the companies at about $3 million), the companies received from PTO (1) copies of registered trademarks and application documents (from which exchange tapes were developed), (2) an agreement to provide future trademark data tapes with unlimited restrictions on their use, and (3) assurance that it would restrict the public's access to the trademark data base.[11] This value was based primarily on PTO's estimate of the cost of creating the data base by means of a monetary key-entry procurement and PTO's judgments on other items, such as the value of office space PTO was to provide. The exchange agreements also included provisions that fixed PTO's future data-tape sales prices. In addition, according to Automation Office officials, the agreements provide that each party will use its "best efforts" to carry out its responsibility under the agreements. The Administrator for Automation told us that this provision means that compliance with these contracts is based upon a "gentleman's agreement."

Originally, the agreements PTO signed with the three companies restricted public access to the resulting trademark computerized data. Even though PTO planned to obtain a more advanced search capability, PTO agreed to restrict public access to methods "comparable and equivalent" to those provided through PTO's manual search facility. In June 1984, after an outcry from the trademark industry over this arrangement, PTO decided to allow unrestricted public access to its search system for a fee. Part of the charge would be a royalty fee to be paid to the companies. In December 1984, after receiving additional public complaints about these arrangements, PTO announced its intention to procure the trademark data by sole-source procurements with Compu-Mark and Thomson which would, according to PTO officials, effectively "buy out" at least some of the restrictive exchange agreement provisions. As of April 12, 1985, these procurements were being negotiated, and the scope, terms, and impacts of the buy out had not yet been resolved.

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[9]On April 12, 1984, Thomsom acquired Computer Research. As a result, a new agreement, reached in June 1984, essentially consolidated the previous two agreements, leaving only two exchange partners, Thomson and Compu-Mark.

[10]Company and PTO officials explained that the trademark expertise of the exchange partners enhanced the source data entry services provided.

[11]Because the agreements include several ambiguous provisions and because PTO could not find complete copies of its original agreements, we supplemented our analysis of these documents with explanations from PTO and company officials.

General Services Administration with central authority for the acquisition and management of ADP equipment. The act has been interpreted to cover not only equipment but also related ADP resources, including ADP support services. The Federal Procurement Regulation requires that government procurements be made on a competitive basis to the maximum extent practical.[13] In this regard, PTO reported to the Congress in its December 1982 Automation Master Plan that "all acquisition actions will conform to federal procurement regulations to achieve maximum practical competition...."

PTO did not follow procurement procedures required by the Brooks Act and the Federal Procurement Regulation because it did not and does not consider the exchanges to be procurements. Consequently, none of the exchange agreements were developed with these procurement regulations in mind. Nevertheless, we reviewed PTO's actions to determine whether they substantially conformed to the regulatory requirements for the procurement of commercial ADP support services. Under requirements of the Federal Procurement Regulation, before procuring commercial ADP support services, a federal agency must determine whether these services are available within the government or under General Services Administration contractual arrangements. If the services are not available, the agency may procure such services without the approval of the General Services Administration. The regulation also requires that maximum practicable competition among offerors who can meet an agency's ADP needs must be obtained to ensure that those needs are satisfied at the lowest overall cost, considering price and other factors. When only one contractor can meet an agency's needs, the agency is required to document the basis and justification for sole-source selection.

We concentrated on the requirement for maximum practicable competition because it is of central importance in assuring that the government's needs are satisfied at the lowest overall cost.[14] Regarding the first exchange, we could not conclude that PTO obtained maximum practicable competition because of the conflicting information we received. However, we found that PTO's approach to the first exchange may not have been the most effective way to assure that the government obtained the best bargain.

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[13]41 Code of Federal Regulations Sections 1-1.301-2 and 1-4.1206.

[14]Although the evidence did not establish whether PTO sought or could have obtained ADP support services through other federal agencies or under then-existing General Services Administration contracts, nothing in the nature of exchange agreements is inherently inconsistent with acquiring ADP support services in any of these ways.

addition to Compu-Mark) attempted to arrange exchange agreements from January 1983 to May 1983, after learning about the Compu-Mark agreement. No agreements comparable to the Compu-Mark exchange were reached although two of the companies--Thomson and Computer Research--subsequently entered into exchange agreements covering other kinds of data.

Regarding the Commerce Business Daily announcement, a representative of Datatrust provided the following sworn statement about 1983 negotiations with PTO.

> "[The PTO negotiating official] stated that PTO had an agreement with Compu-Mark for trademark text capture (key entry) and that PTO was seeking complementary proposals. [The PTO official] actively directed the discussion to consideration for a Datatrust proposal to code, classify, and capture trademark designs or images. I believe that the purpose and effect of his directing the discussion to this area was to restrict Datatrust to coding, classifying, and capturing trademark designs or images."

PTO officials explained that the only reason they may have needed a second company to duplicate the Compu-Mark agreement was to help validate the integrity of Compu-Mark produced data.

Datatrust officials told us that they also had discussed an image proposal with PTO but, in effect, were rejected in May 1983 when PTO announced that Thomson would be automating the image portion of the trademark data base.

Because Datatrust officials stated that their options for exchanges were effectively restricted, we contacted Thomson and Computer Research to determine how negotiations proceeded in early 1983. Officials from both companies stated that when they contacted PTO after the Compu-Mark agreement, PTO officials indicated that PTO had the text backfile agreement and that the companies should propose something else. In a sworn statement, the Computer Research official said that, "PTO effectively restricted the part of the trademark data base for which we could compete." He added that his firm was effectively limited to the future text data area, even though it was also interested in an image data base project. He explained that PTO's representative "indicated that PTO was interested in giving all interested parties a different 'piece of the pie'."

In response to company officials' comments, PTO's Administrator for Automation also provided a sworn statement. He stated that:

> "Before discussing or negotiating proposals further, I was explicit in verbally asking an official representing each company if they had seen the announcement - if they were interested in obtaining an identical CM [Compu-Mark]

four companies for the image and future trademark application tasks."[16]

--The announcements of the Computer Research and Thomson agreements in the May 20, 1983, Commerce Business Daily did not invite proposals from other interested firms for materials and services which were the same as or equivalent to these two agreements. Rather, the announcements requested proposals only for exchanges of materials and services.[17] These requests were consistent with PTO's policy regarding exchange agreements, which was published in the Federal Register on May 5, 1983. Under this policy PTO will consider a proposal for a particular kind of exchange and is not required to solicit competitive proposals. PTO's policy states that:

> "Due to resource limitations and the necessity for diversity in the program, only one offer will normally be accepted for a given PTO incentive. If substantially similar offers are received within any 45-day period, they will be evaluated and/or negotiated together. The offer which provides the best total consideration for the Government will be accepted."

Consequently, we believe that PTO did not obtain maximum practical competition on the second and third exchanges. Because PTO did not publicly announce requests for proposals and had limited contacts with companies regarding its proposals before it entered the Computer Research and Thomson agreements, PTO was unable to ensure that it would receive enough offers from firms that could meet its needs at the lowest overall cost, price and other factors considered. PTO also was not prepared to enter into other arrangements that were competitive with the Computer Research and Thomson agreements. Both its invitation for proposals in the Commerce Business Daily announcements of these agreements and its exchange agreement policy did not contemplate that there would be other agreements for the type of data bases Computer Research and Thomson would furnish.[18]

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[16]PTO officials stated that they had other contacts with companies for ADP resources during January 1983 through May 1983 but added that PTO did not specifically discuss future text or image proposals.

[17]The May 20, 1983, Commerce Business Daily notice stated, "The PTO welcomes proposals from other suppliers for the exchange of materials and services."

[18]We found no documentation which established the basis and justification for PTO's sole-source selection of Computer Research and Thomson as required by 41. C.F.R.S. 1-4.1206-5.

advanced capabilities of the PTO search system. Subsequently, the planned charges for unrestricted public access using a specific number of PTO terminals were publicly announced for comment. The charges consisted of a $40 per hour base fee for comparable and equivalent access and a $30 royalty fee for the companies because the companies allowed access using the more advanced capabilities. This proposed fee has not yet been finalized. To develop its access fee, PTO briefly analyzed the two key components of the fee--public search volume and PTO's trademark search costs. PTO used a 1-week survey of the public search room to estimate volume of usage and included in the search costs its overhead costs and some trademark search system costs, which may not be directly attributable to the public's access.

Other agreement provisions also resulted in significant current and possible future impacts on the public's access to PTO trademark data. These provisions require that PTO not sell, and exert its best efforts to prevent others from obtaining in a computer-readable form, the trademark application data, the historic trademark text data, and all image data obtained from the companies through the exchanges. The provisions also prevented electronic dial-up access from outside PTO, except from its affiliated Patent Depository Libraries located around the country.

In addition, PTO agreed to fix the price for a year of its "Official Gazette Trademarks" computer tapes to a figure that was seven times its previous price. Prior to the agreements, PTO had been making certain tapes available to the public through the Department of Commerce at a price of $6,150. Now, under the agreements, PTO must sell this data for a price that PTO officials describe as an estimated fair market value of $43,200.[19] Furthermore, only Compu-Mark and Thomson can sell the tapes for less. According to PTO officials, the $43,200 price effectively recovers PTO's total estimated costs of data entry. Thus, PTO can recover its total estimated key-entry costs in one sale. In addition, the Assistant Commissioner for Finance and Planning told us that PTO would recover all costs and make a profit on the first sale. One prospective purchaser was placed in the unenviable position of seeking this data from a competitor, Compu-Mark, after PTO quoted him the new price. According to the prospective purchaser, PTO suggested that he contact Compu-Mark if he wanted to obtain the data at a lower price.

Currently, PTO is negotiating to pay to have at least some of the restrictions in the agreements removed. If PTO had developed its data base under contract for a monetary fee, it would have retained sole control over the use and dissemination of its data.

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[19]A PTO official explained that purchasers paying the $43,200 price for the 1984 tape would also receive prior years' tapes and that subsequent tapes would cost $43,200 per year.

Finally, PTO could not locate for us a complete copy of two of its three original exchange agreements. Through more thorough, careful planning and management, these problems could have been avoided.

SEARCH SYSTEM ACCEPTED WITHOUT BEING FULLY TESTED

PTO's search system contract with the System Development Corporation stipulates that government acceptance of the system is "contingent upon the system passing all tests associated with the acceptance program." The image retrieval subsystem was an integral part of the search system.

We found that PTO excluded from the acceptance program any tests of the image retrieval subsystem because it knew that the necessary data base would not be available in time for the schedule delivery of the subsystem. PTO made an agreement with the contractor to test the image retrieval subsystem at a later date. Nevertheless, PTO chose to officially accept the entire search system based on a partial test. Furthermore, PTO stated in a June 21, 1984, letter to the contractor that "tests were conducted in accordance with the specifications of the RFP [request for proposals] and all requirements were satisfied. Based on the results of the acceptance testing, the PTO accepts the Trademark Search System."

In its first test, PTO compared the system to its (1) general workstation requirements, (2) search requirements, and (3) timeliness requirements. However, PTO did not test the system with an image data base until November 1984, 5 months after it had already accepted the total system. During the November test, PTO learned that the system did not meet a mandatory search timeliness requirement. PTO retested the system for timeliness in April 1985 and found that it met this requirement; however, another requirement was found to be deficient. Nevertheless, PTO accepted the system in June 1984, without assurance that it would meet the contract specifications.

PTO divided its acceptance test into two sections--text retrieval and image retrieval--because required image data from an exchange agreement company was scheduled by PTO for delivery during June through August 1984, after the contractually scheduled system test in April 1984. Also, PTO accepted the system months before the image data was installed. The first test covering text retrieval began on May 16, 1984, and concluded when PTO accepted the total system on June 21, 1984. The second test for the image retrieval component began on November 28, 1984.

missing from the data base and no more than 40 of the 61 search terminals were simultaneously tested. During testing, several deficiencies were noted in the general workstation requirements test. For example, according to PTO's test team, the contractor did not provide easily understood, documented, "user friendly" instructions on system use--a problem that had been noted during the first test. In addition, according to the test team, while the required capability to search across a range of trademark classes worked, it was too slow for practical use.

The most disturbing result of the second test was the system's slow search time. The system averaged more than 20 minutes per search--over 4 minutes slower than the contractual requirement. Design mark searches were especially high, averaging over 27 minutes. The second test also documented that automated searching was slower than the manual approach since the 16-minute search time criterion was based on a PTO estimate of the average time required to perform manual searches.

As a result of the second test, PTO directed the contractor to correct the deficiencies noted. According to a PTO Trademark Office official, the contractor corrected the functional requirements by February 28, 1985. PTO retested the system for timeliness in April 1985 and reported that it met this requirement. However, this same PTO official also told us that the system now would not accommodate 10 simultaneous image searches (a contract official concurred that the contract required that the system be able to accommodate a minimum of 24 simultaneous image searches), and that PTO was requesting further contractor corrections.

PTO's Assistant Commissioner for Finance and Planning stated that PTO could withhold funds if the contractor did not meet contract requirements, such as average search timeliness. However, a PTO contracting official told us that PTO could not withhold funds to ensure performance.

Regardless of which official is correct and whatever other recourse that may be available to PTO, these difficulties could have been avoided had PTO better managed its acceptance test program, particularly the test schedule associated with that program.

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To accomplish this, PTO has acquired automatic data processing (ADP) services and equipment through monetary procurements; it is acquiring the associated data bases through non-monetary arrangements, known as exchange agreements, with firms that provide trademark related services. Under the exchange agreements, PTO agreed to provide the firms with trademark data for the firms' own use and accepted restrictions on public access to certain automated trademark information. In return, the firms agreed to produce and provide copies of PTO's trademark data bases in machine-readable form. PTO is moving forward with its automation effort. However, we found that, because of the manner in which this effort has been managed to date, PTO has little assurance of meeting its goals.

PTO has encountered four distinct types of management problems in its trademark automation activities. PTO did not (1) thoroughly analyze or develop the functional requirements for its or the public's use of its three automated systems, (2) adequately assess the costs and benefits of its automation systems, (3) properly manage its three exchange agreements, and (4) fully test its trademark search system before accepting it from the contractor.

PTO has addressed or is addressing several of the problems we noted. However, we believe its efforts to date are not enough to overcome all the problems.

AUTOMATING TRADEMARK OPERATIONS

Trademarks are words or symbols that identify and distinguish products and are used to indicate the origin of goods and services. Trademarks are registered with PTO primarily to help protect the owner's rights to the trademark.

PTO's Administrator for Automation and his staff (hereafter the Automation Office) manage the office-wide automation program and were responsible for developing the automation plan, including identifying requirements and developing PTO's cost/benefit analysis. PTO's primary users of the automated trademark systems are under the Office of the Assistant Commissioner for Trademarks (hereafter the Trademark Office). The public currently uses PTO's manual search files and those elements of the automated system that are fully operational. The public will have access to additional elements of the automated system as they become operational.

As part of its automation effort, PTO has automated three trademark operations involving information searching, monitoring, and retrieving. The search system is being developed by the System Development Corporation; PTO developed the other two systems. In general, these systems were intended to improve PTO's ability to (1) search existing trademarks to ensure that confusingly similar trademarks are not registered, (2) monitor the status of trademark applications, and (3) microfilm, retrieve and print copies of PTO's

result, as they did in PTO, in agencies' acquiring systems that do not fully and effectively meet user needs.

In developing its trademark application monitoring system, for example, PTO did not identify all essential features needed for its computer terminals used for data editing. As a result, PTO purchased terminals without the necessary editing features. These terminals were replaced by other terminals available to PTO. The replacement terminals were also deficient. According to Trademark Office officials, the limitations of the terminals have contributed to an unacceptably high data-entry error rate that necessitated a $327,214 proofreading contract to correct the errors. PTO also spent $137,000 for its computer-assisted retrieval system before learning that it could not provide the printout quality required by public users of the system. In addition, in planning its trademark search system, PTO omitted a basic search routine that industry and Trademark Office officials characterized as fundamental to trademark searching. Subsequently, PTO identified and corrected this problem through a contract modification costing about $70,000.

We also found indications that PTO recognized the incompleteness of its requirements analysis. PTO's Administrator for Automation, in a March 1984, internal memorandum, stated:

> "The lack of a consolidated, coherent functional requirement document...is a continuing handicap in Trademarks.... From a systems point of view, it would have been more efficient, over the long haul, to have deferred the development of the ATS [Automated Trademark System] system, including especially TRAM, [the monitoring system] until the long-range concepts was [sic] solidified. Of course, that would have delayed all aspects of Trademark automation and the consequent benefits from it. This was a major consideration in following the current course."

AUTOMATION COSTS AND BENEFITS NOT ADEQUATELY ASSESSED

Federal ADP management regulations also required that agencies justify automation activities with a comprehensive requirements analysis, including consideration of "the cost/benefits that will accrue...." PTO's 1982 cost/benefit analysis indicated that automating the trademark operations would reduce its operating costs by about $77 million over a 20-year period. However, PTO omitted significant cost estimates of acquiring and operating its automated trademark system in computing the $77 million cost reduction estimate. Also, according to the Administrator for Automation, PTO's analysis did not separate trademark and patent automation costs because the cost portion of the study was done on a PTO-wide basis. We also found that PTO's analysis was inadequate because it was based on assumptions that lacked analytical support and because

while PTO received benefits from the exchanges, (1) the benefits PTO received were less than those provided to the companies, (2) the approach PTO used to develop the exchange agreements was inappropriate, and (3) maximum practical competition on two agreements was not obtained. Lastly, PTO did not adequately consider all future impacts of the exchanges on itself or the public.

In negotiating the terms of the exchange agreement, PTO and the companies initially placed no value on a provision that PTO would limit public access to its data base. As a result, the companies received greater value than did PTO. Subsequently, PTO and the companies assigned an estimated present value of $3.18 million to this contract provision. This value was based on PTO's estimate of the costs of creating the data base primarily by means of a monetary key-entry procurement.

On March 13, 1985, we issued a legal opinion on PTO's exchanges. We concluded that the exchanges were procurements of commercial ADP support services subject to the requirements of the Brooks Act and the Federal Procurement Regulation. The General Services Administration, which has authority over such ADP procurement matters, has agreed with our position. PTO's official position, as stated in an April 10, 1985, letter to us is that PTO does not believe that exchanges are procurements under the Brooks Act. Consequently, none of the exchange agreements were developed with the procurement regulations in mind. Furthermore, in reviewing PTO's actions, we concluded that PTO did not obtain maximum practical competition as required by the Federal Procurement Regulation on two of the three procurements.

PTO also agreed to terms that restricted its control over its resources, adversely affected public access to data, and were uneconomical. For the last few years, PTO made certain data tapes available for sale to the public. PTO accepted a provision that required it to fix higher prices for future sales to the public of these data tapes. Also, because of the provision restricting public access, PTO had to ask the private companies for permission to provide the public access to the full range of capabilities of its $10 million search system. The companies assented only after PTO agreed to a charge to the public. The charge included royalty payments to the companies with an estimated present value of $3.18 million. There are other restrictions limiting PTO's ability to distribute data tapes.

PTO recently announced that it intended to negotiate the purchase of additional rights to the trademark data from the companies, thereby lifting some or all of the existing restrictions. Whether this negotiation will be successful had not been determined as of April 12, 1985.

requirements and cost/benefit analyses do not furnish an adequate basis for determining whether the results will achieve the initially established goals: improved registration quality, cost-effectiveness, and reduced application processing time. Correcting the deficiencies we have noted will require incorporating information beyond that contained in PTO's original analyses; this includes a comprehensive, functional description of the requirements to support the systems' use by PTO personnel and by the public. It should also employ the appropriate methodology in the cost/benefit analyses.

PTO's acceptance of equipment without adequate testing is illustrative of the problems in PTO's management of trademark automation. Failure to adhere to accepted principles in such areas has exposed PTO to risks of substandard performance in the completed system, and has contributed to the currently deficient search system.

The manner in which PTO has administered its exchange agreement authority in obtaining machine-readable data bases for its trademark systems has also created problems. PTO did not achieve the maximum practical level of competition in two of its three exchange agreements. Also, the specific terms of the exchange agreements created additional problems. The most visible of these is the restriction (accepted by PTO as part of the exchange agreements) on PTO's freedom to offer information on trademarks to the public.

PTO is attempting to redress some of these problems by renegotiating the restrictive elements of the exchange agreements. However, it is clear that at least some of the underlying causes are not being treated. Specifically, PTO persists in claiming that its exchange agreements for ADP resources are not procurements subject to the Brooks Act and to its applicable regulations. As previously noted, we disagree with this position. We are concerned that PTO may choose to execute future exchange agreements without complying with applicable procurement regulations and thus evade the procedures designed to ensure the maximum practical competitiveness and cost-effectiveness of its procurement actions.

RECOMMENDATIONS

To help ensure that automation goals and appropriate procurement practices are met, we recommend that the Secretary of Commerce direct the Acting Commissioner of Patents and Trademarks to:

--Reanalyze thoroughly the cost and benefits of PTO's trademark automation activities and ensure that any additional expenditures are justified. This analysis should (1) include updated cost information estimated according to standard practices, (2) incorporate the views of Trademark

Commissioner of the Patent and Trademark Office, and other interested parties, and will make copies available to others upon request.

Sincerely yours,

Acting Comptroller General
of the United States

APPENDIX I

reports to the agency head, the PTO Commissioner. The automation program is designed to support PTO's two primary operational programs: granting patents and registering trademarks (responsibilities of the Assistant Commissioners for Patents and Trademarks). The primary users of PTO's automated trademark systems are under the Office of the Assistant Commissioner for Trademarks (hereafter the Trademark Office).

In addition, the office responsible for automatic data processing (ADP) contracting at the Department of Commerce, with the assistance of the PTO automation staff, developed and implemented contracts (except exchange agreements) for resources until October 1984. At that time, PTO established an in-house contracting office which is now responsible for all trademark automation contracts, except exchange agreements. This office reports to the Assistant Commissioner for Administration. PTO does not consider the exchange agreements to be procurements. The Automation Office developed and implemented the agreements that were signed by the Commissioner. According to PTO officials, the contracting office of the Department of Commerce was not involved in the exchanges, and the PTO contracting office only recently (December 1984) became involved when PTO decided to buy items that it originally sought to obtain through exchange agreements.

During 1982, PTO's Automation Office developed the Automation Master Plan to guide automation over the next 20 years. The plan discussed PTO's mission, general organizational requirements, automation management, and work tasks, and included a cost/benefit analysis of PTO automation. As part of the plan, PTO established three major goals for its trademark automation effort--improved registration quality, cost-effectiveness, and reduced application processing time. The plan, which was reviewed by several automation experts from other agencies and the public, stated that PTO should complete the task of specifying user requirements.

Since 1981, PTO has developed three systems to improve trademark operations. In total, these systems and related support cost over $9 million during fiscal years 1983 and 1984, according to a February 1985 PTO briefing document on trademark automation.[4] The most expensive of the three systems--the trademark search system--was developed to improve PTO's trademark search activity, a key step in the registration process which involves comparison of an applicant's trademark to other applications and the approximately 600,000 existing, registered trademarks to determine if the same or confusingly similar trademarks have already been applied for or are registered.

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[4]We did not attempt to determine PTO's 1981 and 1982 agency-wide costs, such as the cost of PTO's planning that culminated in its December 1982 Automation Master Plan. The Assistant Commissioner for Finance and Planning stated that PTO did not incur costs prior to 1983 for the current monitoring system (an upgrade of an earlier PTO system) or its other automated trademark systems.

searching according to its announced intentions, the effect of the public access restriction might have been to force the public to do business with one of the companies or forego the more effective trademark search techniques. In response to outcries from the trademark industry, PTO is considering allowing full-search access for a fee. The public currently uses PTO's manual search files and those elements of the automated system that are fully operational.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our review responds to a July 11, 1984, request from the Chairman of the House Committee on Government Operations and subsequent discussions with his office. The objectives of our review were to evaluate the (1) adequacy of PTO's analyses of trademark systems' user requirements, (2) adequacy of PTO's 1982 analysis of the costs and benefits of trademark automation, (3) propriety of PTO's exchange agreements for a trademark data base, and (4) effectiveness of PTO's trademark automation contracting.

We reviewed PTO's evaluation of user needs, its 1982 cost/benefit analysis of trademark automation, and the three trademark data base exchange agreements. We did not review all PTO exchange agreements. We performed our review from August 1984 to April 1985, primarily at PTO in Arlington, Virginia.

In conducting this review, we interviewed PTO officials, trademark company officials, and officials representing trademark associations; reviewed their files; and analyzed PTO's automation planning documents and applicable federal laws and regulations.[5] We also obtained several sworn statements from individuals on key areas of controversy where we had received conflicting information.

With respect to user requirements, we analyzed PTO's requirements analyses to ascertain their completeness and the reasonableness of the assumptions used. We also contacted system users to determine their input and resulting impact on the development of PTO's systems. With respect to automation cost-effectiveness, we analyzed the cost/benefit analysis section of PTO's 1982 Automation Master Plan and reviewed available analytical documented evidence. With respect to exchange agreement propriety, we reviewed the previously cited laws and regulations and compared PTO's actions to these requirements. We also contacted industry and private-company representatives to confirm the information provided by PTO officials and to determine industry awareness of PTO's intent to enter exchange agreements and the impact of industry awareness on agreement competitiveness. Finally, with respect to PTO's automated search system, we reviewed the system contract, monitored some aspects of PTO's November 1984 system testing, and contacted users

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[5]The applicable laws and regulations included 40 United States Code Section 759 (the Brooks Act), Public Law 96-517, Public Law 97-247, Federal Procurement Regulation Subparts 1-1 and 1-4, and Federal Property Management Regulations Subpart 101-35.

a change order for the contractor to modify the system to reflect the July 1984 guidelines. In October 1984, after completion of about $11,000 worth of work in this area, PTO cancelled this change order provision until it could resolve the public-access issue. As of April 1985, a final determination had not been made on the degree of modification which PTO's search system will undergo to allow full use by the public. An official from PTO's Automation Office told us he expected that the system changes required will be significant enough to require another contract modification.

PTO's two other trademark systems--the monitoring and retrieval systems--were also deficient, at least partially because of inadequate requirements analyses. According to Trademark Office officials, the monitoring system does not provide an adequate text-editing capability and, according to the Assistant Commissioners for Administration and Trademarks, the retrieval system does not produce the quality of paper required by and promised to public users. In developing the monitoring system, PTO did not identify all essential features needed for its computer terminals used for data editing until after it bought $46,000 worth of terminals that did not have the necessary capabilities, according to PTO officials. Consequently, PTO stored most of these terminals in a warehouse for about a year until it found another use for them. In addition, Trademark Office officials told us the terminals currently in use also do not have an adequate editing feature and have contributed to an unacceptably high input error rate, resulting in a $327,214 contract to verify and correct the errors. The Assistant Commissioner for Finance and Planning noted that these replacement terminals are scheduled for another replacement in August 1985. Similarly, in developing the retrieval system, PTO purchased microfilming equipment and a small computer for $137,000 before discovering that the system's hard copy printouts do not meet the needs of public searchers. Thus, according to PTO officials, the computer, which cost at least $67,000 is rarely used. The Administrator for Automation said that PTO currently plans to use the system for other purposes.

We also found indications that PTO recognized the incompleteness of its requirements analysis. PTO's Administrator for Automation, in a March 1984, internal memorandum, stated:

> "The lack of a consolidated, coherent functional requirement document, as was developed for patents, is a continuing handicap in Trademarks. This lack was the result of the more disjunctive approach to developing the Stage 1 Automated Trademark System (ATM) at the outset of the program. From a systems point of view, it would have been more efficient, over the long haul, to have deferred the development of the ATS system, including especially TRAM [the monitoring system], until the long-range concepts was [sic] solidified. Of course, that would have delayed all aspects of Trademark automation and the consequent benefits from it. This was a major consideration in following the current course."

and proofreading costs that probably would continue indefinitely. When we presented this information to the Administrator for Automation, he reiterated his opinion that overall costs would be reduced over time by the initial estimate of about one-third of the budget annually. He added that although the Trademark Office officials may be correct about the offsetting costs, he still anticipated significant cost savings even though he could not specify when or exactly where they would occur.

Internal PTO disagreements over cost-savings assumptions are important because the different assumptions produce very different results. For example, if the 1982 cost/benefit savings estimate of $77 million is recomputed using current cost data, an estimating methodology that properly incorporates discounting, and a more conservative estimate that there will be a 10-percent reduction annually in Trademark Office operating costs (according to Trademark Office officials, the highest achievable percentage), the original estimated cost reduction becomes a cost increase. We could not determine the reasonableness of the assumption of either group of officials because there was insufficient evidence offered to support either set of assumptions.

Views of PTO officials on actual automation impacts to date also differ. On April 12, 1985, the Assistant Commissioner for Finance and Planning stated that the contract required for printing a recurring publication with annual costs of about $700,000, was being eliminated because PTO was now performing the contractor functions. He added that PTO will achieve actual savings from this contract cancellation even though there are some offsetting costs and stated that PTO related these actual savings to the Congress in a report on its automation progress. In contrast, the Assistant Commissioner for Trademarks stated that the contract cost savings is more than offset by about $1.3 million in new costs PTO was incurring to perform the functions.

With respect to the issue of discounting, the Administrator for Automation told us that PTO's 1982 analysis did not discount the 20-year gross savings projection to reflect the time value of money. We discounted the 1982 projections and found that the $77 million savings indicated in PTO's 1982 analysis is reduced to less than $41 million by such discounting.[6] The Administrator for Automation stated that PTO did not develop a more refined cost/benefit analysis because PTO's primary goal for trademark

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[6]Discounting is a standard practice by which expected future cash flows are estimated and reduced to reflect the time value of money. The estimate involved converting 1982 dollars to future dollars using an average annual inflation rate of 5.1 percent and then discounting at 11.03 percent. The inflation rate was derived by estimating federal pay increases because savings were based on personnel savings. The discount rate was based on U.S. Department of Treasury (bill and note) borrowing rates at the time of the study.

PROBLEMS EXPERIENCED WITH EXCHANGE AGREEMENTS

PTO's three exchange agreements with private companies to develop a trademark data base are non-monetary, barter-type agreements for the procurement of commercial ADP support services.[7] We found that (1) PTO did not accurately value all exchange provisions, (2) the development of the first exchange could have been improved, (3) PTO did not achieve maximum practical competition on the second and third agreements, and (4) PTO did not adequately consider all future impacts of the exchange agreements on PTO and the public. In addition, PTO has not established criteria for deciding what kinds of transactions are appropriate for exchanges. Furthermore, PTO does not consider exchanges to be procurements.

In January and May 1983, PTO signed exchange agreements with N.V. Compu-Mark S.A., Thomson and Thomson, and Trademark Computer Research Service, Inc., to develop computer tapes from PTO's trademark data for a machine-readable data base. PTO officials told us that exchange agreements were used as an appropriate exercise of its exchange authority primarily because funds were not available[8] to pay for the data base and because PTO considered the agreements an economical approach.

Under the exchanges, Compu-Mark "key-entered" onto a computer tape PTO's existing registered trademark text data, such as the words comprising the trademark; Computer Research agreed to key-enter PTO's future trademark application text data for the next 10 years; and Thomson agreed to digitize and code existing and

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[7]For additional details, see letter opinion, dated March 13, 1985, from the General Accounting Office's General Counsel to the Chairman, House Committee on Government Operations (B-217448). Also, the General Counsel of the General Services Administration agrees that the agreements are contracts for the procurement of commercial ADP support services. In an April 10, 1985, letter to the General Accounting Office, the Solicitor of PTO concluded that the exchange agreements are not procurements.

[8]In a February 13, 1984, letter to the United States Trademark Association, the then-Commissioner stated, "The overriding reason why the PTO chose the exchange-agreement method of acquiring the computerized trademark data base was because...the Office could not project sufficient resources in fees and appropriations to pay the $3 million to pay for the creation of the computerized trademark data base."

Exchanges were not equal

PTO officials and the exchange agreements stated that items of equal value were exchanged. We found, however, that PTO initially placed no value on the agreements' provisions that restricted public access to PTO's automated search data base to "comparable and equivalent" access methods. Yet, through subsequent negotiations with the private companies, PTO and the private companies valued these provisions at $3.18 million. In essence, because these provisions only benefited the companies, they received about twice the value that they provided to PTO. (Industry officials questioned the value of other agreement provisions. Because no clearly valid estimate of value was available for such provisions, we concentrated on the valuation of the public restriction provision.)

In June 1984, after an outcry from the trademark industry regarding restricted access, PTO estimated that it could key-enter its own data base for $3.18 million and allow the public full use of its search system, according to the Assistant Commissioner for Finance and Planning. After PTO explained this to the companies, Compu-Mark and Thomson agreed that the public could be allowed to access the exchange agreement data with more advanced trademark search software at PTO headquarters. For this access, PTO agreed to collect royalty fees from the public totaling $6.04 million over 10 years with a present value of $3.18 million. (Current negotiations of the previously mentioned sole-source procurements may result in a different final value of the restricted access provisions.)

The Assistant Commissioner for Finance and Planning stated that the agreement valuations were based on values estimated by the receiving parties and that subsequent valuations of the restriction provisions should not be combined with the initial gross estimates of value. We disagree. We believe the subsequent valuations clearly demonstrate that PTO's initial valuations were incomplete and indicate that PTO provided greater benefits than it received.

The development of PTO's first exchange could have been improved

PTO's exchange agreements are contracts for the procurement of commercial ADP support services and are subject to the Brooks Act and the Federal Procurement Regulation.[12] The Brooks Act vests the

[12]See 41 Code of Federal Regulations Subpart 1-4.12, et seq.. This Subpart was in effect when the exchange agreements were signed in 1983. Effective Apr. 1, 1985, it was replaced by new provisions of the Federal Information Resources Management Regulation (FIRMR). Also, Subpart 1-4.12 incorporates by reference the other provisions of the Federal Procurement Regulation. The regulation was replaced by the Federal Acquisition Regulation, effective April 1984.

Prior to the first exchange, PTO contacted several companies to discuss its overall ADP resource needs. During 1982, PTO did not publicly announce that it was interested in proposals for exchanges to acquire a computer data base of its current trademark records. However, when PTO publicly announced the exchange agreement with Compu-Mark in January 1983, it invited other companies to submit proposals for exchanges that were the same as or equivalent to the Compu-Mark arrangement. According to PTO, no companies responded to this initiative. Several company officials told us that, had they known that PTO wanted proposals for exchanges before the agreement with Compu-Mark had been consummated, they probably would have competed. We believe that, had PTO disseminated its needs and interest in entering into exchange agreements before signing the Compu-Mark agreement, it might have achieved more favorable terms on its first exchange.

During 1982 PTO relied on the knowledge of its executives and contacted, at different times, 12 companies that it considered interested and capable and discussed general trademark automation needs, such as software, hardware, and data bases. According to PTO's Administrator for Automation, as a result of these discussions, PTO agreed to an exchange with Compu-Mark in December 1982. Several weeks later, in January and February 1983, respectively, PTO announced in the Commerce Business Daily and the Official Gazette (an official PTO publication) the Compu-Mark agreement and its interest in entering into the same or equivalent agreements with other companies.[15] PTO officials told us that because no companies responded to these invitations, PTO's private negotiations in 1982 effectively included all appropriate companies.

Because PTO claimed that all interested and capable companies had been contacted in 1982, we contacted industry officials to verify that PTO's efforts had been effective. Officials from five companies--Datatrust, Computer Research, a third company that was contacted early in 1982 regarding a contract (but not an exchange), and two other companies that were not contacted in 1982 by PTO--told us they would have been interested in directly competing for PTO's first exchange agreement with Compu-Mark if they had been informed of PTO's needs and its interest in reaching an exchange agreement. The officials from companies that had been contacted in 1982 stated that PTO did not provide an opportunity to compete in 1982 because PTO did not advise them of the Compu-Mark agreement and its details. PTO officials stated that all companies had an opportunity in 1983 when PTO publicly invited equivalent proposals in its two early 1983 announcements of the Compu-Mark agreement.

We learned that three companies--Thomson, Computer Research, and Datatrust--which were in contact with PTO during 1982 (in

[15]The February 1983 announcement stated, "The PTO would welcome proposals from other interested suppliers to provide the same or equivalent materials and services. Proposals received by Mar. 31, 1983, will be evaluated and considered by the Office."

agreement?...however, none of the four companies were interested in doing so. More general discussions were held with representatives of several other firms....In sum, no company was restricted from opportunities to provide any part of the trademark data base."

Because these discrepancies regarding verbal negotiations in 1983 could not be reconciled, we could not conclude whether PTO's public invitation to consider proposals that were the same as or equivalent to Compu-Mark's was genuine and was offered to assure that PTO would obtain services that were competitive with those being provided by Compu-Mark. We believe that, had PTO made its needs and interest in entering into exchange agreements better known before signing the Compu-Mark agreement, it might have achieved more favorable terms for the first exchange. The approach PTO followed may not have been, in our view, the most effective approach that could have been taken to obtain the best bargain for the government.

PTO did not achieve the required maximum practicable competition on its last two trademark exchanges

PTO's second and third exchange agreements are also contracts for commercial ADP support services, which are subject to the Brooks Act and the Federal Procurement Regulation. We believe that PTO did not obtain maximum practicable competition on these exchanges because of the following reasons.

--PTO did not publicly announce that it was seeking proposals for the kinds of data to be provided under the Computer Research and Thomson agreements. Although the January and February 1983 notices in the Commerce Business Daily and the Official Gazette, respectively, announcing the Compu-Mark agreement invited proposals from other interested firms for materials and services that were the same as or equivalent to Compu-Mark's offer, the Computer Research and Thomson offers were not the same or equivalent proposals. Compu-Mark would provide PTO with a computer data base of the text of all trademarks active at the time of its agreement. On the other hand, during a 10-year period, Computer Research and Thomson would, respectively, furnish PTO with (1) computer tapes of text information contained in future trademark applications and other trademark documents and (2) computer tapes of images of active trademark registrations and trademark applications which contain design elements as well as image coding.

--PTO had limited contacts with companies regarding the preparation of computer tapes of images or of future trademark applications and other documents. According to PTO officials, PTO's contacts were confined to a total of

Impacts on PTO and the public not adequately considered

PTO's exchange agreement contracts have had, and may continue to have, significant impacts on PTO, the public, and the trademark industry that are unrelated to the primary purpose of the exchange--the acquisition of a trademark data base. Through provisions agreed to by PTO in the exchange contracts, PTO effectively (1) relinquished some control over the use of some of its ADP resources, (2) fixed the price it charged the public for automated data tapes at seven times the previous price, and (3) restricted its ability to use available and new information technologies to disseminate trademark data. In addition, PTO's administration of these agreements has been deficient because PTO did not carefully and thoroughly plan and implement the agreements.

One important agreement provision restricted the public's access to the resulting data base, thereby restricting PTO's control over some of its ADP resources. While each agreement used slightly different language, the provisions were substantially the same in stating that:

> "Terminals made available to members of the public for the purpose of using data elements derived from...[the agreements]...will be used only with search techniques comparable and equivalent to the present manual paper file searching in the PTO Trademark Search Library."

Company officials explained that this provision was important to them because the companies initially required assurances that PTO would not offer its advanced trademark search capability to the public. PTO's Administrator for Automation told us that, although PTO initially agreed to this restriction, PTO wanted to continue to provide the public with a search capability "comparable and equivalent" to the capability offered through manual searching. The public has always been allowed free access to PTO's manual search files.

In 1983, when PTO signed the agreements, with terms extending to 1993, it effectively agreed to restrict the public's use of its then planned search system. In 1984, after an outcry from the trademark industry regarding PTO's planned restrictions on public access, PTO decided to provide the public with full access to its automated search system. Nevertheless, because of the exchange agreements' public-use restrictions, PTO was required to renegotiate with the companies to obtain approval on the type and cost of public access to PTO's automated search system. Thus, because of the restrictions, PTO effectively had to seek permission from the companies before it could provide the public with the full range of capabilities of its $10 million search system.

In June 1984, the initial restrictions were amended by PTO's agreement to collect a royalty fee for the companies from the public for the public's access to the trademark data using the more

In addition, PTO would have been free to use existing and new technologies, such as remote access to the search system through microcomputers, to disseminate trademark data.

Administrative problems

In reviewing PTO's trademark exchange agreements, we also noted several administrative deficiencies. First, PTO has yet to establish criteria defining when exchanges rather than monetary government procurement contracts should be used. The Assistant Commissioner for Finance and Planning said PTO uses exchange agreements when the planned exchange meets the intent and provisions of PTO's exchange agreement authority and when no money is involved. We question the effectiveness of such general guidelines. For example, under the present exchange agreements PTO ultimately plans to pay money for exchange items even though PTO initially intended to exchange only items and services. Furthermore, PTO's legislative authority does not effectively substitute for guidelines on when exchanges should be used because the legislative authority does not specify the circumstances under which exchanges are most appropriate. The authority states that the PTO Commissioner, "shall have the authority to carry on studies, programs, or exchanges of items or services regarding domestic and international patent and trademark law or the administration of the Patent and Trademark Office...."

In addition, while PTO's exchange agreement policy of May 2, 1983, described exchange agreements and explained how PTO intended to administer its exchange authority, it did not specify what kinds of transactions are appropriate for exchanges. Furthermore, this policy was not publicly announced until May 5, 1983--3 months after its first exchange agreement was signed and only a few days before its second and third agreements were signed.

Second, at the time of the signing of its exchange agreements, PTO had not resolved basic contractual requirements, such as specifications for keying and the definition of "comparable and equivalent" public access. When PTO later specified the keying instructions, it had to agree to provide additional goods and services as payment to one agreement partner.

Third, the primary control feature in the agreements is a provision requiring best efforts by each party. We believe controlling these contracts through what PTO officials describe as a "gentleman's agreement" approach is risky because it does not specify obligations or establish incentives to assure quality and timely delivery of data or allow PTO the right to effective redress for unsatisfactory performance. For example, PTO could not ensure delivery (and actually did not initially schedule timely delivery) of critical image data for its acceptance test of its trademark search system that PTO accepted in June 1984. (The acceptance test is the subject of the next section.)

According to a private consultant who assisted PTO in its tests, PTO's first test of hardware, operating software, and text retrieval features was conducted on May 16, 1984, under the following "constrained" conditions:

--PTO tested only text searching.

--The text data base was incomplete and partially inaccurate.

--Only 18 of 61 search terminals were tested simultaneously.[20]

During testing, PTO identified several areas where the system did not satisfy, or only partially satisfied, functional requirements identified in the contract. Specifically, the system could not search across a range of trademark classes, nor could it search words that had three or more consecutive letters or numbers (such as AAA or 777). In addition, while the system met a 16-minute search timeliness requirement, the average completion time of 14.7 minutes was achieved only under the above constrained conditions. PTO officials told us that if images had been included during the first test, the system probably would not have passed. Also, the test team noted that as the number of terminals increased, response time slowed, a further indication that the constrained conditions assisted the system in passing the acceptance test.

Even though the trademark search system did not pass all requirements, PTO, in a June 21, 1984, letter stated that, "tests were conducted in accordance with the specifications of the RFP [request for proposals] and all requirements were satisfied. Based on the results of the acceptance testing, the PTO accepts the Trademark Search System." This acceptance letter did not state that only the text retrieval component was accepted or that certain functional requirements needed further correction. PTO contracting officials told us that the total system had been accepted, regardless of the outcome of the second acceptance test. PTO's Test Director explained that PTO accepted the full system because the shortcomings were minor and PTO assumed that they would be addressed later by the contractor. However, the Assistant Commissioner for Trademarks wrote an internal memorandum on June 22, 1984, that she concurred with acceptance of the text retrieval component, provided that the identified problems would be corrected and the image retrieval component tested before the full system was accepted.

On November 28, 1984, PTO began its second test. PTO tested the same requirements (except for the previously tested text retrieval features) and added the image retrieval feature. This test was also conducted under "constrained" conditions. Many of the design codes which are the basis for image searching were

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[20]Although 70 terminals are required by the contract, 9 terminals are planned for administrative use.

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