The ADA Dual Use Program

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EXECUTIVE SUMMARY

The primary objective of the Ada Dual-Use Program is to increase the use of the Ada programming language and the software engineering principles it embodies, in the defense and commercial sector. The commercial sector, for the purpose of this plan, refers to all organizations outside of the DOD including academic institutions, industry firms, and other Government agencies. The rationale for pursuing this goal is that commercial investment in Ada technology reduces DOD's software costs while providing commercial organizations with a competitive advantage through the leveraging of Ada's intrinsic benefits. The DOD has based its plan for accomplishing this goal on the premise that it would enter into joint ventures and form partnerships with organizations from other Government agencies, with industry, and with the academic community to increase Ada usage. These ***strategic dual-use partnerships*** will increase the market push and corresponding market pull for Ada technology. Each organization entering into these partnerships will share in the risk and subsequent rewards of the arrangement. As the DOD builds and leverages the strength of these partnerships, the Ada language will penetrate the commercial market, resulting in mutual benefit for the DOD and its dual-use partners.

This program plan is itself a product of joint involvement. The Defense Information Systems

Agency invited Government, academic, industry, and vendor community representatives to participate in the Ada Dual-Use Workshop on October 19 - 20, 1993. The workshop gathered input from members of the represented communities on how to best increase the commercial use of Ada. Participants presented recommendations regarding the method and focus that the program should follow in achieving its objective. In response to the testimony of the participants, DISA developed a detailed program plan with specific thrusts, areas, activities, and tasks. The program thrusts, aimed at increasing the use of Ada, are described below.

> ***Increase marketing*** promotes Ada outside of the DOD and uses a hard-hitting business case to catch the attention of commercial firms.
>
> ***Establish partnerships*** forges DOD alliances in the academic, Government and industrial sectors that create Ada products that can be shared by both partners.
>
> ***Provide support and incentives*** increases the market appeal of Ada by developing bindings and tools that expand its usability.
>
> ***Re-enforce commitment*** provides implementation guidance and training to ensure consistent interpretation and application of the Ada mandate within the DOD.
>
> ***Maintain current AJPO activities*** continues support for on-going AJPO tasks aimed at developing the Ada 9X standard and supporting the existing user base.

A five-year plan with strategic direction and a two-year plan with specific, detailed tasks are provided for each activity defined in these thrusts. The plans describe actions that strengthen Ada's current support base and target new opportunities for Ada in the commercial sector. The AJPO Director, responsible for oversight of the program, will employ a systematic and controlled approach in managing the program's activity. A WBS consisting of short, discrete tasks with clearly defined measures of success, along with established organizational roles and periodic progress reporting, assist in ensuring program success while mitigating potential risks.

The Ada Dual-Use Program Plan offers a well-conceived strategy for increasing the commercial use of Ada that is based on the collective experience and recommendations of 175 experts from the industry, vendor, academic, and Government communities. The tactical approach of the plan employs five thrusts that combine to address all factors that will impact Ada's penetration into the commercial sector. These thrusts, coupled with the plan's controlled management approach, maximize the chances of achieving the program's objectives.

To realize the goals of this plan, the DOD's committed investment in each of these thrusts is essential. Without it, the success of the entire program is in jeopardy along with the investments that the DOD has already made in the development of Ada technology. The Ada Dual-Use Program Plan is effective, controlled, and well-planned. It will popularize the use of Ada and

maximize DOD's return on investment.

1.0 INTRODUCTION

The overall objective of this plan is to increase the use of the Ada language and the software engineering principles it embodies, in defense, commercial, and educational applications.

1.1 Purpose

Sustain DOD's successful uses of Ada and leverage DOD's investments to expand private investment to create, market, and support dual-use products.

One of the recurring comments made by participants at the Ada Dual-Use Workshop was "the DOD is doing the right things, they just need to do more of it." The Ada Dual-Use Program Plan is founded on this theme -- it ***sustains*** DOD's successful uses of Ada and ***expands*** private investment in dual-use technology by ***leveraging*** DOD investments. Utilizing this philosophy, the plan:

Builds on the success of a proven winner -- Ada

Creates dual-use partnerships that increase DOD leverage

Maximizes return on investment by taking advantage of the "second window of opportunity" provided by the convergence of Ada 9X and evolving software engineering technology

These three elements of the Ada dual-use strategy form the framework of this program plan.

1.2 Background

Ada is a proven winner.

Ada is a ***proven winner*** for software development. The average cost of Ada software is 25% less than the norm and the quality is 30% higher. Numerous examples of successful Ada applications have been documented in conference proceedings, journal articles (e.g., Tri-Ada Proceedings and SIGAda notes), and by the Ada Information Clearinghouse (AdaIC). As a result of these successes, the Ada market is growing:

The current market for Ada compilers and tools is about $300 million per

year, and there are approximately 50,000 Ada users today.

The DOD has more than 500 documented successes of Ada's use in DOD applications.

The Ada commercial market is growing. In 1986, there were only 13 commercial applications written in Ada. Today there are more than 100 large commercial software systems coded in Ada.

Ada has a proven success record in commercial and defense applications such as:

Automated Manufacturing and Materials Handling Systems
Commercial Cellular Phone Switching
Geophysical Exploration
NASA's Space Station Applications
Payroll Systems
Real-Time Continuous Medical Monitoring Systems
Strategic Military Embedded Systems

The Ada Dual-Use Program Plan builds on these successes and uses them as a springboard to gain greater support. As this plan solidifies the current Ada support base, it expands private investment by leveraging DOD investments in dual-use products.

1.3 Document Organization

This document presents the DOD's Ada Dual-Use Program Plan which will be managed by DISA. It describes a 5-year projection and a 2-year task level plan. The Ada Joint Program Office (AJPO) will annually update the plan to ensure that it continues to support the objectives of the program.

Section 1.0 establishes the context of the document. It provides the background and ***purpose*** of the program. There is also a brief section acknowledging those individuals and organizations that played a role in producing the program plan.

Section 2.0 details the ***strategic approach*** that will guide the DOD, DISA, and the AJPO in executing the program. It outlines the dual-use strategy.

Section 3.0 describes the ***tactical approach*** that the DOD, DISA, and the AJPO will follow to increase the use of Ada. DISA has organized the tactical approach into five major thrusts summarized as follows:

1. ***Increase Marketing*** promotes Ada outside of the DOD, improves Ada's image, and uses a hard-hitting business case to catch the attention of

commercial firms.

2. ***Establish Partnerships*** forges DOD alliances in the academic, Government and industrial sectors to create Ada products that can be shared by both partners.

3. ***Provide Support and Incentives*** increases the market appeal of Ada by developing bindings and tools that make it more marketable.

4. ***Re-enforce Commitment*** provides implementation guidance and training to ensure consistent interpretation and application of the Ada mandate within the DOD.

5. ***Maintain Current AJPO Activities*** continues support for on-going AJPO tasks aimed at developing the Ada 9X standard and supporting the existing user base.

Each thrust is divided into areas which are further sub-divided into activities. Each activity has associated with it a list of deliverables and measures of success. Activity plans are presented with 2-year and 5-year goals. The 2-year goals include detailed tasks with an assigned priority.

Section 4.0 highlights the ***management approach***. The program management section details the organization and processes that will be employed to manage the program's activity. Explanation of management concepts is provided, including how tasks were prioritized. A diagram illustrating all the tasks and their corresponding priorities is provided. The risk management section provides a risk matrix and identifies the current risks of the program plan.

Section 5.0 provides the ***integrated program schedule*** for the overall program. A Gantt chart is provided containing the thrusts, areas, activities, tasks, and major milestones for the first two years of the effort.

Appendix A contains the ***Ada Dual-Use Task Summary***. This appendix describes the 48 tasks that fall under the 12 activities described in section 3.0. Consequently, this appendix is structured in much the same way as section 3.0. The tasks are organized by thrust, area, and activity. Each task has a priority, a description, a duration, and a list of inputs and deliverables.

Appendix B contains a list of the ***applicable documents*** that are referred to or impacted by the Ada Dual-Use Program Plan.

Appendix C contains a ***glossary*** of terms used in this document.

Appendix D contains the list of ***acronyms*** used in this document.

Appendix E contains the list of ***references*** used in this document.

Appendix F contains the ***job descriptions*** for the AJPO organization shown in section 4.0.

Appendix G contains ***liaison committee descriptions*** referenced in section 4.0.

Appendix H, ***resource summary***, provides the only financial information in the document. This appendix contains funding charts and budget summaries. Because of the sensitivity of this information, distribution is limited to Government personnel.

Because of the diversity of stakeholders involved in the Ada Dual-Use Program, their interests in the various topics outlined above will differ. For this reason, Table 1-1, shown on the next page, provides a roadmap that guides the reader through the document based on their respective interests.

1.4 Acknowledgements

The AJPO recognizes the following people and organizations for their inputs:

Participants at the Ada Dual-Use Workshop
Members of the Ada Dual-Use Steering Committee
Organizations that contributed to preparing the plan
Stakeholders who contributed ideas and suggestions
The AJPO, Ada Information Clearinghouse (AdaIC), and other members of the Ada community who reviewed preliminary drafts of this plan

The AJPO especially wishes to acknowledge the leadership and support of Mr. Emmett Paige, Jr., Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (C3I). His keen insight and strong support of Ada are greatly appreciated.

Program Plan Section	Targeted Audience DOD Exec	PEO/ PO/PM	Acad Partner	Ind Partner	Gov't Partner
Executive Summary	x	x	x	x	x
1.0 Introduction	X	X	X	X	X
1.1 Purpose	X	X	X	X	X
1.2 Background	X	X	X	X	X
1.3 Document Organization	X	X	X	X	X
1.4 Acknowledgements	X	X	X	X	X

2.0 Strategic Approach	X	X	X	X	X
2.1 Situation Analysis	X	X	X	X	X
2.2 Strategy for Dual-Use	X	X	X	X	X
3.0 Tactical Approach		X		X	X
3.1 Increase Marketing		X		X	X
3.2 Establish Partnerships		X	X	X	X
3.3 Provide Support and Incentives		X		X	X
3.4 Re-enforce Commitment		X		X	X
3.5 Maintain Current AJPO Activities		X		X	X
4.0 Management Approach		X	X	X	X
4.1 Planning and Control	x	X	X	X	X
4.2 Risk Management		X		X	X
5.0 Integrated Program Schedule	X	X		X	X
Appendix A: Ada Dual-Use Task Summary		X		X	X
Appendix B: Applicable Documents		X	X	X	X
Appendix C: Glossary		X	X	X	X
Appendix D: Acronyms		X	X	X	X
Appendix E: References		X	X	X	X
Appendix F: Job Descriptions		X			X
Appendix G: Liaison Committee Descriptions		X	X	X	X
Appendix H: Resource Summary	x	X			X

Table 1-1. The Ada Dual-Use Program Plan Road Map .

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2.0 STRATEGIC APPROACH

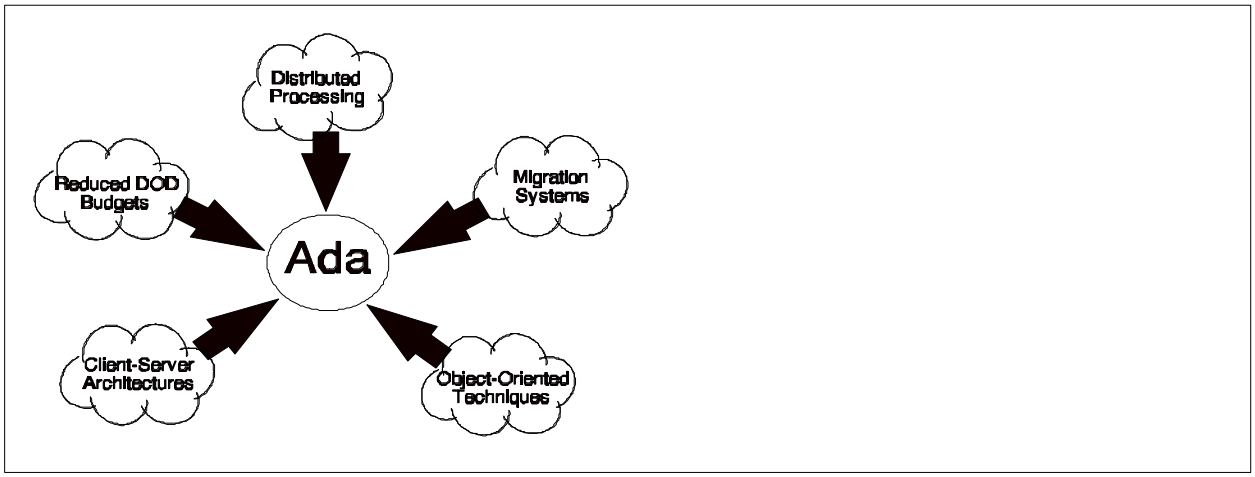
Increase the market push pull for Ada and related technology through strategic dual-use partnerships.

2.1 Situation Analysis

With change comes opportunity.

Recent changes, internal and external to the DOD, have created ***tremendous opportunities to expand the use of Ada and to increase the benefits that DOD and other users derive from Ada.*** The reduction of DOD budgets and downsizing of the military, the transition to migration systems, and the advent of object-oriented programming techniques, distributed processing, and client-server technology underscore the importance of this initiative. As a result of the factors shown in Exhibit 2-1, there exists a unique opportunity to refine the direction of DOD Ada usage

and to establish a solid Ada support base in the commercial sector. Private industry is struggling with the same issues of escalating software systems costs and declining quality as the DOD. All stakeholders foresee object-oriented, distributed processing, and client-server technologies as potential solutions. Information systems professionals will soon transition to the technology that will carry them into this new age of systems development, and ***the DOD must act immediately to take advantage of this window of opportunity***.



As budgets continue to decline and military forces are downsized, the DOD's ability to effectively maintain its support for the warfighter becomes increasingly more important. A key component of the DOD's mission rests in the capabilities of its software systems. Consequently, the cost-effective development and maintenance of DOD software has become an essential prerequisite for success. The DOD initially developed the Ada programming language to address this issue by providing the basis for reliable, maintainable, high-quality software systems. The reasons used to justify the development of Ada are still relevant and the results achieved to date with its use in the DOD and commercial sectors have been extremely favorable. Improvements in cost-savings, productivity, error reduction, and maintainability all indicate that Ada offers

significant advantages over other languages.1

The commercial firms that have used Ada in their systems have provided testimony to the advantages that can be attained with Ada. ***Ada has a distinguished record in private industry*** in systems such as:

Boeing's model 777 aircraft
Motorola's cellular phone systems
NTT's telecommunications systems
Reuters' financial trading systems
Shell Oil's seismic processing system
Silicon Graphics' virtual reality simulation applications
Wierton Steel's manufacturing systems

In addition to its history of successful applications, the transition to DOD migration systems, that the Deputy Secretary of Defense called for in a Memorandum dated 13 October 1993, also creates an opportunity for the expanded use of Ada. Ada is the optimum language for standardizing and re-engineering the selected legacy systems. Its inherent features and benefits along with its proven successes in the DOD domain make it the obvious transitional programming language. These benefits and success stories can also be applied to private industry as commercial systems begin the transition into the worlds of object-oriented, distributed, and client-server technology.

This transitional period is similar to that experienced in the mid 1980s, when executives were looking for new languages as they moved from mainframes to minis and PCs. At that time, they selected C over Ada because of its popularity and inexpensive tool support and because Ada was viewed as a DOD language. Today, executives are again examining alternatives as they migrate to client-server architectures, object-oriented techniques and other emerging technologies. C++ is extremely popular because it represents a natural migration path from C. DOD must entice executives to view Ada as an alternative to gain market share and attract them to their product. If competitively priced, the potential for Ada being selected increases because of the technical advantages it brings to the marketplace. Ada 9X benefits include:

Enforcement of sound software engineering principles that result in more reliable and maintainable systems

Object-oriented features that are equal or superior to those of other languages (in the Ada 9X revision)

Standard constructs that provide a powerful tool for developing reusable components

Inherent facilities that support concurrency and safety-critical systems

Current software market conditions are optimum for the proliferation of Ada, however,

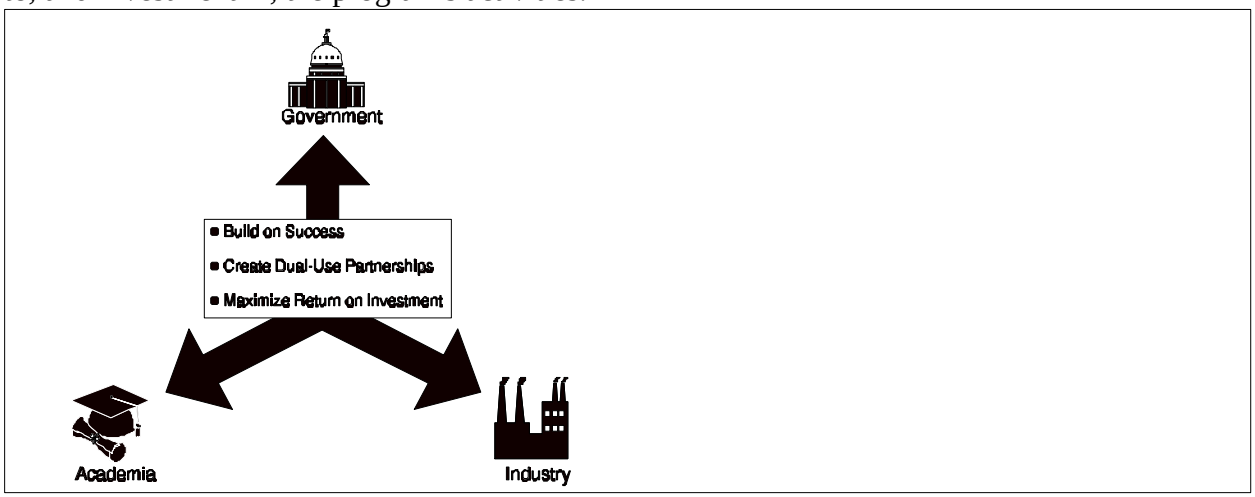
immediate action is required. The opportunities brought on by the changes described above spotlight the benefits of the Ada language, but delays in DOD action will result in that window of opportunity passing just as it did in the 1980s.

The DOD can ***maximize its return on investment*** in a strategy that capitalizes on this opportunity. Increased market penetration means reduced cost. Interest grows, along with the availability of venture capital, as a market grows. The bigger the market, the more money that is available to stimulate firms to capitalize on it.

2.2 Strategy for Dual-Use

Ensure that all stakeholders benefit.

This Ada Dual-Use Program Plan defines a concise strategy to commercialize Ada. The plan establishes near-term goals and provides the flexibility to expand and modify the strategy as conditions warrant. As shown in Exhibit 2-2, the strategy emphasizes the creation of ***joint ventures and partnerships that increase the leverage of the DOD*** and benefit all parties. It ***builds on the success and proven track record of Ada*** in DOD and commercial applications. In addition, it ***maximizes the DOD's return on investment*** by instituting an immediate commitment to, and investment in, the program's activities.



Within the scope of this program, the DOD will act as a ***venture capitalis***t by participating in joint ventures and partnerships with industry, academia, and other Government agencies. In doing so, the DOD will ***jointly fund efforts creating a market push for Ada technology***. These joint ventures and partnerships relieve the DOD of the burden of solely funding Ada projects. In addition, the probability of the program's success increases because all participants act as stakeholders with a vested interest in succeeding. Not only does the DOD realize benefits from these joint ventures, but the participating stakeholders do as well. Table 2-1, lists the respective investments and benefits of both parties engaging in these dual-use partnerships.

	DOD	Stakeholders
Investments	Funds Leveraged Investments (existing contracts, Government facilities, etc.)	Matching funds In-kind Investments (existing material, overhead, etc.)
Benefits	Reduced Software Costs Shortened Software Life Cycle Increased Software Maintainability and Reliability	Piggy-Backing on DOD Efforts Competitive Advantage Application of Leading Edge Technology

Table 2-1. Ada Dual-Use Investments and Benefits

Both dual-use partners will invest funds to support the joint venture. In addition, DOD will bring its leveraged investments, including existing contracts and Government facilities, to bear on the venture. The stakeholders will make both direct and in-kind investments such as materials and overhead costs. In return, however, both parties realize a significant return on investment. Combining investments provides both partners with benefits. The DOD can reduce its costs, shorten its life cycle, and improve its software quality by expanding on its current base of Ada technology and sharing the expense of developing new Ada starts with dual-use partners. The partnering organizations can "piggy-back" on DOD investments significantly decreasing their up-front investments and can apply leading edge technology to their products, research, and applications. In addition, the use of Ada provides organizations with an added enticement because it provides "significant opportunities for improving long-term competitiveness." ***Maximizing the return on investment for all stakeholders creates the cooperative and mutually beneficial scenarios*** that the strategy strives to attain.

The strategy will also employ a precisely focused marketing campaign to exploit the opportunities that exist for Ada in the current market. The marketing campaign will be conducted by an Ada trade association and will be supported by the AJPO for 2 years. The campaign will overcome the negative perceptions of Ada that are common throughout private

industry by stressing the language's proven advantages. The goal of the marketing effort is to ***create market pull*** to increase the demand for Ada products. As the market grows, it will encourage commercial vendors, academic institutions, and Government agencies to engage in partnerships with the DOD.

Without a strong commitment to Ada from within the DOD, the program's success will be in jeopardy. To cope with this problem, the strategy calls for DISA to provide implementation guidance and training to DOD components regarding the Ada mandate. The focus of these efforts will be geared toward program managers, as well as, acquisition and contracting personnel. ***By better communicating the intent and scope of the Ada mandate, the DOD sends a message to industry that re-enforces its commitment to Ada and encourages investments in Ada products.*** In addition, the strategy emphasizes the importance of on-going Ada efforts within the DOD, including the Ada 9X standardization efforts, the AdaIC, Evaluation and Validation, Ada Technology Insertion Program (ATIP), and the Ada 9X Transition projects. These AJPO programs must be maintained and supported to maximize the DOD's benefit from the dual-use effort. The program can then ***accelerate the success of Ada*** by solidifying the existing base on which it is founded.

The last major thrust of the strategy institutes a support and incentives program to encourage the development of Ada products. The DOD will encourage organizations to develop tools and bindings that make Ada a wise choice in the 1990s. This thrust also focuses on providing financial incentives for organizations to develop tools and environments that are comparable to those available for other languages on the market today. These ***support and incentives pull the Ada market*** toward affordable, high-quality Ada tools and environments.

The strategy for increasing the commercial use of Ada employs a 2-year window. The program plan forecasts activities for the current and next five fiscal years (1994 through 1999). It then provides specific task plans for the next two fiscal years (1994 and 1995). These tasks will increase the ***commercial use of Ada*** and provide a tangible ***return on investment*** for the DOD. The tasks are prioritized so that as funding is received, DISA is prepared to spend the funds in the highest priority area. As each year closes, DISA will re-evaluate and detail this program plan for the next year -- the 5-year plan will be extended accordingly.

As explained above, there are five goals of the Ada Dual-Use Program that must be met in order for the program to increase the use of the Ada language in the defense, commercial, and

Ada's visibility and acceptance in the commercial market must increase
Partnerships must help to spawn the commercialization of Ada
Ada 9X tools, environments, and bindings that appeal to both DOD and commercial users must be available when Ada 9X arrives on the market
Consistent interpretation of the Ada mandate must exist in order to re-enforce its use on DOD software efforts
The AJPO must solidify the support base that the current programs have targeted and continue its current efforts unabated

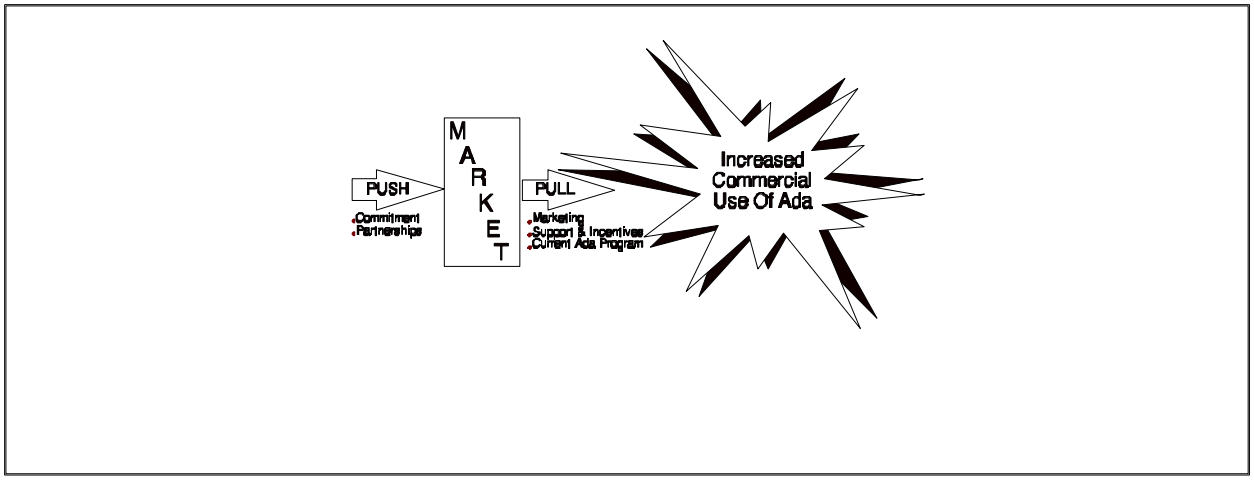
CRITICAL SUCCESS FACTORS

educational sectors. These goals, critical to the success of the Dual-Use Program, are: These critical success factors all work together to meet the program's objective. If any one of these factors is not satisfied, the success of the program will be in jeopardy. To ensure these critical success factors are being properly pursued, management will institute a ***well-planned, measurable, and controlled plan of attack*** (details of this management approach can be found in section 4.0). This management plan establishes measures of success, at the activity level which provide program level focus and direction. An activity's success or failure will be based on the extent to which these measures of success are satisfied. It is important to note the distinction made in this plan relative to activities and tasks. Activities are major efforts at the program level whose accomplishment can be ascertained via measures of success. Tasks are work elements of activities whose completion, when viewed in total, incrementally leads toward measurable progress.

The five thrusts of the Ada Dual-Use Program center around its critical success factors. The strategy for the Dual-Use Program revolves around these five thrusts:

Increase Marketing
Establish Partnerships
Provide Support and Incentives
Re-enforce Commitment
Maintain Current AJPO Activities

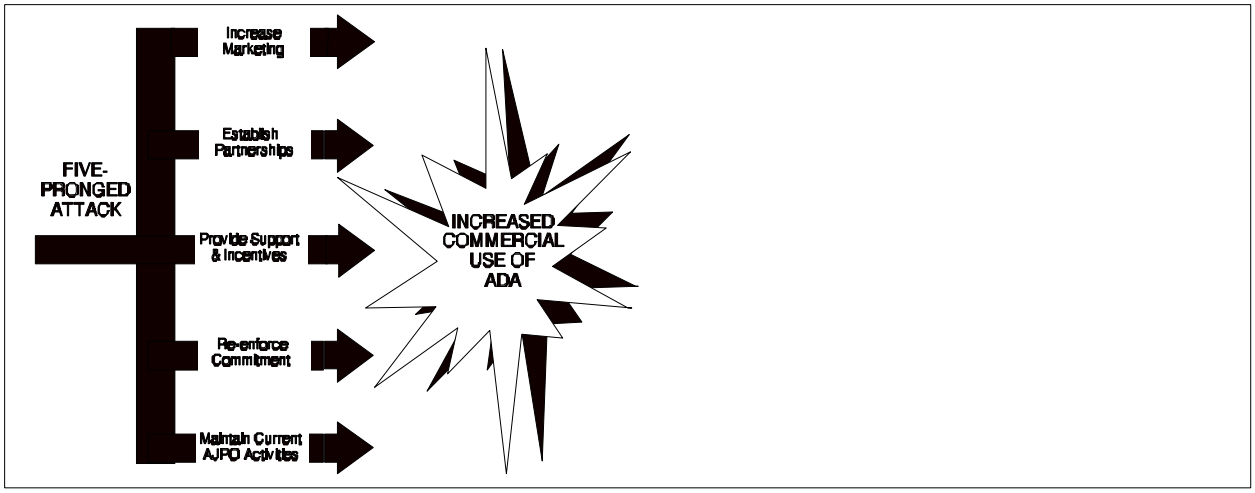
The five thrusts focus DOD efforts and resources where they will be most effective in accomplishing the dual-use objectives. The strategy leverages DOD investments to increase private investment in Ada technology. As shown in Exhibit 2-3, it combines market pushes and market pulls to effect its objectives. The expected result, increased demand for Ada products, creates a ***winning situation for the DOD and its dual-use partners***.



3.0 TACTICAL APPROACH

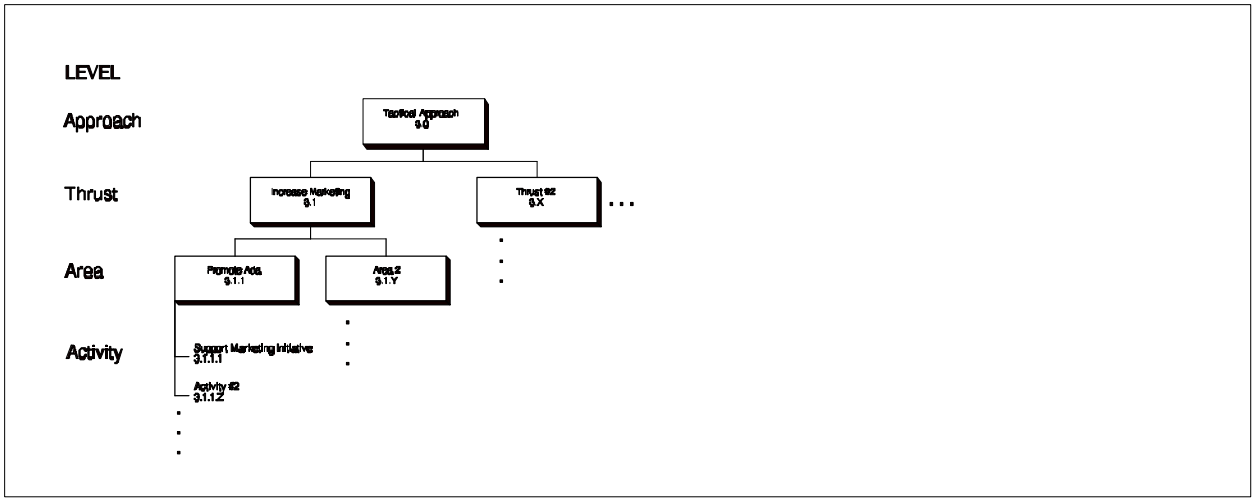
Executing a "push-pull" strategy with a five-pronged attack maximizes program effectiveness.

The goal of the DOD's Ada Dual-Use Program is to increase the use of the Ada language and the software engineering principles it embodies in the defense and commercial sectors. As shown in Exhibit 3-1, the tactical approach executes a ***five-pronged attack****:* increase marketing, establish partnerships, provide support and incentives, re-enforce commitment, and maintain current AJPO activities. These five thrusts were recurring themes of the testimony received at the Ada Dual-Use Workshop held in the fall of 1993.



The following section details each thrust. These thrusts are divided into areas which are further divided into activities. Exhibit 3-2, shown on the next page, illustrates this organization. Each area within a thrust, and its associated activities, are detailed in the paragraphs that follow. This detail includes a description, a list of prioritized tasks with a brief description, the deliverables, and the measures of success.

The thrusts detailed in sections 3.1 through 3.5 are all ***focused efforts*** to increase the use of the Ada language. Each provides the needed ***market push*** or the necessary ***market pull*** to secure DOD's objective. The thrusts outline a 5-year forecast and a 2-year implementation plan. Activities are decomposed into tasks in the 2-year implementation plan in Appendix A to provide greater detail.



3.1 Increase Marketing Thrust

Marketing activities create the market pull for Ada in the commercial and DOD sectors.

One topic reiterated throughout the workshop was the DOD's limited effort to promote and market the Ada language. Workshop participants emphasized the fact that Ada success stories were not effectively communicated to the commercial sector. They expressed concerns that Ada continues to be perceived as a language that is only useful for DOD applications. Participants requested that a business case be developed to support Ada. They wanted to see the "cold, hard facts" supporting Ada and its promises of economy, portability, maintainability, and reliability.

DISA also received feedback suggesting that the DOD's involvement in the development of Ada has impeded its acceptance in the commercial sector. This involvement has amplified the notion

that Ada only applies to the DOD domain. Consequently, it was emphasized that the marketing of Ada not be viewed solely as a DOD effort, but that both hardware and software vendors also be involved in the marketing campaign aimed at changing Ada's image in the commercial sector.

Presented below is a marketing strategy that addresses the major concerns of the workshop participants and supports the vision and goals of DISA. The strategy requires that the AJPO provide leadership and support to the marketing efforts of an independent, vendor-supported Ada trade association. The goal of this thrust is to initiate activity that changes the image of Ada to one of commercial success. The AJPO's involvement in the marketing of Ada will last for two years, after which full responsibility for the campaign will be shifted to the Ada trade association. An aggressive promotion/marketing campaign is essential in creating a successful image for Ada. The marketing activities outlined in the following sections will provide the required DOD support to create the ***market pull*** needed for Ada to reach its dual-use objective.

A work breakdown structure (WBS) and high-level Gantt chart for the **Increase Marketing thrust** of the Dual-Use Program Plan can be found in sections 4 and 5, respectively. The marketing strategy described herein is intended to build upon current marketing initiatives already underway as part of the AJPO's FY94 efforts. The ***Promote Ada*** area focuses on providing leadership and support to the Ada trade association and also addresses activities that will be critical to the successful launch of Ada 9X during FY95.

Table 3-1 provides a summary of activities in this area. This table displays the measures of success and deliverables associated with each activity. A more detailed description of each activity is provided in the paragraphs that follow.

Activity	Measure Of Success	Deliverables
Support Marketing Initiative	Targets of opportunity are identified in the commercial sector within 6 months Ada2 s market share increases by 10% in the first year and 20% in the second Marketing responsibilities and functions fully transition to an Ada trade association within two years AdaIC inquiries, from non-DOD personnel, increase by 100% a year CEOs of targeted Fortune 500 companies receive copies of marketing videos	Market survey report List of targeted commercial markets Promotional materials Advertisements Marketing videos Market reports (penetration status)

	50% of the companies receiving marketing videos respond for more information about Ada	

Table 3-1. Increase Marketing Activity Summary

Support Ada Promotion	Evidence pertinent to commercial requirements that supports Ada2 s benefits over competitor software engineering technology (e.g. the Business Case) is published within three months of the marketing survey CEOs of targeted Fortune 500 companies receive copies of the business case for Ada 50% of the companies receiving the business case for Ada respond for more information about Ada The Ada Business Case is presented at one non-Ada related conference within 6 months of its completion The benefits of Ada are presented at two non-Ada related conferences this year and four conferences next year Articles illustrating the benefits of Ada are published in two non-Ada related trade magazines this year and four magazines next year	Benchmark data Business case Empirical database Success stories

Table 3-1. Increase Marketing Activity Summary (cont'd)

3.1.1 Promote Ada Area

The ***Promote Ada*** area consists of the AJPO providing leadership and support for marketing activities aimed at increasing commercial awareness of the benefits of Ada. These activities ***build upon Ada's numerous successes*** in the DOD and commercial sectors and use these successes to assist an Ada trade association in mounting a campaign to change Ada's image in the commercial sector.

Ada offers significant advantages over other programming languages. The features of Ada, including the software engineering principles that they embody, have been shown to result in lower costs, higher programmer productivity, reduced error rates, and enhanced maintainability.1 The Ada language is completely standardized and open systems compliant. It produces software systems that are highly modular, portable, reusable, and reliable. Despite these benefits, however, Ada has not enjoyed widespread popularity outside of the DOD.

The image of Ada throughout private industry has suffered due to a number of misconceptions. Ada is commonly thought of as a large, complex language that applies only to the DOD domain. While it is a rich language with numerous features, Ada has successfully been used to develop over 100 commercial applications. These success stories have not been effectively communicated. As long as misunderstandings like these persist, Ada will not penetrate the commercial sector. The image of Ada must be changed to accurately reflect its benefits. After a change in the general perceptions regarding Ada is accomplished, its use in non-DOD applications will increase.

The increased usage of Ada promises benefits to the DOD and to private industry. The DOD will realize cost savings in the development of its software systems and in the development of Ada support tools. Private industry will enjoy the productivity, reliability, and maintainability that software developed in Ada can offer. A marketing and promotion campaign is necessary to overcome the negative perceptions of Ada and to publicize its successes so that the DOD and private industry move together to increase its commercial use.

As the promotion/marketing campaign for the Ada dual-use effort rolls out, supporting information must be available to substantiate the claims being made regarding Ada's benefits. These benefits must be expressed in terms that are easily understood by both business and technical personnel from private industry. The benefits must be relevant and substantiated to convince private industry that Ada is superior to other language technologies and applicable to their needs. "Hard data" is needed to substantiate the business case along with examples which show how others have succeeded in gaining a competitive advantage using Ada.

The marketing campaign will generate interest in Ada and promotional materials will be used to address the inquiries that result. A business case for Ada will also be prepared that details its benefits in terms of cost, productivity and quality. In addition, Ada forums will be held to address general inquiries regarding Ada and its successes. These forums will also provide technical personnel from private industry the opportunity to more closely examine Ada technology and features.

3.1.1.1 Support Marketing Initiative

The ***Support Marketing Initiative*** activity will be conducted by the AJPO in cooperation with an Ada trade association. It will establish the approach for promoting Ada's dual-use. A marketing strategy, based on market survey results, will be developed and maintained. The resulting campaign mounted by the Ada trade association and its members will change the image

and broaden the appeal for Ada within both the defense and commercial sectors. The goal of the campaign is also to ***create the market pull*** needed to convince commercial vendors that there is a market outside of the DOD for Ada products.

5-Year Plan (Support Marketing Initiative) :

The AJPO will be successful in its marketing campaign and will be able to phase out its involvement after a two-year period.

2-Year Plan (Support Marketing Initiative):

The Support Marketing Initiative activity consists of two tasks: ***Conduct Market Survey*** and ***Conduct Image Change Campaign***. A detailed description of these tasks can be found in Appendix A.

> The ***Conduct Market Survey*** task identifies the barriers, the competition, and the targets of opportunity for Ada commercialization. The primary goal of this market survey is to identify where and when resources should be allocated in the effort to increase the use of Ada. This survey will be conducted by a credible marketing firm using focus groups and other proven marketing techniques to pinpoint targets of opportunity.
>
> The ***Conduct Image Change Campaign*** task expands on the current efforts of the AJPO to create promotional material which enforces the perception that ***Ada is a winner***. The campaign will use various media to communicate the message (e.g., videos, diskettes, advertisements, games), targeting specific audiences with different promotional techniques. The message conveyed by this campaign will enforce the notion that Ada is the object-oriented solution of choice for high-quality and safety-critical software systems. The AJPO will provide leadership and support to the Ada trade association in the execution of this campaign.

Table 3-2, provides the priority assigned to each task in this activity.

Task Name	Priority
Conduct Market Survey	Critical
Conduct Image Change Campaign	Critical

Table 3-2. Support Marketing Initiative Task Priorities

3.1.1.2 Support Ada Promotion

The AJPO must effectively communicate the successes of existing Ada projects to private industry to complement the marketing activities that will be conducted by the Ada trade

association. These successes must be detailed in terms that are relevant to commercial firms and must be compiled and conveyed in a coherent format. Hard data on cost, productivity, and quality should be presented to demonstrate the benefits of the Ada language over other languages. The collection and compilation of this business case data should be an on-going effort to sustain the marketing effort. The business case metrics provide the essential element of ***building on Ada's success*** and support the ***claims of its advantages***. As a part of this effort, the AJPO will develop a repository for this data that provides easy and flexible access to the statistics and metrics that are captured. This will enable AJPO to tailor its message to particular audiences within the targets of opportunity identified in the market survey.

For Ada to be successful in the commercial sector, the marketing campaign must penetrate the barriers of private industry and change the existing perceptions of Ada. The final activity of the marketing initiative ensures that the DOD is effectively communicating its Ada message into the commercial sector. Teleconferencing, bulletin boards, executive roundtables and seminars are all effective means of communicating the benefits of Ada to audiences outside of the DOD. These efforts comprise a mass media program aimed at communicating Ada's successes and benefits into the commercial and academic sectors. Of particular interest are forums and audiences in which Ada has not been introduced or well-publicized.

The objective of this activity is to complement the efforts of the Ada trade association in the marketing of Ada. Statistics regarding Ada's successes in the DOD will be compiled and communicated through various forums to strengthen the message conveyed by the marketing campaign.

5-Year Plan (Support Ada Promotion):

The AJPO will be successful in its marketing campaign and will be able to phase out of its involvement in the marketing after a two-year period.

2-Year Plan (Support Ada Promotion):

The initial plan for the Support Ada Promotion activity is described below. There are two tasks associated with this activity: ***Develop Ada Business Case*** and ***Disseminate the Ada Message*** These tasks are detailed in Appendix A.

The ***Develop Ada Business Case*** task captures the cost, productivity measurements, and quality data needed to substantiate Ada's benefits to commercial decision-makers. As the data is collected, it will be published and distributed along with lessons learned and success stories. This plan capitalizes on U.S. Air Force efforts to build a national data repository. It is proactive and aimed at getting managers the information they need to make informed decisions. The task also develops the empirical database that will retain relevant data. The AJPO will populate this database with the benchmarking metrics so that the information can be easily retrieved for reporting purposes and business case development.

The ***Disseminate the Ada Message*** task involves the distribution of business and technical information regarding Ada through several vehicles and forums. Its purpose is to publish and present success stories and substantiated facts regarding Ada and its capabilities to the general market, specific trade and academic communities, local governments, high schools, colleges, and small businesses through a bulletin board that will be established. This bulletin board will contain news items and general information regarding Ada's successes. The international community will also targeted through an annual "State of Ada Message" that will be broadcast via a world-wide teleconference and the AJPO's annual dual-use conference.

Table 3-3, provides the priority assigned to each task in this activity.

Task Name	Priority
Develop Ada Business Case	Critical
Disseminate the Ada Message	Critical

Table 3-3. Support Ada Promotion Task Priorities

The marketing strategy exploits all available opportunities in the market by establishing the appropriate infrastructure and employing promotional techniques. The widespread, but focused, campaign will target a number of critical audiences and relate information about Ada to them in a manner that is tailored to their particular interests. The marketing thrust **builds on the successes of Ada** while promoting the additional advantages of Ada 9X. A market pull for Ada technology will be created by enforcing the perception that Ada is a winning technology that is applicable to commercial applications.

3.2 Establish Partnerships Thrust

Increase outreach through the joint funding of dual-use technologies.

To assist in creating the ***market pull*** for Ada, the program plan encourages and facilitates the establishment of ***dual-use partnerships*** that create DOD jointly-funded programs with industry, universities, and other Government agencies. With the streamlining of its budget, the DOD must find alternative and creative means to actualize its objectives for this program. The DOD can act as a venture capitalist providing seed funding needed to develop dual-use investments. The partnerships that result will provide a rare opportunity for the DOD and its dual-use partners to work together and develop products that spawn commercialization. Since each player has invested in the project and product, each player has a vested interest in making their investments yield positive results.

The AJPO cannot predict with certainty what partnerships will be needed, let alone awarded, in the future. The AJPO can, however, identify goals and measures of success for the partners program. The AJPO can then rate and rank each proposed partnership according to established

evaluation criteria including degree of cost-sharing and potential for commercial use. The partnership will be awarded to the highest ranking proposals. Reference section 4.0, Management Approach, to gain more insight into how DISA plans to oversee partnerships.

A WBS and high-level Gantt chart for the Establish Partnerships thrust of the Dual-Use Program Plan can be found in sections 4 and 5, respectively. The ***Establish Partnerships*** thrust currently consists of one area, ***Initiate Partners Program***. This area focuses on creating partnerships that are attractive alternatives to other investment opportunities with universities, industries, and other Government agencies.

Table 3-4, provides a summary of the activities in this area. This table displays the measures of success and deliverables associated with each of the activities. This plan provides a more detailed description of each activity in the following sections.

Activity	Measure Of Success	Deliverables
Institute Partnerships with Universities Program	More than 20 responses are received for each university partnership BAA An increase in Ada courseware and teaching tools by 10% in the first year, and 25% in the following year An increase in the number of universities offering an Ada course by 10% in the first year, and 25% in the following year 25% of universities currently offering an Ada course adopt Ada as their standard language for teaching software engineering within two years	Curriculum Courseware Teaching artifacts Monographs CD-ROMs Other joint partnership products
Institute Partnerships with Industry Program	More than 10 responses are received for each Industry partnership BAA The creation of one Ada competitor (competitive in price, features, and development platforms) in the PC market in the next two years.	Reusable software components PC-based development kit Visual programming environment Commercial AdaSAGE Proofs of concept Other joint partnership products

Table 3-4. Establish Partnerships Activity Summary

	The creation of one Ada competitor (competitive in price, features, and development platforms) in the workstation market in the next two years. Prices for Ada compilers, tools, and programming environments will drop to a level that is competitive to other language systems An increase in the Ada marketshare by 10% in the first year and 20% in the second year	
Institute Partnerships with Government Program	More than 10 responses are received for each Government partnership The creation of one civil agency partner per year for each year in the program An increase in the Government Ada marketshare by 10% in the first year and 20% in the second year	Joint product Ada research & development results Reusable software components Proofs of concept Standardized bindings Other joint partnership products

Table 3-4. Establish Partnerships Activity Summary (cont'd)

3.2.1 Initiate Partners Program Area

By initiating a partners' program, the DOD reaches out to other leading organizations to develop dual-use products and technology. The program identifies three activities for the DOD to pursue: ***Institute Partnerships with Universities Program***, ***Institute Partnerships with Industry Program***, and ***Institute Partnerships with Government Program***. Each of these activities provides enticing partnerships to gain stakeholder buy-in. The details for these activities follow.

3.2.1.1 Institute Partnerships with Universities Program

Universities are the breeding ground for tomorrow's leaders in industry. Pascal is the predominant teaching language with Ada, C, and C++ current contenders. Entering into ***dual-use partnerships*** with universities will give Ada the chance to penetrate university curriculums, and research activities. These partnerships allow professors and graduate students a chance to work with leading edge technology applicable to a broad spectrum of today's industry. Their

excitement and support of this technology will spread to the undergraduates and eventually, as students graduate, to the commercial sector. The partnerships will not only provide a pool of qualified Ada software engineers, but also a significant number of reusable software components, courseware, and teaching artifacts.

5-Year Plan (Institute Partnerships with Universities Program):

The DOD cannot forecast what partnerships will be required or desired over the next five years. However, it can put processes in place to develop partnerships with universities that align with program goals and objectives. Partnerships can be made to stimulate more universities and colleges to use Ada in their research and to teach it in their undergraduate and graduate programs.

2-Year Plan (Institute Partnerships with Universities Program):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of the partnering activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Form AJPO/University/Historically Black Colleges and Universities Partnerships*** task provides professors from teaching and research universities, HBCUs, and other minority institutions with incentives (e.g., grants, equipment, support) to use Ada. The product of this partnership will be a movement to Ada as the language of choice within institutions of higher education.

The ***Form AJPO/SEI Partnerships*** task enlists the SEI's support of Ada within the education and several other focus areas within the plan. This partnership will produce a variety of products that software managers and engineers can use in practice including courseware for use in teaching program managers and contracting officers their legal responsibilities relative to Ada.

The ***Institute Surplus PC Program*** task supplies high schools, junior colleges, and entry-level college programs with Ada courseware, surplus PCs, and free Ada compilers. The purpose of this program is to proliferate software engineering in Ada throughout the educational environment. By arming students with knowledge, they will be able to more effectively compete within the university environment.

The ***Publish Monographs*** task supports the quick and inexpensive publication of Ada materials for use in the university environment (both teaching and research). This task will produce pamphlets and papers that support the teaching of Ada and the software engineering principles that it embodies.

The ***Institute Good Idea Program*** task encourages innovation in academia and the DOD. This task will fund ideas that provide a potential return on investment that can be pursued in a proof of concept mode. Once proven, projects may evolve to quickly expand on the concept and develop products that

increase the academic use of Ada.

Table 3-5, provides the priority assigned to each task in this activity.

Task Name	Priority
Form AJPO/University/HBCU Partnerships	Essential
Form AJPO/SEI Partnerships	Critical
Institute Surplus PC Program	Funded
Publish Monographs	Essential
Institute Good Idea Program	Desired

Table 3-5. Institute Partnerships with Universities Task Priorities

3.2.1.2 Institute Partnerships with Industry Program

This partnering program provides participants with something of value in return for their investments. In essence, the DOD is taking on the role of investment broker. By providing their partners with seed capital, the DOD gets something it needs developed more quickly and at a lower price. In return, the partner gets funds that allows them to capitalize on DOD's investments to develop needed products. Both sides win as they reap the benefits of the partnership.

5-Year Plan (Institute Partnerships with Industry Program):

The DOD cannot forecast what partnerships it will require or desire over the next five years. However, it can put a process in place to develop partnerships with industry that align with program goals and objectives. This process takes the results of market surveys and uses them to identify partnering opportunities and market needs. Based upon this analysis, products can be developed to satisfy consumer demand. The AJPO will develop partnerships to bring the necessary products to market.

2-Year Plan (Institute Partnerships with Industry Program):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of the partnering activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Form AJPO/Automobile Manufacturing System Partnerships*** task develops products needed to successfully introduce Ada into manufacturing and active automobile control systems. Because of the similarity shared with DOD systems, such systems are natural targets for Ada. Both DOD's and industry's interests can be served by building reusable software processes and products for robotics, control systems, and advanced manufacturing system applications.

The ***Form AJPO/Financial Services Partnerships*** task develops

products needed to successfully use Ada in systems moving from COBOL on mainframes to a distributed, client-server environment. Because of their criticality and the need to control access, such systems are natural candidates for Ada. Again, both DOD and industry benefit from the partnership. Products could include standards, processes, and/or reusable software products.

The ***Form AJPO/Medical Instrumentation Partnerships*** task develops products needed to successfully use Ada in the medical instrumentation area. Both DOD's and industry's needs for high reliability products must be satisfied. Products could include processes and reusable software products.

The ***Form AJPO/COTS Software Partnerships*** task provides commercial software houses with incentives to develop Ada products for the mass market and for emerging multi-media markets.

The ***Form AJPO/AdaSAGE Partnerships*** task makes AdaSAGE source code available to companies that can use it to create commercial products. AdaSAGE is a generator that enables users to quickly build user interfaces and databases used to drive data-driven applications.

The ***Institute Good Idea Program*** task encourages innovation in industry and the DOD. This task will fund ideas that provide return on investment the can be pursued in a proof of concept mode. Once proven, projects may evolve to quickly expand on the concept and develop products that increase the commercial use of Ada.

Table 3-6, provides the priority assigned to each task in this activity.

Task Name	Priority
Form AJPO/Automobile Manufacturing System Partnerships	Essential
Form AJPO/Financial Services System Partnerships	Essential
Form AJPO/Medical Instrumentation System Partnerships	Essential
Form AJPO/COTS Software Partnerships	Critical
Form AJPO/AdaSAGE Partnerships	Funded
Institute Good Idea Program	Desired

Table 3-6. Institute Partnerships with Industry Task Priorities

3.2.1.3 Institute Partnerships with Government Program

The final type of partnerships that the DOD will target is with other Government agencies. There are many opportunities for the DOD to partner with other Government organizations and agencies to stimulate their use of Ada for in-house and contracted developments. Such use will

enable the Government to lever its buying power to further stimulate growth of the Ada market. However, sponsorships may be needed to create the ***pull*** required to overcome the hesitation to switch to Ada. There is no better promotion for Ada and the DOD than to show that Ada has applicability in other Government agencies.

5-Year Plan (Institute Partnerships with Government Program):

The DOD cannot forecast what partnerships will be required or desired over the next 5 years. However, it can put a process in place to develop partnerships with other Government agencies that align with program goals and objectives. This mechanism takes the results of the annual Ada infrastructure assessment and uses them to target Government agencies for partnership.

2-Year Plan (Institute Partnerships with Government Program):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Form AJPO/FBI Joint Partnerships*** tasks the AJPO, the FBI, and several police departments to develop a fingerprint identification system in Ada using interoperable reuse repositories. This partnership will provide a proof of concept for the use of Ada within the FBI. It will also develop infrastructure building blocks in Ada that are useful to the DOD in its migration systems.

The ***Form AJPO/NIST Joint Partnerships*** task provides the means to take advantage of dual-use joint project funding, through the AJPO and NIST. This partnership will promote the use of Ada in "factory of the future" applications which have potential benefits both to DOD and the manufacturing sector.

The ***Form Other Agency Partnerships*** task provides a vehicle for other agencies to form partnerships with the DOD. Such partnerships would yield positive returns for both parties and would substantiate the mutually beneficial environment of the partnership program.

The ***Institute Good Idea Program*** task encourages innovation within the DOD. This task will fund ideas that provide a potential return on investment that can be pursued in a proof of concept mode. Once proven, projects may evolve to quickly expand on the concept and develop products that increase the use of Ada within the Government and/or commercial sectors.

Table 3-7, provides the priority assigned to each task in this activity.

Task Name	Priority
Form AJPO/FBI Partnerships	Necessary
Form AJPO/NIST Partnerships	Essential

Form Partnerships with Other Agencies	Necessary
Institute Good Idea Program	Desired

Table 3-7. Institute Partnerships with Government Task Priorities

3.3 Provide Support and Incentives Thrust

Facilitate the use of Ada by making tools, bindings, and trained personnel readily available.

To help create the ***market pull*** for Ada, the program plan ***provides for support and incentives*** that facilitate the use of Ada in a production environment. This focus will make Ada more attractive by providing needed tools, bindings, and support necessary to introduce Ada into the commercial marketplace. Such products will provide appeal for Ada in the non-DOD market place. Provided in the following paragraphs are the details of the ***Provide Support and Incentives*** thrust.

By providing the essential tools and bindings, those making a language choice will be convinced to select Ada because it will come equipped with a rich and flexible application development environment. The bindings and tools will permit the language to be exploited, thus creating a ***market pull*** for Ada. They will open up the language by permitting it to access proven building blocks written in other languages and a wide range of system software utilities.

By leveraging its investments, the DOD is able to reduce its costs and acquire needed products in less time than it would take to produce them otherwise. The stakeholders are able to "piggy-back" on the DOD funding to increase their competitive advantage.

A WBS and high-level Gantt chart for the Provide Support and Incentives thrust of the Dual-Use Program Plan can be found in sections 4 and 5, respectively. The ***Increase Ada Support*** area focuses on Ada co-existing in the commercial world with other languages, not competing to replace them. In order to survive in the commercial world, a rich set of tools must exist to support Ada. The ***Develop Bindings*** and ***Develop Tools/Environment*** activities are designed to develop the necessary tools.

Table 3-8, provides a summary of these activities. This table displays the measures of success and deliverables associated with each of the activities. A more detailed description of each is provided in the following sections.

Activity	Measure Of Success	Deliverables
Develop Bindings	Provide two high demand bindings (e.g. POSIX) within 9 months after the release of the Ada 9X standard. Both bindings will be used on a migration system within 2 months of their completion	Bindings plan Bindings generator Bindings reports Technology demonstrations Proofs of concept Reusable software

		components
	Provide two other high demand bindings within 18 months after the release of the Ada 9X standard. Both bindings are used on a migration system within 2 months of their completion	Lessons learned
	Confirmation that high demand bindings have been used on 5 migration systems (e.g. GCCS) within 1 year of the completion of the bindings mentioned above	
	Ada 9X compilers come complete with a standard set of high-demand bindings	

Table 3-8. Provide Support and Incentives Activity Summary

Develop Tools/Environments	The creation of two Ada competitors (competitive in price, features, and development platforms) in the programmer toolset market in the next two years.	Tool white paper Tools plan Tool set(s) Tools plan Class library(s)
	Ability to acquire compiler tools at a cost comparable to alternative commercial packages	Compiler upgrade procurement Proofs of concept Lessons learned reports
	Ada 9X compiler prices are available at a level comparable to other languages	
	Ada 9X compilers come complete with a set of standard class libraries	

Table 3-8. Provide Support and Incentives Activity Summary (cont'd)

3.3.1 Increase Ada Support Area

Ada must stand on its own and co-exist with other language technology. In the past, Ada proponents have taken the strategy of confrontation; the approach needs to be changed to one of cooperation. The ***Increase Ada Support*** area provides those software components (e.g. tools,

bindings, compilers, environments) needed to make Ada extremely attractive to potential users. Simply having a good language is not enough. The language must be provided with a powerful development environment (e.g., debuggers, CASE tools) and must interface or ***bind*** with other software used to produce applications (e.g., operating systems, generators). The DOD's strategy is to support the standards (e.g., SQL) and infrastructure that the tools are based on, instead of the individual tools themselves.

The ***Increase Ada Support*** area is broken into two activities: ***Develop Bindings*** and ***Develop Tools/Environments***. The binding activity focuses on developing required bindings, prototyping potential future bindings, and placing bindings into reuse libraries. The tools/environments activity focuses on developing Ada tools/environments that make Ada the clear choice to those looking for a rich and powerful application development environment.

3.3.1.1 Develop Bindings

The ***Develop Bindings*** activity focuses on identifying and developing required bindings for Ada 9X, identifying and prototyping potential future bindings, and placing bindings into reuse libraries. Bindings will be selected that are required to make Ada 9X the clear choice for legacy systems that are being re-engineered. Focusing on the needs of critical systems, such as legacy systems, forces selection from a wide set of alternatives.

5-Year Plan (Develop Bindings):

As technology advances, so will the need to interface with it in the future. This activity provides the DOD with the means to tap this technology through bindings and tools (i.e., provide the technology transfer mechanism). The AJPO will continue to investigate, develop, and place bindings and tools into reusable libraries as new technologies mature and become available for use.

2-Year Plan (Develop Bindings):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Develop Bindings Plan*** task defines a plan of attack that guides conduct of this activity. The bindings plan will identify what bindings are needed to make Ada attractive to potential users. The developers of the plan will determine what bindings are required to allow Ada 9X to work within both a COTS and a legacy environment.

The ***Update Bindings Plan*** task assesses the progress made to date by the other Develop Bindings activity tasks. It will ensure that the bindings being developed continue to be in alignment with DOD needs and will modify the bindings plan as required.

The ***Develop Bindings Generator*** task develops a bindings generator tool that will be used to generate Ada bindings from existing bindings specified in C. These bindings will allow Ada products to interface with non-Ada COTS products.

The ***Develop Required Bindings*** task develops those bindings identified in the bindings plan. The bindings developed will make Ada attractive on both workstations and PCs. The bindings produced will be aimed at client-server systems and legacy challenges.

The ***Prototype Next Generation Bindings*** task addresses the future bindings by examining possible bindings to the Common Object Request Broker Architecture (CORBA), Object-Oriented Database Management Systems (OODBMSs), and Object Linking and Embedding (OLE). This task will produce technology demonstrations and align DOD efforts to standards of the future.

The ***Populate Reuse Library with Bindings*** task drops bindings into a reuse library, describes them, certifies them, and makes them available to the public at large. These reusable bindings are the product of this task.

The ***Prototype Wrapper Technology*** task explores the possibilities of using Ada as a meta-language to integrate packages together via wrappers. This task will produce technology demonstrations.

These tasks form a strategy that will enable Ada to effectively compete with other software languages and tools.

Table 3-9, provides the priority assigned to each task in this activity.

Task Name	Priority
Develop Bindings Plan	Funded
Update Bindings Plan	Essential
Develop Bindings Generator	Funded
Develop Required Bindings	Critical
Prototype Next Generation Bindings	Desired
Populate Reuse Library with Bindings	Essential
Prototype Wrapper Technology	Necessary

Table 3-9. Develop Bindings Task Priorities

3.3.1.2 Develop Tools/Environments

Although many Ada tools and environments exist, they are currently priced higher than those available for other languages. The DOD needs to use its purchasing power to bring down the entry prices so that tools can create a draw for prospective commercial Ada users. It also needs

to help make the transition to Ada 9X affordable for firms that have already invested in Ada technology. Below is a strategy to help provide low-priced tools and environments to consumers inside and outside of the DOD.

5-Year Plan (Develop Tools/Environments):

In order to penetrate new markets, there will be a constant need for Ada tools and environments, as well as, COTS products. The DOD can provide support and incentives to help subsidize the development of needed Ada tools and environments by using DOD purchasing power and Ada dual-use partnerships. The DOD can transition such support to the vendors, who will focus their attention on penetrating new markets once their products are available.

2-Year Plan (Develop Tools/Environments):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Finalize ASIS*** task upgrades the Ada Semantic Interface Specification (ASIS) for Ada 9X and encourages CASE tool vendors to use it as a standard once it is completed. ASIS permits logical integration of tools and repositories.

The ***Fund Compiler Upgrades*** task allows the DOD to position itself for the expected onslaught of requests for Ada 9X compiler upgrades. This task will provide a contract vehicle that takes advantage of DOD's purchasing power to acquire compilers at an affordable price.

The ***Build Class Libraries*** task is designed to develop standard Ada 9X support packages that meet developers' needs. These class libraries play an integral role in the transition to Ada 9X. As mentioned earlier, by providing the proper tools and support, Ada 9X will become the language of choice.

The ***Build Programmer Toolset*** task develops a rich suite of lower-CASE tools providing support to Ada 9X developers. The suite will include library management facilities, source-code formatters, debuggers, and other tools providing similar support. This toolset will play an integral role in the transition to Ada 9X. By providing the proper tools and support, Ada 9X will become the programming language of choice.

Table 3-10, provides the priority assigned to each task in this activity.

Task Name	Priority
Finalize ASIS	Necessary
Fund Compiler Upgrades	Funded
Build Class Libraries	Essential

Build Programmer Toolset	Critical

Table 3-10. Develop Tools/Environment Task Priorities

3.4 Re-enforce Commitment Thrust

Provide implementation guidance and training for the Ada mandate.

The DOD must reaffirm its commitment to the Ada mandate. The Ada language (MIL-STD-1815A) was defined to be the common, machine-independent programming language for DOD-wide use in mission-critical computer applications. The DOD developed Ada to control the proliferation of programming languages, establish a standard programming language for the DOD, and reduce DOD's cost to maintain mission-critical computer software.

Public Law 102-396, section 9070 of the DOD Appropriations Act for FY93, requires that **"Where cost effective, all Department of Defense software shall be written in the programming language Ada. . ."** The DOD has developed policies and standards for using Ada, including DOD Instruction 5000.2 and DOD Directive 3405.1. The DOD needs to consistently interpret the 3405.1 directive by providing consistent interpretation guidance and direction to DOD components.

The driving reasons to standardize new development using a single high-level language remain valid. Specifically, the quality of the resulting software will be higher. Ada is not merely a programming language; it is a vehicle for new software practices and methods for specification, program structuring, development and maintenance. Its features support:

Portability
Modularity
Reusability
Reliability
Maintainability

Implementation guidance must be provided to DOD components to ensure that the DOD is positioned to take full advantage of Ada's benefits. The scope and intent of the mandate must be made clear to all DOD decision-makers. There must be consistent interpretation of the Ada policy across all MAISRC, non-MAISRC, and R&D programs. The **Strengthen Ada Mandate** area focuses on activities that the AJPO can undertake to ensure that these goals are achieved.

Table 3-11, provides a summary of the activities that the AJPO will initiate to educate DOD personnel on the Ada mandate.

Activity	Measures Of Success	Deliverables
Provide	DOD organizations use	Implementation guidance

Implementation Guidance	implementation guidance to consistently interpret the Ada mandate.	handbook Handbook pilot report
Provide Training	20% of DOD contracting and acquisition personnel, and 20% of DOD PEOs/PMs are trained in the scope and intent of the Ada mandate within two years.	Training program Pilot program results report

Table 3-11. Re-Enforce Commitment Activity Summary

3.4.1 Strengthen Ada Mandate Area

Congress recognized that **Ada is the language of choice** for DOD software application development and mandated its use over the application life cycle. To use an alternative programming language, a waiver must first be obtained. The waiver must document that the alternative approach will be significantly more cost-effective over the entire system's life cycle than using Ada. All DOD software-intensive systems are subject to these requirements.

The rationale used to adopt Ada is still relevant and there are no compelling reasons to remove the mandate. On the contrary, the meaning of the mandate must be better communicated so that the DOD can more fully realize the benefits of using Ada. In order to do so, the DOD must have an infrastructure in place to support and guide organizations in the transition to Ada. It is not sufficient to merely prepare and publish Ada policy. To deploy this policy, the DOD must also make the appropriate investments in implementation guidance and training. ***Strengthen Ada Mandate*** is composed of two activities: ***Provide Implementation Guidance*** and ***Provide Training***. They are described in detail in the following sections.

3.4.1.1 Provide Implementation Guidance

The effectiveness of the mandate is currently suffering due to inconsistent interpretation by different organizations in the DOD. The phrase "where cost-effective" has caused confusion among many DOD components. The DOD must offer consistent interpretations of its Ada policy, or core technology support for Ada will erode. Guidance must be provided to DOD components on the scope and intent of the Ada mandate. The policy must be clearly explained and elaborated so that DOD personnel have the basis for complying with the law.

5-Year Plan (Provide Implementation Guidance):

As misunderstandings regarding the mandate are identified, they must be clarified and uniform guidance must be published. The handbook will be updated based on piloted results and on any changes that are made to the mandate.

2-Year Plan (Provide Implementation Guidance):

The 2-year plan for this activity consists of two tasks: ***Develop Handbook*** and ***Conduct Handbook Pilot***. A detailed description of these tasks can be found in Appendix A.

The ***Develop Handbook*** task develops a handbook to provide guidance for military technical and management personnel. The handbook will focus on the acquisition process and will provide PEOs/PMs/PCOs with guidance on how to incorporate Ada into solicitations, source selection evaluations, tailoring, and performance management systems. The handbook is critical because it provides military personnel moving to Ada 9X and MIL-STD-498 guidance in the handling of acquisition issues.

The ***Conduct Handbook Pilot*** task demonstrates that the guidance provided in the handbook works in practice. Based upon results of the pilot, the handbook will be modified to improve its effectiveness.

These tasks strengthen the Ada mandate and assist the DOD in re-enforcing its commitment to Ada. Table 3-12, provides the priority assigned to each task in this activity.

Task Name	Priority
Develop Handbook	Necessary
Conduct Handbook Pilot	Necessary

Table 3-12. Provide Implementation Guidance Task Priorities

3.4.1.2 Provide Training

Infrastructure, which includes personnel and training, is the critical component in making the Ada policy a success. If the people believe in the merits of the policy, they will adhere to it. Provide the people with the right training, support, and tools and they will be advocates who will advance the mandate because they will be able to achieve the benefits that software engineering in Ada provides them.

5-Year Plan (Provide Training):

The Ada mandate training process must be evaluated annually to provide for continuous process improvement. Deficiencies in the process and in the effectiveness of the training programs must be reviewed and tuned to optimize the success of the program. Courses must be continuously introduced into DOD schools to inform decision-makers of the reasons why Ada is a wise choice.

2-Year Plan (Provide Training):

The 2-Year plan for this activity consists of two tasks: ***Develop Training Program for DOD Professionals*** and ***Conduct Pilot Course Offerings***. A detailed description of these tasks can be found in Appendix A.

The ***Develop Training Program for DOD Professionals*** task provides the necessary training to inform DOD professionals of Ada policies and directives. Course material will be developed for the staff supporting the decision-maker, program managers, procurement personnel, and other personnel affected by the Ada mandate. These courses will be introduced into the Defense Acquisition University and Defense System Management College curriculums.

The ***Conduct Pilot Course Offerings*** task evaluates the Ada mandate training process to provide for continuous process improvement. The results of the assessment will be captured in a report detailing the areas for process improvement. These results will be used to revamp the training program and make the courses more relevant.

Table 3-13, provides the priority assigned to each task in this activity.

Task Name	Priority
Develop Training Program for DOD Professionals	Necessary
Conduct Pilot Course Offerings	Necessary

Table 3-13. Provide Training Task Priorities

3.5 Maintain Current AJPO Activities Thrust

Solidify the existing client base and assist organizations in the transition to Ada 9X.

To help create the market pull for Ada, the program plan ***maintains those current AJPO activities*** that ***solidify*** the current client support base for Ada and expand its use for other prospective users. The focus of the current program is developing the Ada 9X standard. The emphasis must change in the near term to provide support to those programs in transition. The details of this program are provided in the following paragraphs.

The ***Support Current Ada Programs*** area focuses heavily on Ada 9X and its standardization. By maintaining this focus, the DOD will maintain the current backing Ada and Ada 9X are receiving. The DOD can then ***build on these successes*** to springboard into the new initiatives detailed in sections 3.1 through 3.4.

A WBS and high-level Gantt chart for the Maintain Current AJPO Activities thrust of the Dual-Use Program Plan can be found in sections 4 and 5, respectively. The Support Current Ada Programs area focuses on solidifying the DOD's current support base. The area consist of four activities which are summarized in table 3-14. This table displays the measures of success and deliverables associated with each of the activities. A more detailed description of each activity is provided in the following paragraphs.

Activity	Measures Of Success	Deliverables
Support Core Ada	10% of new or upgraded projects agreeing to use Ada 9X in 1996	Ada 9X standard Ada 9X transition plan ACVC (updates) ALS/N (final version) ACES (update) Information (both in paper and electronic form) Promotional materials GNU compiler
Support ATIP Program	One migration system successfully using Ada to SQL binding within 2 years. 10% of the projects receiving results (e.g., testimonies, success stories) of an ATIP project(s) adopt results	SBIR study reports Proofs of concept Technology demonstration Commercial spinoff products
Support Ada 9X Transition	Ada 9X adoption rate increases annually by 10% One migration system successfully transitioned to Ada 9X by 1998	Ada 9X standard Ada 9X transition plans AdaSAGE enhancements Bindings (currently underway) Ada 9X transition handbook Startup team results
Support AJPO Program Management	N/A	AJPO host support Printing and travel support

Table 3-14. Maintain Current AJPO Activity Summary

3.5.1 Support Current Ada Programs Area

The DOD must solidify the current support base for Ada as it moves forward to gain additional advocates. This area outlines the current Ada programs. These current programs may be similar in nature to many of the programs outlined in sections 3.1 through 3.4.

The ***Support Current Ada Programs*** has four activities: ***Support Core Ada***, ***Support ATIP Program***, ***Support Ada 9X Transition***, and ***Support AJPO Program Management***. Each are detailed in the following sections.

3.5.1.1 Support Core Ada

The Ada Program needs to maintain a consistent level of support for its existing program. The reason for it is simple, this program continues core developments which are the basis of all other initiatives. Without Ada 9X, there will be no future. Without the AdaIC, our marketing thrust

will be fruitless.

5-Year Plan (Support Core Ada):

As the Ada 9X program matures, this activity will transition from a standards development to a standards maintenance activity. The AJPO will enhance developed products as feedback from users is obtained, evaluated, and acted upon. It will also initiate the activity needed to begin the next standards update effort.

2-Year Plan (Support Core Ada):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Finalize Ada 9X*** task focuses on developing the next generation of Ada capabilities. Currently, this task is developing standards, tools (GNU compiler), educational opportunities, and bindings.

The ***Expand AdaIC*** task is an outreach program designed to provide for the dissemination of Ada information (e.g., articles, white papers) to both defense and commercial users.

The ***Update Evaluation and Validation*** task is designed to ensure conformance of Ada compilers to standards, maintain Ada compiler validation capability test suites, evaluate compiler performances through another test set, and assist program managers evaluate compiler and tool functionality and performance.

The ***Develop Educational Environment*** task produces a solid Ada teaching environment including hardware, software, multi-media, and a computer managed training/computer aided instruction (CMT/CAI) subsystem. This environment will be used to attract universities to Ada as the basis for their software engineering curriculum.

These tasks have been funded and were, therefore, not prioritized.

3.5.1.2 Support ATIP Program

The ATIP program accelerates the move to Ada by proving concepts and demonstrating ways to reduce technology transfer times. It aids the DOD in overcoming barriers to Ada adoption by focusing on key technical issues that need to be resolved in a timely fashion. Although the program focuses on military needs, it may develop products that have commercial value.

5-Year Plan (Support ATIP):

The ATIP activity funds applied research that is aimed at meeting military needs. As the Ada 9X program and the program plan matures, the ATIP activity will transfer to the ATIP Partnership (ATIPP) task. This task broadens the scope of the existing ATIP program to address the AJPO's commercialization goals.

2-Year Plan (Support ATIP):

Provided below is a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Support ATIP Projects*** task develops proofs of concept, technology demonstrations, and products of use to military organizations. The projects within this task are focused on accelerating Ada usage by addressing specific technical problems that inhibit use in military systems. This task will be phased out and replaced by the Support ATIPP Projects task.

The ***Support ATIPP Projects*** task develops proofs of concept, technology demonstrations, and commercialized products through partnerships with dual-use partners. The projects within this task are focused on accelerating Ada usage by addressing education, bindings, and technology issues for the full range of academic, industry, and Government stakeholders.

The ***Capitalize on SBIR*** task focuses on stimulating small businesses to propose innovative ways to accelerate increased commercial use of Ada. Again, proofs of concept are developed that can quickly lead to commercial applications via this program.

The ***Develop Ada 9X SAMeDL*** task develops a SQL binding to Ada 9X. The DISA Center for Standards will coordinate the FIPS standardization process for this binding which is essential if Ada is going to be used by migration systems.

The ***Establish University Grant Program*** task focuses on the development of courses and course material needed to teach Ada within a university environment. It is intended to help computer science, business, engineering, information management, and other departments convert to Ada in U.S. colleges and universities..

These tasks have been funded and were, therefore, not prioritized.

3.5.1.3 Support Ada 9X Transition

This activity is intended to provide managers within the Department of Defense with the guidance they need to make a smooth transition from Ada 83 to Ada 9X. The activity will focus on providing tools, guidance and support required to expedite the transition from Ada 83 to Ada

9X and from other languages to Ada.

5-Year Plan (Support Ada 9X Transition):

This activity develops guidelines and planning templates which guide the transition from Ada 83 to Ada 9X and ensure that the insertion goes smoothly.

2-Year Plan (Support Ada 9X Transition):

Provided are a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Develop Ada 9X Transition Handbook*** task develops guidance targeted at program managers that is issue-based and action-oriented. The handbook will provide a plan to complete a successful transition from Ada 83 to Ada 9X.

The ***Develop Ada 9X Transition Plan*** task provides managers templates which lead to a smooth transition to Ada 9X. The planning accomplished in this task will be executed by Startup Teams (see next task) consisting of seasoned professionals who will ensure that the transition occurs quickly and smoothly.

The ***Implement Ada 9X Startup Team*** task supports organizations executing the Ada 9X transition plan. It strives to provide program managers with the qualified and skilled staff support they need to be successful.

The ***Implement Ada 9X Transition Training*** task supports organizations in the transition to Ada 9X. It provides all levels of the organization with the training required to make the transition a success.

These tasks have been funded and were, therefore, not prioritized.

3.5.1.4 Support AJPO Program Management

This activity is to provide the support necessary for the AJPO to manage on-going efforts and address administrative support issues.

5-Year Plan (Support AJPO Program Management):

This activity is focusing on the on-going management and administrative support required to maintain AJPO efforts. Oversight and insight are the products of these activities.

2-Year Plan (Support AJPO Program Management):

Provided are a list of specific tasks, with short descriptions, that fulfill the goals of this activity. For a more detailed description of the tasks, refer to Appendix A.

The ***Support Printing and Travel*** task allocates funds for publishing the quarterly AdaIC Newsletter and for the travel expenses of AJPO personnel.

The ***Provide AJPO Host Support*** task funds support for Sprint phone lines and the E-mail system currently hosted on the Software Engineering Institute's (SEI's) machines. These systems, which are being replaced by an AJPO-resident anonymous FTP-node, allow the AJPO to foster communications across the Ada industry.

These tasks have been funded and were, therefore, not prioritized.

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4.0 MANAGEMENT APPROACH

Manage for optimum results.

4.1 Planning and Control

The well-planned, measurable, and controlled plan of attack maximizes the program's chances of success.

Successful implementation of this program will be accomplished using proven project management techniques. Elements that will contribute to the success of the program include:

A work breakdown structure that outlines the work that must be conducted to accomplish program requirements

A periodic review process that assesses progress and focuses on risk

A task management process for controlling the work at the performer level

MOAs and contractual agreements that spell out responsibilities and make commitments visible

A program organization empowered to get the job done quickly

A budget process that evaluates task progress based upon actual performance

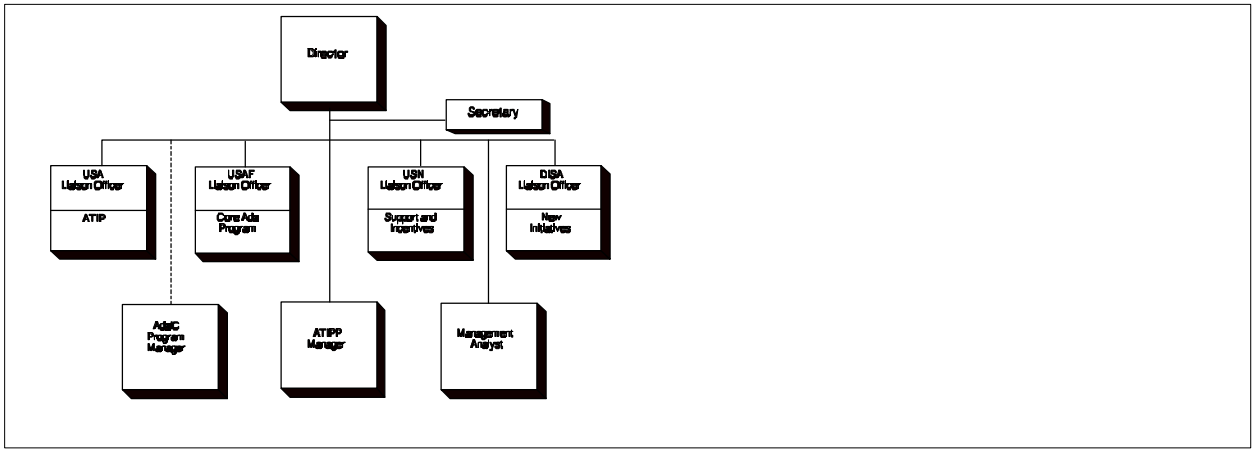
Commitments from key decision makers to make the program a success

4.1.1 Program Organization

An initiative of this magnitude must be managed as a major program within the DOD. The AJPO will have primary responsibility for the execution/management of this program and for the management of activities and tasks that fall within its scope. The AJPO's responsibilities include:

Planning, budgeting, and scheduling authority
Reviewing technical, cost, and schedule performance
Providing technical and contractual direction
Maintaining oversight and providing direction
Integrating and coordinating activities
Reporting progress and managing risk
Maintaining quality standards and control
Updating program plans as required
Assuring coordination with other DOD technical efforts

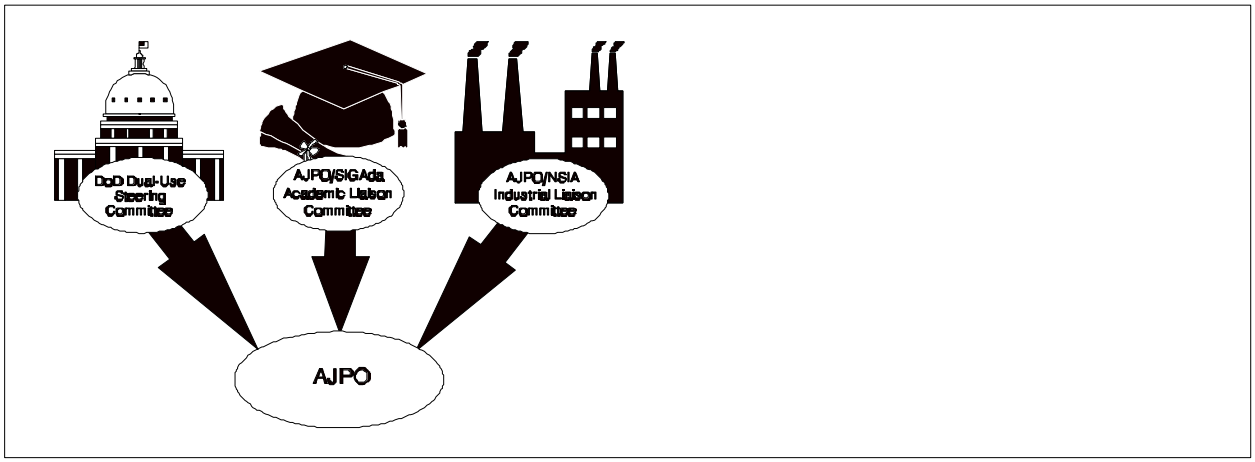
In addition, the AJPO acts as the voice of Ada within the Department, and represents the DOD in public forums throughout the world.



The AJPO will also be responsible for monitoring the direction of the Ada Dual-Use effort. To accomplish this, the roles and responsibilities of the AJPO's staff have been realigned as shown in Exhibit 4-1. Each element of this plan is managed by one of the liaison officers in an attempt to maintain management cognizance, focus, and control over its execution. Job descriptions for each of the positions in the organization can be found in Appendix F.

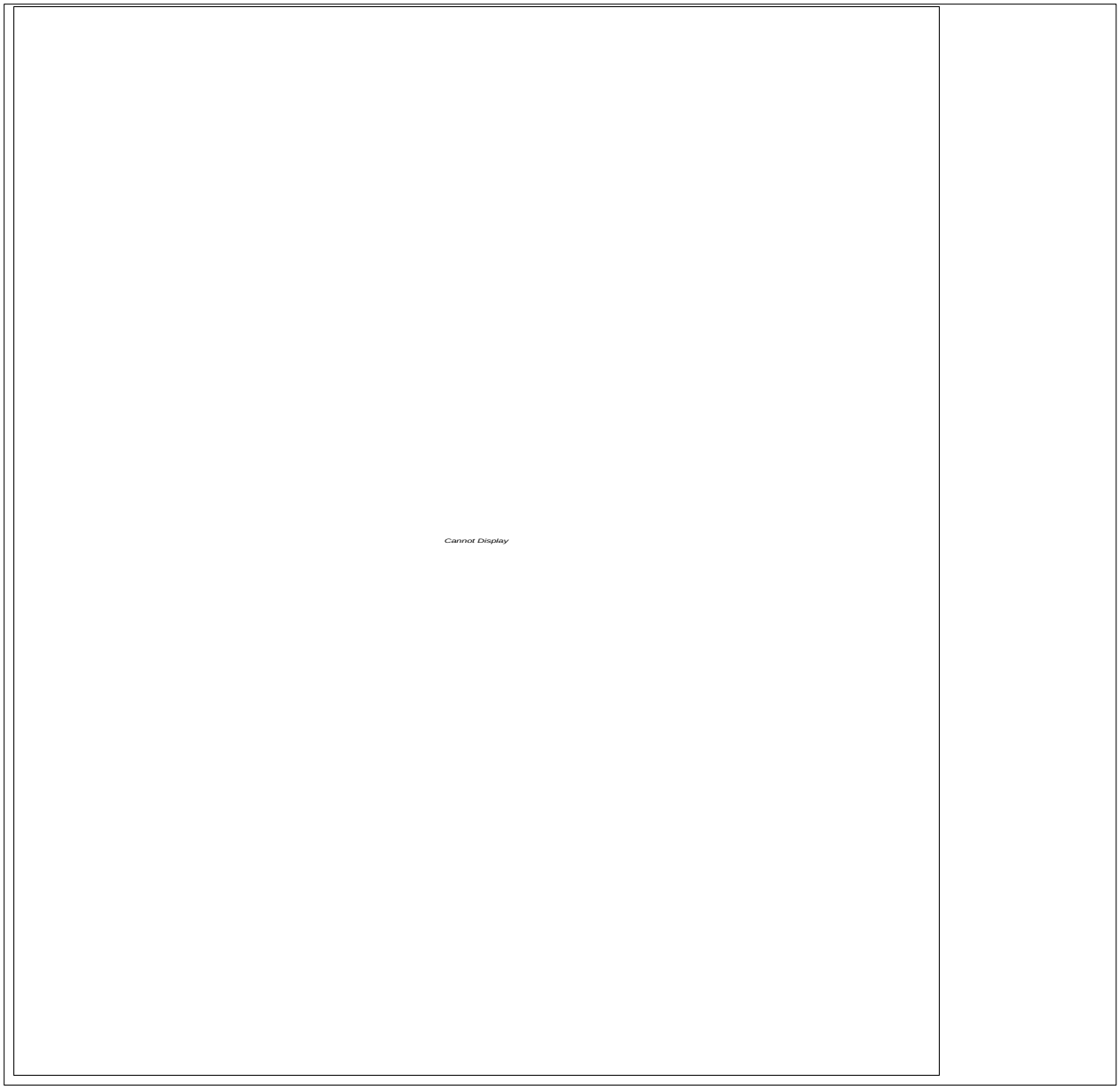
In addition, the AJPO maintains a direct line of communication with its stakeholders using the liaison committee structure illustrated on the next page in Exhibit 4-2. These committees will provide guidance and advice to the AJPO in establishing the focus of the program, updating program plans, and establishing the priority of program tasks. Input from these communities is essential to keep the AJPO activities focused on the stakeholders' interests.

The ASD(C3I) will chair the DOD Dual-Use Steering Committee. SIGAda and National Security Industrial Association (NSIA) will sponsor their respective committees and will also be responsible for selecting committee members. The Dual-Use Steering Committee will be composed of senior software officials who will provide guidance and direction to the AJPO based upon the respective needs of their organizations. Appendix G, Liaison Committee Descriptions, provides detailed descriptions for the committees.



4.1.2 Work Breakdown Structure

DISA has developed a ***well-planned and controlled*** approach for managing this program. This plan is broken into discrete work units. Each of these is goal-oriented and delivers a product. This breakdown is illustrated through a Work Breakdown Structure (WBS) which is shown on the next page in Exhibit 4-3. A complete WBS for the first two years of the program has been developed. This WBS provides a framework for tracking actual and assessing progress relative to original goals. This WBS was used as the basis for developing the integrated program schedule which can be found in section 5 of this plan. It also serves as the basis for program control at the thrust, area, activity, and task levels. It identifies the five major thrusts: ***Increase Marketing, Establish Partnerships, Provide Support and Incentives, Re-enforce Commitment, and Maintain Current AJPO Activities***. As already noted, each of these thrusts have been broken down further into specific areas, activities, and tasks. The program will be managed at the task level and reported at the activity level. If performance is questionable, problems can be traced to the offending task and be quickly rectified. Standard project management techniques will be used to initiate work, terminate work, and to report progress. Frequent reviews will be conducted to maintain control of the program and risk will be managed proactively.



4.1.3 Task Management

DISA will implement a task management approach that will provide the AJPO with a ***high degree of visibility into and control*** over progress. A ***measurement mechanism*** will be incorporated into the approach to ensure that tasks are adding value and contributing to the success of the overall program. Each task has been prioritized based on its applicability to commercialize Ada, accelerate and leverage Ada 9X, and build an Ada support base; each of which supports the overall objective of increasing the use of the Ada language in the defense, and commercial sectors. The priorities and their associated definitions are, in ascending order:

DESIRED - Must be funded in the future-term or opportunities will be

lost

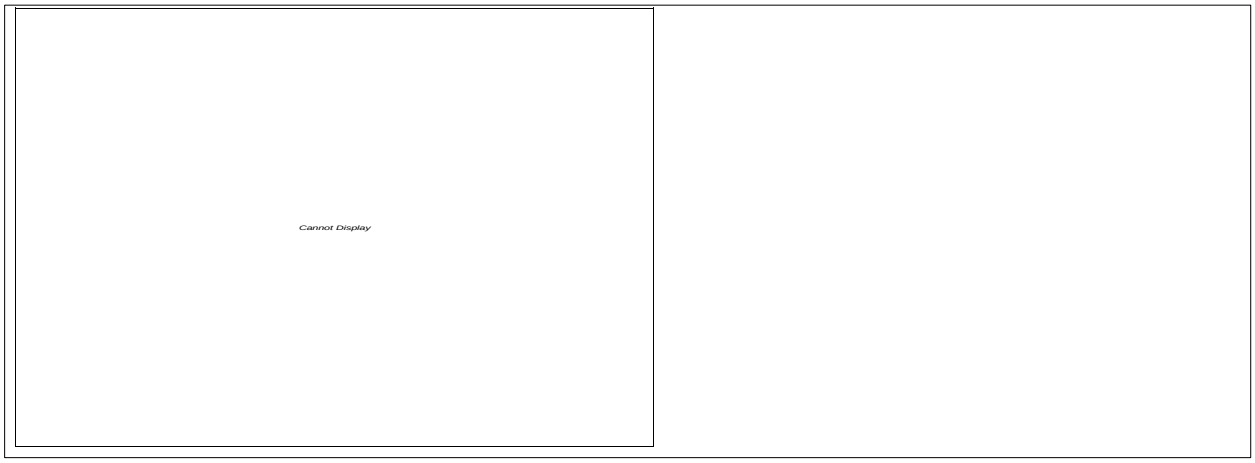
NECESSARY - Must be funded in the mid-term to yield results
ESSENTIAL - Must be funded in the near-term to be effective
CRITICAL - Must be funded immediately to make an impact

The results of this prioritization can be found in Exhibit 4-4. Note that tasks that have already received funding were not prioritized and will not appear in this exhibit.

	Marketing	Partnerships	Support & Incentives	Commitment
Desired (Future-Term)		Industry Good Ideas Government Good Ideas University Good Ideas	Next Generation Bindings	
Necessary (Mid-term)		AJPO/FBI Partnerships Other Government Agency Partnerships	ASIS Wrapper Technology	Handbook Handbook Pilot Pilot Course Training Program
Essential (Short-term)		Publish Monographs AJPO/HBCU Partnerships AJPO/NIST Partnerships AJPO/Automobile Partnerships AJPO/Financial Partnerships AJPO/Medical Partnerships	Populate Bindings Libraries Build Class Libraries Update Bindings Plan	
Critical (Immediate)	Market Survey Ada Business Case Image Change Campaign Disseminate Message	AJPO/COTS Partnerships AJPO/SEI Partnerships	Required Bindings Programmer Toolset	

Exhibit 4-4. Task Prioritization

The program will be managed at the task level and reported at the activity level. Progress on each activity will be evaluated quarterly. If it appears that a task or activity is not making progress, it will be terminated and other options will be pursued. The proposed task management process for the Ada Dual-Use Program is shown in Exhibit 4-5.



As program funding is received, a review of the WBS and the task priorities will be conducted. The appropriate task(s) will be selected for execution based on its priority and the current goals of the program. Once tasks for the activity have been selected, the work authorization process shown in Exhibit 4-5 will be carried out. This process involves the issuance of the task orders, the review and approval of task proposals, and the issuance of the delivery order. The AJPO will closely monitor all program tasks to ensure that they are successfully supporting program objectives. The review process described in the next section will be implemented to track program status. The AJPO Director or designee will assess the performance of each task during monthly reviews and determine whether or not to continue working on it. Each activity has established measures of success that will facilitate the review of task performance. By using these measures, management will be able to distinguish between activity and progress. Upon successful completion of the task, the delivery order will be accepted and closed.

4.1.4 Program Control

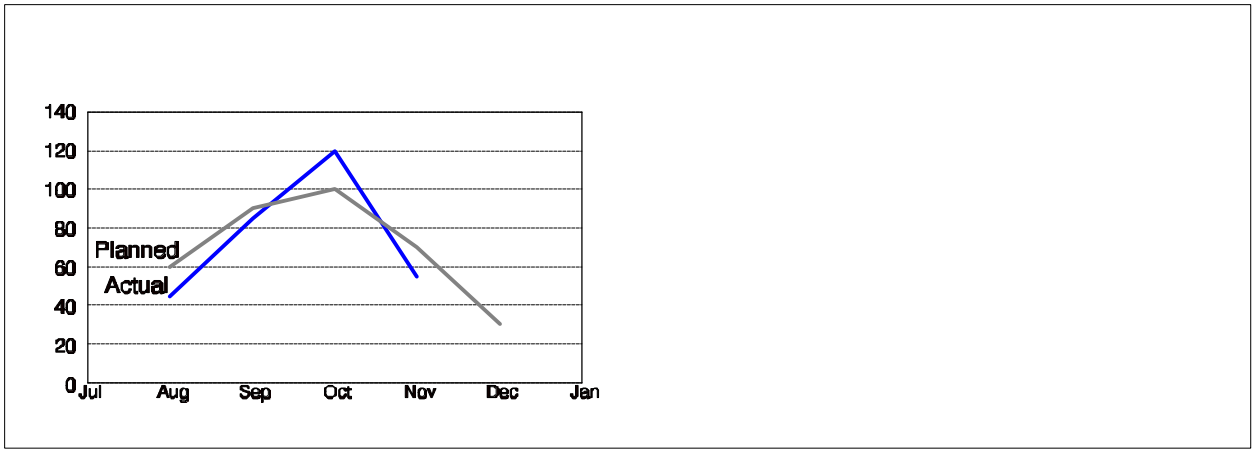
The AJPO will control the program using proven project management techniques. Budgets and schedules will be allocated via the WBS to the task level. Tasks will be tracked and reported monthly so the AJPO can assess progress of an integrated collection of tasks in a timely manner. Planning, Budgeting, and Scheduling (PBS) concepts will be used along with earned value reporting to ensure the AJPO is getting the highest return for its dollar. The AJPO will require periodic progress reports to include the following information:

Summary of progress during the reporting period
Schedule information
Status of work performed
Problems and corrective recommendations
Planned activities for the next reporting period
Significant changes in organization, method of operation, or schedule
Cost information
Measures of success assessments
Costs incurred for reporting period and costs to date
Administrative data, including trips, result of trips, and significant telephone calls

These reports will record the status of milestones and deliverables and assess progress relative to agreed upon measures of success. To maintain project continuity and prudent management of the task managers, the AJPO will hold periodic task reviews to address the following topics:

Overview of program status
Schedule performance update
Actual cost status versus planned costs
Contract labor hours
Status of previous action items
Potential problems and relevant issues
Measures of success
Action items

Exhibit 4-6 depicts a typical actual versus budgeted monthly cost summary report. Such a report is deceptive because it depicts the actual cost against a plan, but it does not reflect whether the progress made justifies the expenditures. This is the reason that the AJPO will use earned value reporting whenever feasible. Such reporting provides insight into whether progress has been made and whether the trends look favorable. It also requires the performer to explain cost and schedule variances when they exceed predefined thresholds for work accomplished.



This thorough and continual formal assessment process will be used to ensure that relevant issues are identified, fully analyzed, and resolved in a timely manner.

4.1.5 Partnership Management

Partnerships are both an innovative and exciting prospect for the DOD. Innovative, because the DOD is not accustomed to being on an equal footing with its suppliers. Exciting, because the prospects are endless, if partners share equally in both the risks and the rewards. Combining this opportunity with the management skills of DISA and the AJPO, provides the DOD with the potential to achieve the goals it established for Ada quickly and economically.

Because DISA cannot predict with certainty what partnerships will be desired or needed in the future, this Program Plan does not lock the Government into partnering with specific industries, universities, or other Government agencies. Rather, the plan puts a structure and process into place that allows the DISA to manage partnerships using commercial, rather than military models.

The process focuses on establishing partnerships that create a mutually beneficial situation for both participants. It produces maximum benefits for all stakeholders, allows the DOD to be innovative and goes "outside of the box" in a quest for good ideas. The structure and process revolves around five simple steps:

Publish Broad Area Announcement (BAA)
Establish selection criteria
Rate and rank proposals
Negotiate awards
Manage effort

Broad Area Announcements will be published to alert prospective partners to the opportunity and get them to show interest in establishing a partnership. The announcements may be focused on a specific industry or commercial need. They may ask for suggestions and ideas that eventually lead to commercial products.

Once the BAA has been released, DISA and the AJPO will establish criteria, including a rating process, for selection of a partner. The selection criteria will be unique to every prospective partnership -- the criteria for choosing a compiler company to build a programming environment is a lot different than the criteria for choosing a petrochemical company to build a sensor system. One criteria, however, will remain constant throughout all of the partnerships -- the need to create mutual benefit. DISA is only going to award and establish partnerships when they provide equitable returns for both partners.

Once the proposals have been submitted against a solicitation that follows the BAA, DISA will rate and rank proposals and make selections using the criteria developed. DISA will then sign the partnership or contractual agreement after negotiations are completed. The AJPO will manage the partnership effort using the approach described in section 4.1.3, Task Management. Finally, the AJPO will concentrate on the most important requirement -- the prompt delivery of the agreed upon product(s).

4.2 Risk Management

Project risk will be controlled through application of formal risk management procedures.

Risk is an inherent factor in any program. A critical part of effective project management is recognizing potential risks and then managing those risks to neutralize negative effects. In turn, the objective of risk management is to identify and minimize all risks and to address those that may arise. Often the management team can avoid project schedule delays and cost overruns by assessing risks and analyzing tradeoffs before projects are started by selecting an appropriate technical approach. Good risk management is a proactive, not reactive, element of management and proper risk analysis is vital in keeping costs under control, meeting deadlines, and ensuring the best possible results.

4.2.1 Risk Management Methodology

A structured risk management methodology will be employed throughout the Ada Dual-Use Program to identify, analyze, and mitigate risk. The techniques employed depend on the management indicators used on the program.

The objectives of this risk management methodology are to:

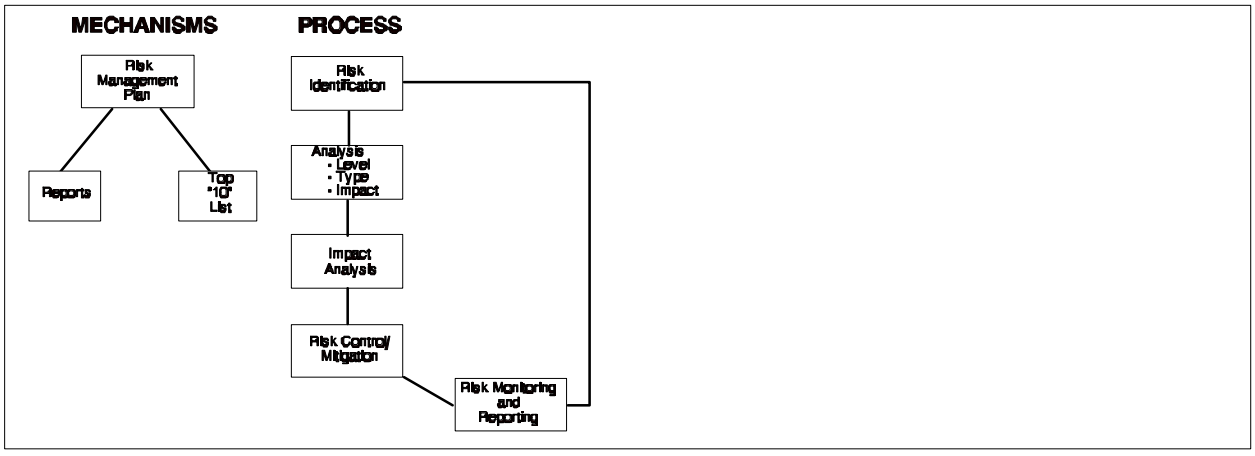
Identify and assess program risk concerning technical issues, cost, or schedule and categorize these risks as high, medium, or low

Develop a risk mitigation strategy or alternative approach for the most significant risks

Implement the strategy or alternative approach WHEN required

Implement the risk management process throughout the Ada Dual-Use effort, beginning at program initiation

Exhibit 4-7 illustrates the plan's overall approach to risk management. Primary responsibility for implementing the risk management methodology rests with the AJPO Liaison Officers. A key element of the risk management process includes carefully defined metrics to monitor and report risks in a timely manner. Each task will be reviewed monthly, at In-Process Reviews (IPR), with the AJPO Director or responsible designee. Risk area status and mitigation activities will be reported at these reviews. The project's top-10 risk-item tracking technique will be used to isolate risks. This technique involves ranking the project's most significant risk items and tracking resolution progress. The top-10 risk-item list is an effective tool for keeping the project team focused on a project's critical success factors. Once risks have been identified, an impact analysis will be performed and mitigation strategies will be identified.



4.2.2 Current Risks

Table 4-1 outlines the current known risks for the Ada Dual-Use Program. These risks are being managed using the risk management approach detailed in section 4.2.1 and the resolutions methods are described in detail in section 4.1.

	Risk	Resolution
1.	Funding availability	Plan organization to accept incremental funding through: prioritization of tasks 2-year window for task level details that allows for plan updates 5-year projection that allows for modification and refinement
2.	Lack of stakeholder buy-in	Improve communications by establishing the following forums: DOD Dual-Use Steering Committee AJPO/SIGAda Academic Liaison Committee AJPO/NSIA Industrial Liaison Committee
3.	Continuity of effort	Government will commit to multi-year partnerships when it results in mutual benefits, for both partners, and when sufficient funding is available
4.	Staffing	Government will commit to multi-year partnerships when it results in mutual benefits, for both partners, and when sufficient funding is available.
5.	Measuring progress	The plan provides measures of success Management team will hold In-Progress Reviews (IPRs) to review: tasks monthly activities quarterly areas semi-annually thrusts annually
6.	Schedule risk	Short, discrete task and subtasks identified

Table 4-1. Risk Matrix

		Well-defined deliverables and timely reporting
7.	Cost growth	Periodic cost reporting and earned value determination Review of external funds expended and earned-value assessment
8.	Ada 9X misses object-oriented window of opportunity	Prioritization of funding to support rapid maturation of Ada 9X and support environments

Table 4-1. Risk Matrix (cont'd)

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5.0 INTEGRATED PROGRAM SCHEDULE

Realistic and attainable schedules managed at the task level

The integrated program schedule for the Ada Dual-Use Program is shown on the following pages. The milestone chart presented contains the thrusts, areas, activities, tasks, and major milestones for the first two years of the effort. The AJPO will maintain this schedule in an automated project management system to ensure that deadlines are understood, commitments are met, and progress is monitored. The dates shown in the schedule are predicated on the timely funding of program activities. Task durations are represented by bars and milestones are symbolized by diamonds.

APPENDICES
Appendix A
Ada Dual-Use Task Summary

A. Increase Marketing

See section 3.1 for a complete description of this thrust. Table A-1 provides a summary of the areas and activities in this thrust.

Activity	Measure Of Success	Deliverables
Support Marketing Initiative	Targets of opportunity are identified in the commercial sector within 6 months	Market survey report List of targeted commercial markets
	Ada2 s market share increases by	Promotional materials Advertisements

	10% in the first year and 20% in the second Marketing responsibilities and functions fully transition to an Ada trade association within two years AdaIC inquiries, from non-DOD personnel, increase by 100% a year CEOs of targeted Fortune 500 companies receive copies of marketing videos 50% of the companies receiving marketing videos respond for more information about Ada	Marketing videos Market reports (penetration status)

Table A-1. Increase Marketing Activity Summary

Support Ada Promotion	Evidence pertinent to commercial requirements that supports Ada2 s benefits over competitor software engineering technology (e.g. the Business Case) is published within three months of the marketing survey CEOs of targeted Fortune 500 companies receive copies of the business case for Ada 50% of the companies receiving the business case for Ada respond for more information about Ada The Ada Business Case is presented at one non-Ada related conference within 6 months of its completion The benefits of Ada are presented at two non-Ada related conferences this year and four conferences next year Articles illustrating the benefits of	Benchmark data Business case Empirical database Success stories

	Ada are published in two non-Ada related trade magazines this year and four magazines next year

Table A-1. Increase Marketing Activity Summary (cont'd)

A.1 Promote Ada Area

See section 3.1.1 for a complete description of this area.

A.1.1 Support Marketing Initiative

The Support Marketing Initiative activity builds on existing efforts to aggressively pursue new targets of opportunity. The Support Marketing Initiative activity will be conducted by an Ada trade association under the leadership of the AJPO. It establishes the approach for promoting Ada's dual-use. A marketing strategy, based on market survey results, will be developed and maintained by the Ada trade association. The resulting campaign will change the image and broaden the appeal for Ada within both the defense and commercial sectors. The goal of the campaign is also to ***create the market pull*** needed to convince commercial vendors that there is a market outside of the DOD for Ada products. For a description of this activity, see section 3.1.1.1.

A.1.1.1 Conduct Market Survey (Critical)

The Conduct Market Survey task identifies the barriers, the competition, and the targets of opportunity for Ada commercialization. The primary goal of this market survey is to identify where and when resources should be allocated in the effort to increase the use of Ada. The AJPO will be responsible for the survey and will employ a professional marketing firm using focus groups and other proven marketing techniques to pinpoint targets of opportunity. The survey will initially focus on the three industries identified in the Institute Partnerships with Industry Program activity (section 3.2.1.2). These three industries (automobile manufacturing, financial services, and medical instrumentation) are ideal because of their projected growth, profitability, and applicability. The market survey task will last for approximately six months.

The results of the survey will be used to shape the subsequent marketing campaign. This task collects, validates and summarizes the data that serves as the foundation for a marketing plan. The following table contains the task inputs, deliverables and estimated duration for the Conduct Market Survey task.

Task Inputs	Deliverables	Estimated Duration
AJPO inputs Results of SIGAda promotion Ada Software Alliance inputs Focused Ada Research (FAR) 1990 market survey	Market survey report	6 Months

A.1.1.2 Conduct Image Change Campaign (Critical)

The Conduct Image Change Campaign task expands on the current efforts of the AJPO, creating promotional material to enforce the perception that ***Ada is a winner***. The campaign will use various media to communicate the message (e.g., videos, diskettes, advertisements, games), each targeting a specific audience with different promotional techniques. The message conveyed by this campaign will enforce the notion that Ada is the object-oriented solution of choice for high-integrity and safety-critical software systems. The AJPO will provide leadership and support to the trade association executing this campaign.

The image change campaign will have two thrusts. The first will target horizontal markets, conveying general information about Ada, its features, its benefits, and its successes in the commercial market. The second thrust will target the specific industries described in section 3.2.1.2, where the opportunity for increasing Ada's presence is favorable and there are established Ada success stories. The campaign will promote Ada as a software engineering solution of merit, not as DOD's "silver bullet." Using this philosophy, the campaign will take advantage of the second "window of opportunity" that was identified during the Ada Dual-Use Workshop. The campaign will target executives and practitioners in commercial firms using proven techniques.

The following table contains the task inputs, deliverables and estimated duration for the Conduct Image Change Campaign task.

Task Inputs	Deliverables	Estimated Duration
Market Survey Feedback from current marketing activities (e.g., ASA, SIGAda, AdaIC)	Promotional materials Advertisements Ada videos Mailings/brochures	12 Months

A.1.2 Support Ada Promotion

The AJPO must effectively communicate the successes of existing Ada projects to private industry to complement the marketing activities that will be conducted by the Ada trade association. These successes should be detailed in terms that are relevant to commercial firms and must be compiled and conveyed in a coherent format. Hard data on cost, productivity, and quality should be presented to demonstrate the benefits of the Ada language over its competitors. Teleconferencing, bulletin boards, and seminars are some of the means to be used to communicate the benefits of Ada to larger audiences outside of the DOD. These efforts comprise a mass media program aimed at communicating Ada's successes and benefits into the commercial and academic sectors to support the marketing efforts of the Ada trade association. For a description of this activity, see section 3.1.1.2.

A.1.2.1 Develop Ada Business Case (Critical)

The Develop Ada Business Case task takes existing cost, productivity, and quality data taken from completed Ada projects and builds a hard hitting business case that quantitatively demonstrates the advantages of Ada. This plan capitalizes on U.S. Air Force efforts to build a national data repository. It is proactive and aimed at getting managers the information they need to make informed decisions. The task also develops an empirical database that will retain the benchmarking data. The AJPO will populate this database with the benchmarking metrics so that the information can be used in the future for a variety of comparative analyses.

Benchmarking the performance of Ada projects will establish a comparable framework that will encourage private industry to invest in Ada technology and increase Ada use. To facilitate the on-going capture of benchmarking data, a database will be developed for the information. This database will be enhanced and expanded to provide decision-makers with information about Ada's advantages.

The following table contains the task inputs, deliverables and estimated duration for the Develop Ada Business Case task.

Task Inputs	Deliverables	Estimated Duration
Benchmark report SSCAG software database U.S. Air Force data repository prototype American Society of Quality Control (ASQC) benchmarking processes	Cost, productivity, and quality database Industry benchmarks and norms Comparative analysis Business case	12 Months

A.1.2.2 Disseminate the Ada Message (Critical)

The Disseminate the Ada Message task involves the distribution of business and technical information regarding Ada through a variety of vehicles and forums. Its purpose is to publish and present success stories and substantiated facts regarding Ada and its capabilities to the general public and to targeted markets. Briefings will be conducted in support of the Ada promotion in conjunction with trade association and professional society meetings and events. The purpose of these briefings will be to disseminate success stories and substantiated facts regarding Ada and its capabilities. Industry-wide, rather than Ada specific, shows and conferences will be targeted for participation by the AJPO. Local governments, high schools, colleges and small businesses will also be targeted using a bulletin board that will contain news items and general information regarding Ada. The international community will be targeted through an annual "State of Ada Message" that will be broadcast via a world-wide teleconference.

The AJPO strategy to increase its outreach revolves around getting the message that Ada makes good business sense outside of the DOD. Mass media and broadened communications channels

are keys to success in this area.

The following table contains the task inputs, deliverables and estimated duration for the Disseminate the Ada Message task.

Task Inputs	Deliverables	Estimated Duration
Market survey	Bulletin board	18 Months
Ada business case	Publicity materials	
Hard data and lessons learned	Promotional materials	
	Dual-Use workshops	
	World-wide teleconferences	
	Trade shows	
	Professional society events	

B. Establish Partnerships

See section 3.2 for a complete description of this thrust. Table A-2 provides a summary of the areas and activities in this thrust.

Activity	Measure Of Success	Deliverables
Institute Partnerships with Universities Program	More than 20 responses are received for each university partnership BAA An increase in Ada courseware and teaching tools by 10% in the first year, and 25% in the following year An increase in the number of universities offering an Ada course by 10% in the first year, and 25% in the following year 25% of universities currently offering an Ada course adopt Ada as their standard language for teaching software engineering within two years	Curriculum Courseware Teaching artifacts Monographs CD-ROMs Other joint partnership products
Institute Partnerships with Industry Program	More than 10 responses are received for each Industry partnership BAA The creation of one Ada competitor (competitive in price, features, and development platforms) in the PC market in the next two years. The creation of one Ada competitor (competitive in price, features, and	Reusable software components PC-based development kit Visual programming environment Commercial AdaSAGE Proofs of concept Other joint partnership products

	development platforms) in the workstation market in the next two years. Prices for Ada compilers, tools, and programming environments will drop to a level that is competitive to other language systems An increase in the Ada marketshare by 10% in the first year and 20% in the second year	

Table A-2. Establish Partnerships Activity Summary

Institute Partnerships with Government Program	More than 10 responses are received for each Government partnership The creation of one civil agency partner per year for each year in the program An increase in the Government Ada marketshare by 10% in the first year and 20% in the second year	Joint product Ada research & development results Reusable software components Proofs of concept Standardized bindings Other joint partnership products

Table A-2. Establish Partnerships Activity Summary (cont'd)

B.1 Initiate Partners Program

See section 3.2.1 for a complete description of this area.

B.1.1 Institute Partnerships with Universities Program

Universities are the breeding ground for tomorrow's leaders in industry. Pascal is the predominant teaching language with Ada, C, and C++ current contenders. Entering into dual-use partnerships with universities will broaden Ada's use in both educational and research activities. By creating research partnerships, excitement and Ada support will be spawned first to professors and graduate students, then to undergraduates, and eventually to industry and Government circles. Excitement will be built and professors and students alike will want to use

Ada in all of their endeavors. For a description of this activity, see section 3.2.1.1.

B.1.1.1 Form AJPO/University/Historically Black Colleges and Universities Partnerships (Essential)

The AJPO/University/Historically Black Colleges and Universities (HBCUs) Partnerships task will create Ada showpieces at teaching and research universities, HBCUs, and other minority institutions. Working with Government and industry, the AJPO will aggressively pursue work study programs, research fellowships, intern assignments, and donations of equipment and software that universities can use to develop Ada capability and skills which their students can use to get jobs and reward their employers.

Once again, the benefits are clear for both partners. The Government will create a larger pool of Ada skills, knowledge, and abilities that it, and industry, can tap to build high-integrity, reliable systems. Universities will get support to pursue course upgrades, curriculum enhancements, and exciting research. Everyone benefits as these partnerships unfold.

The Program Plan allows for continuing AJPO/University/HBCU partnerships year after year. A solicitation will be issued annually and awards made based on criteria that favor commercialization.

The following table contains the task inputs, deliverables, and estimated duration for the Form AJPO/University/HBCU Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Partnership proposals	Solicitation	11 Months
	Course materials	
	Teaching artifacts	
	Curriculum recommendations	
	Final report	

B.1.1.2 Form AJPO/SEI Partnerships (Critical)

Although the SEI is not a university, this institution develops curricula recommendations and course materials for use by many of the premier educational institutions. The AJPO/SEI Partnerships task exploits these opportunities by having the SEI produce curricula for Ada-based software engineering and courseware for program manager/contracting officer education. Such courseware will focus on teaching middle managers why they should use Ada and how to exploit its capabilities in an acquisition environment. Other partnership products are being contemplated. For example, an "Ada 9X refresher" course and an "object-oriented techniques in Ada" course are being proposed as candidates.

After the first partnership is complete, the DOD will identify the next potential partnership. The Program Plan allows for continuing AJPO/SEI partnerships year after year.

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/SEI Partnerships task.

Task Inputs	Deliverables	Estimated Duration
None	Ada-based software engineering curricula Courseware Instructors guide Videos Teaching artifacts	15 Months

B.1.1.3 Institute Surplus PC Program (Funded)

The availability of surplus PCs within DOD is a recurring event as computer environments are upgraded to provide enhanced features. At very low cost, the DOD can combine these PCs with free Ada compilers and course materials creating an educational Ada environment that can be supplied to high schools and junior colleges to help increase Ada's popularity.

From the institutions' perspective, this program decreases their financial burden of acquiring adequate tools to teach Ada and stimulates their teachers and students by providing courseware and a hands-on Ada teaching environment. From the Government's perspective, this program creates a larger base of Ada users to go forth and advocate the use of the language as they enter the university environment or job market.

This Institute Surplus PC Program task is currently funded and the following table contains the task inputs, deliverables, and estimated duration.

Task Inputs	Deliverables	Estimated Duration
Surplus PCs Free Ada compiler	Instructional materials Pilot results	15 Months

B.1.1.4 Publish Monographs (Essential)

The Publish Monographs task puts relevant Ada information into the hands of students quickly and cheaply. The AJPO, universities, and industry cooperate to generate software engineering in Ada application notes for teaching purposes using material supplied by professors and publishing capabilities provided industrially. Everyone wins including the DOD because cycle time to get needed material onto the university bookshelves is shortened by a factor of eight. Monographs are especially needed during the transition to Ada 9X because textbooks may not be readily available when the product is launched.

The DOD will choose the monograph based on current market demand and the needs of the Ada 9X project. After the first monograph is complete, the DOD will identify the next potential

monograph to sponsor in the series. The program plan allows for DOD to develop several monographs annually. This is an extremely exciting project because the return on investment for all parties involved is large.

The following table contains the task inputs, deliverables and estimated duration for the Publish Monographs task.

Task Inputs	Deliverables	Estimated Duration
Proposals	Contract Outlines Monographs	13 Months

B.1.1.5 Institute Good Idea Program (Desired)

The Institute Good Idea Program task encourages innovation by funding good ideas so they can be pursued in a proof of concept mode. Once proven, an actual product may be developed and marketed under the partners program. These awards are also exciting because they can stimulate universities to develop innovations in Ada that can not be produced elsewhere.

A good idea may be awarded every three months based on the submission and approval of an acceptable proposal. Good Idea Awards will only be granted to proposals that are innovative and present mutually beneficial scenarios for both the DOD and academia.

The following table contains the task inputs, deliverables and estimated duration for the Institute Good Idea Program task.

Task Inputs	Deliverables	Estimated Duration
BAA Good Idea proposals	Contract Proof of concept Final report Monthly status reports	12 Months

B.1.2 Institute Partnerships with Industry Program

This partnering activity is designed to increase commercial use by targeting selected markets in industry. By partnering with industry, the DOD can act as a venture capitalist to create the market pull needed to increase commercial use of Ada. Both parties agree to invest if they can each realize an attractive return on their investment. The DOD provides seed money aimed at increasing the commercial use of Ada. It invests only when there is a return that justifies the capital. The DOD and its partner take risks and share in the rewards. The AJPO can also exert increased market pull by utilizing its large buying power to create opportunities. For a complete description of this activity, see section 3.2.1.2.

B.1.2.1 Form AJPO/Automobile Manufacturing System Partnerships (Essential)

The automobile manufacturing domain has been identified as an area to target for partnerships. This partnership demonstrates Ada's worth within the manufacturing industry in the areas of robotics, process control and factories of the future. In addition, active sensor systems which are placed aboard automobiles of the future will be targeted This will create interest for Ada within the automobile industry and provide the DOD with technology transfer and sharing that justifies joint investments. Also, documented project testimonials and benchmarks will be provided as results unfold.

The task consists of the DOD soliciting for partnerships and signing the contractual agreement with a partner. The team will develop the product(s) as agreed to in the contract. At the end of the development phase, the team will demonstrate the product at a pilot site to demonstrate the value of its DOD contents. During the next phase, the partner will be responsible for developing spin-off commercial products. They will also create a final report with testimonials, lessons learned, and benchmark data.

After the first partnership is complete, the DOD will identify the next potential partnership. Partnerships are formed only when both parties yield an equitable return on their investments.

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/Automobile Manufacturing System Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Partnership proposals	Demonstrations Product (DOD content) Spin-off products (commercial content) Final report Benchmark data	Targeted for FY96

B.1.2.2 Form AJPO/Financial Services Partnership (Essential)

The financial services industry has also been identified as prime area to target for partnerships. This industry has requirements for high-integrity systems that Ada can service. This partnership will establish Ada within the traditional financial services industry. As the technology emphasis evolves within the financial services industry from mainframe-based systems to distributed client-server systems, the influx of systems reengineered in Ada will mutually benefit the financial services industry and the Government. In addition, this will create interest for Ada within a traditional MIS environment and provide the DOD with products that justify its investments. Also, documented project testimonials and benchmarks will be provided as results unfold.

The task consists of the DOD soliciting for partnerships and signing the contractual agreement with a partner. The team will develop the product(s) as agreed to in the contract. At the end of

the development phase, the team will demonstrate the product on-line at a pilot site to demonstrate value of its DOD content. During the next phase, the partner will be responsible for developing the spin-off products. They will also create a final report with testimonials, lessons learned, and benchmark data.

After the first partnership is complete, the DOD will work to identify the next potential partnership. Partnerships are formed only when both sponsors yield an equitable return on their investments

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/Financial Services Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Partnership proposals	Demonstrations Product (DOD content) Spin-off products (commercial content) Final report Benchmark data	Targeted for FY96

B.1.2.3 Form AJPO/Medical Instrumentation System Partnerships (Essential)

The medical instrumentation industry has shown a strong emphasis on quality, future growth, and profitability and, therefore, has been targeted as a prime candidate for dual-use partnerships with the DOD. This partnership demonstrates Ada's worth within the medical instrumentation industry in developing high-quality software within a safety-critical marketplace. This will create interest for Ada within the industry and provide the DOD with dual-use opportunities that justify its investments. Also, documented project testimonials and benchmarks will be provided as results unfold.

The task consists of the DOD soliciting for partnerships and signing the contractual agreement with a partner. The team will develop the product(s) as agreed to in the contract. At the end of the development phase, the team will demonstrate the product's advantages based on its DOD content, thereby solidifying the case for Ada. During the next phase, the partner will be responsible for developing spin-off products. They will also create a final report with testimonials, lessons learned, and benchmark data.

After the first partnership is complete, the DOD will identify the next potential partnership. Partnerships are formed only when both parties yield an equitable return on their investments.

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/Medical Instrumentation System Partnerships task.

Task Inputs	Deliverables	Estimated Duration

Partnership proposals	Demonstrations Product (DOD content) Spin-off products (commercial content) Final report Benchmark data	12 Months

B.1.2.4 Form AJPO/COTS Software Partnerships (Critical)

Ada environments (integrated collections of tools used by software engineers) are perceived to be less evolved than those available for other languages; they are more expensive and less "friendly." In addition, the tools available for Ada are less plentiful and lack market appeal. In order to change this situation, the DOD is looking to join forces with COTS vendors to develop competitively priced Ada tools which have strong commercial market appeal. These tools, when mass marketed, will open the Ada market to a wide variety of applications and users (e.g., programmers, students, experimenters, etc.).

After the first partnership is complete, the DOD will identify the next potential partnership. Partnerships are formed only when both parties yield an equitable return on their investment.

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/COTS Software Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Market survey Partnership proposals	Demonstration Product (DOD content) Spin-off products (commercial content) Final report Benchmark data	12 Months

B.1.2.5 Form AJPO/AdaSAGE Partnerships (Funded)

AdaSAGE is a Department of Energy (DOE) tool that allows a user to quickly create a user interface and a database in the Ada programming language. The DOD is one of the largest users for this tool, especially in its data-driven applications. To spin-off AdaSAGE, the tools need to be available to be sold in the commercial market. This task tries to tackle the spin-off by upgrading the product and making it more user-friendly, placing the source code into reuse libraries, and making AdaSAGE source code available to companies that will use it to create commercial products. Agreements have been made with DOE to enable the DOD to give copies of AdaSAGE away to companies who want to derive products from it.

The following table contains the task inputs, deliverables and estimated duration for the Form

AJPO/AdaSAGE Partnerships task.

Task Inputs	Deliverables	Estimated Duration
AdaSAGE releases AdaSAGE documentation	Source code placed into reuse library (DOD content) AdaSAGE derived products (commercial content) Final report	21 Months

B.1.2.6 Institute Good Idea Program (Desired)

The Institute Good Idea Program task encourages innovation by funding good ideas so they can be pursued in a proof of concept mode. Once proven, an actual product may be developed under the partners program and marketed by the partner. The implementation of proven ideas may have considerable demonstrated commercial appeal.

A good idea contract may be awarded every quarter based on the submission and approval of an acceptable proposal. Good Idea awards will only be granted to proposals that are innovative and present mutually beneficial results for both the DOD and industry. The recipient will then be allotted the next six months to provide a proof of concept and final report for the idea.

The following table contains the task inputs, deliverables and estimated duration for the Institute Good Idea Program task.

Task Inputs	Deliverables	Estimated Duration
Good Idea proposal	Contract Proof of concept Final report	12 Months

B.1.3 Institute Partnerships within Government Program

There are many opportunities for the DOD to partner with other Government organizations or agencies to develop products useful to both parties. There is no better promotion for Ada than to build something that demonstrates Ada's advantages to other Government agencies. These partnerships will demonstrate products that have value to both sponsors. For a description of this activity, see section 3.2.1.3.

B.1.3.1 Form AJPO/FBI Partnerships (Necessary)

The DOD and the FBI are exploring the possibility of establishing a partnership to develop a national police fingerprint information system in Ada. The infrastructure for the system will be built using reusable Ada parts to demonstrate that Ada can be used to reduce development time and cost. The U.S. Air Force RAASP library will be interfaced to the DSRS and other reuse mechanisms to provide a hypertext medium for interchange. System software building blocks

will be developed to populate this library which will be placed into operation as part of the system. Several police departments will act as beta sites to test the prototype after an initial operational capability is made available. Both the DOD and FBI benefit from the program. The DOD gets the FBI to help fund the development of building blocks which can be used on migration systems. The FBI inserts infrastructure and parts in reduced time at a fraction of estimated costs.

After the prototype is completed, the AJPO and FBI will continue to add capability until a first version of the system is available for beta test at the police department sites. Continuation of the AJPO/FBI partnership is planned, however, an annual review is contemplated to ensure progress meets expectations.

The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/FBI Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Reuse library catalog Domain models Architectural guidelines	Police information systems prototype Infrastructure parts Final reports	12 Months

B.1.3.2 Form AJPO/NIST Partnerships (Essential)

NIST is yet another agency pursuing dual-use projects. Their emphasis focuses on factories of the future, and other application areas where standardization is essential. They also conduct a major dual-use effort looking at a components-based software engineering industry. The AJPO wishes to cooperate with NIST and encourage its dual-use partners to use Ada as their programming language of choice as they develop their products for commercial use.

All parties in the AJPO/NIST dual-use partnerships will benefit from Ada because it brings tremendous benefits in reusability, reliability, and maintainability to the table. DOD will gain factory users, while NIST will be able to show relevancy of its program via actual use.

Joint projects which are mutually beneficial will be pursued under this task. An annual review will be held to assess progress and determine if the relationship should continue.
The following table contains the task inputs, deliverables and estimated duration for the Form AJPO/NIST Partnerships task.

Task Inputs	Deliverables	Estimated Duration
Reuse library catalog Domain models Architectural guidelines	Prototypes Products Reports	15 Months

B.1.3.3 Form Partnerships with Other Agencies (Necessary)

The DOD will continue to explore partnering with other agencies. The partnerships with other agencies will be structured so that both partners benefit. Considerable advantage can be gained through the use of Ada in agencies like the Internal Revenue Service, Social Security Administration and the National Institute of Health. When the timing is right, a partnership will be formed and activity to promote the commercial use of Ada started. One such opportunity a year is currently planned.

The following table contains the task inputs, deliverables and estimated duration for the Form Partnerships with Other Agencies task.

Task Inputs	Deliverables	Estimated Duration
Reuse library catalog Domain models Architectural guidelines	Products Reports	Targeted for FY96

B.1.3.4 Institute Good Idea Program (Desired)

This Institute Good Idea Program task is designed exactly like the previous two. It spawns innovation by sponsoring proof of concept programs within the Government. Innovations specific to the way the Government does business will be sought.

A good idea may be awarded every quarter based on the submission and approval of an acceptable proposal. Good Idea awards will only be granted to proposals that are innovative and present mutually beneficial results for both the DOD and other Government agencies.

The following table contains the task inputs, deliverables and estimated duration for the Institute Good Idea Program task.

Task Inputs	Deliverables	Estimated Duration
Good Idea proposal	Proof of concept Final report	12 Months

C. Provide Support and Incentives

See section 3.3 for a complete description of this thrust. Table A-3 provides a summary of the areas and activities in this thrust.

Activity	Measure Of Success	Deliverables
Develop Bindings	Provide two high demand bindings (e.g. POSIX) within 9 months after the release of the Ada 9X standard.	Bindings plan Bindings generator Bindings reports

	Both bindings will be used on a migration system within 2 months of their completion Provide two other high demand bindings within 18 months after the release of the Ada 9X standard. Both bindings are used on a migration system within 2 months of their completion Confirmation that high demand bindings have been used on 5 migration systems (e.g. GCCS) within 1 year of the completion of the bindings mentioned above Ada 9X compilers come complete with a standard set of high-demand bindings	Technology demonstrations Proofs of concept Reusable software components Lessons learned
Develop Tools/Environments	The creation of two Ada competitors (competitive in price, features, and development platforms) in the programmer toolset market in the next two years. Ability to acquire compiler tools at a cost comparable to alternative commercial packages Ada 9X compiler prices are available at a level comparable to other languages Ada 9X compilers come complete with a set of standard class libraries	Tool white paper Tools plan Tool set(s) Tools plan Class library(s) Compiler upgrade procurement Proofs of concept Lessons learned reports

Table A-3. Provide Support and Incentives Activity Summary

C.1 Increase Ada Support

See section 3.3.1 for a complete description of this area.

C.1.1 Develop Bindings

The Develop Bindings activity focuses on identifying needed bindings, developing and validating them, and placing them along with their test cases in a reuse library so that they are easily accessible by academic, industry, and Government users. The philosophy used in selecting bindings is to see what is required to address the needs of migration systems and the current Ada marketplace. Bindings selections should be made from the viewpoint that they are needed as a set to satisfy the requirements of both active users and major systems that are desirable to have developed in Ada. These bindings enhance the appeal of Ada to both current and future users. For a complete description of this activity, see section 3.3.1.1.

C.1.1.1 Develop Bindings Plan (Funded)

The Develop Bindings Plan task provides a vision document identifying required bindings for Ada 9X, as well as, future bindings for evolving standards. The plan will identify standard bindings demanded by the marketplace (e.g., Windows/NT), those needed by migration systems (e.g., POSIX, X-Windows), and will look to evolving standards to identify future bindings (e.g., CORBA, OLE). SIGAda has formed a Bindings Working Group to make recommendations. These recommendations and the inputs of other users will be used as inputs to the plan.

The following table contains the task inputs, deliverables, and estimated duration for the Develop Bindings Plan task.

Task Inputs	Deliverables	Estimated Duration
Bindings white paper SIGAda bindings working group recommendations	Bindings plan Monthly status reports	4 Months

C.1.1.2 Update Bindings Plan (Essential)

The Update Bindings Plan task assesses progress to date of the tasks in the Develop Bindings activity and updates the bindings plan. This task will ensure that the bindings being developed are aligned with the DOD's needs. The task will ensure that the bindings needed for the future are pursued. In addition, the update to the bindings plan takes another look at Ada 9X, seven months later, to ensure the proper bindings are being developed. The task will update the original bindings plan.

The following table contains the task inputs, deliverables, and estimated duration for the Update Bindings Plan task.

Task Inputs	Deliverables	Estimated Duration
Additional SIGAda recommendations	Bindings plan update	2 Months

C.1.1.3 Develop Bindings Generator (Funded)

The Develop Bindings Generator task provides Ada with easy access to COTS products and information processing standards (e.g., ANSI, IEEE, ISO). Many COTS products have C interfaces or are written in C. Many standards have bindings specified in C. This task will provide a bindings generator tool to translate existing bindings and interfaces from C to Ada. The generator could be used by developers to produce as much as 80% of the Ada 9X code required to implement the Application Program Interfaces (APIs). The bindings generator task is currently funded.

The following table contains the task inputs, deliverables, and estimated duration of the task.

Task Inputs	Deliverables	Estimated Duration
Bindings generator proposal	Bindings generator User's guide	4 Months

C.1.1.4 Develop Required Bindings (Critical)

The Developed Required Bindings task will develop the bindings identified in the bindings plan (task C.1.1.1). The task is responsible for developing standardized, reusable bindings for industry standards such as SQL, POSIX, and various Graphical User Interfaces (GUIs). This task enables Ada 9X to co-exist with popular COTS products. It also improves the market appeal of Ada products because they can now interface with a variety of application interfaces.

The development of required bindings will be achieved by this task. The following table contains the task inputs, deliverables, and estimated duration for the Develop Required Bindings task.

Task Inputs	Deliverables	Estimated Duration
Ada Dual-Use Bindings Plan	Binding(s) Submission of bindings for reuse library Final report	15 Months

C.1.1.5 Prototype Next Generation Bindings (Desired)

The TAFIM demands SQL, POSIX, and X-Windows bindings. The bindings strategy has placed an emphasis on developing standardized, reusable bindings for these industry standards. However, the DOD must also look to the future and develop bindings for evolving standards its users will depend upon like CORBA, OLE, and X.500. It would be remiss in its responsibilities if it didn't make a conscious effort to deal with the future along with the present.

The Prototype Next Generation Bindings task addresses the future and helps prepare the Government as these standards become national and international standards. The task is projected to start in the first quarter of FY96.

The following table contains the task inputs, deliverables and estimated duration for the Prototype Next Generation Bindings task.

Task Inputs	Deliverables	Estimated Duration
Ada Dual-Use Bindings Plan	Binding(s) Next generation bindings submissions	Targeted for FY96

C.1.1.6 Populate Reuse Library with Bindings (Essential)

This task takes, as input, the bindings generated from the Developed Required Bindings task and submits them for incorporation into a reuse library. The task will ensure the binding(s) that are chosen for a given standard are packaged, abstracted, tested, classified and documented per the requirements of the reuse library. Just having a binding and binding test suite is not enough when the component is designated for potential DOD-wide reuse. Additional effort is required to package the component so that users find it easy to reuse. In addition, effort is required to abstract the component and its capabilities and demonstrate that it is error-free. Finally, additional documentation may be needed to help users ascertain how to reuse the component.

The following table contains the task inputs, deliverables and estimated duration for the Populate Reuse Library with Bindings task.

Task Inputs	Deliverables	Estimated Duration
Bindings Validation test suites	Validated bindings Abstracts Reuse guide Certification report Other reuse documentation	9 Months

C.1.1.7 Prototype Wrapper Technology (Necessary)

Wrappers provide the means to interconnect Ada reusable packages simply and with a minimum of effort. They take Ada building blocks at any level of the software hierarchy (e.g., packages, subsystems) and link them together so that the semantics associated with data passing can be controlled. They standardize the interface and permit information exchange to be coordinated.

This task explores the possibility of using a glue language to link Ada modules together without the use of a supporting library. If successful, binding modules in any language will be simplified because metastructures will be used to enable data abstractions. Wrappers can then be used to encapsulate existing reusable software and elements of migration systems. Such software would not then have to be repackaged to fulfill canonical form packaging standards.

These concepts have been used in a prototype environment. This task tries to take these

concepts and apply them experimentally using modules from a reuse library. If successful, the techniques will be packaged and brought to market years earlier than using conventional technology transfer methods.

The following table contains the task inputs, deliverables and estimated duration for the Prototype Wrapper Technology task.

Task Inputs	Deliverables	Estimated Duration
Research results	Proof of concept (prototype or technology demo)	Targeted for FY96

C.1.2 Develop Tools/Environments

Ada tools and environments are far more expensive than those available for alternative languages. Although excellent environments exist in Ada, more and richer toolsets are needed to create the draw to the language. Support is needed to provide additional tools and bring down the entry prices or Ada will not be an attractive alternative to prospective commercial users. For a description of this activity, see section 3.3.1.2.

C.1.2.1 Finalize Ada Semantic Interface Specification (ASIS) (Necessary)

The Finalize ASIS task finishes the ASIS project and gets the tool vendors to use the standard to interconnect their products with each other and with the repositories that form the integration mechanisms in today's software engineering environments. The task will finalize the standard and recommend ways to encourage commercial tool vendors to use it. The task includes a pilot project that will be used to demonstrate how the standard works in practice. Once the pilot project is complete, the project plan will be updated to provide the best way to popularize the ASIS standard. The task also creates a validation suite for the standard.

The following table contains the task inputs, deliverables, and estimated duration for the Finalize ASIS task.

Task Inputs	Deliverables	Estimated Duration
Current ASIS standards proposal	ASIS standard Handbook (how to use the standard) Project plan Final report (includes reports experiences) Validation test suite	12 Months

C.1.2.2 Fund Compiler Upgrades (Funded)

As the Ada 9X release rapidly approaches, so does the demand for Ada 9X compilers. The DOD needs to use its purchasing power to buy Ada 9X compilers at the most favorable price. This task accomplishes this goal by negotiating contracts with several vendors for large quantity purchases. These purchases will give compiler vendors a compelling justification to move out and build their Ada 9X compilers using their own funds in the near term.

The AJPO will require a validation of a fully compliant Ada 9X compiler prior to award of the contract. An evaluation of the compiler's performance will also be conducted before any contemplated contract is awarded to a vendor. This will create the market push needed to get firms to invest immediately in compilers and their related toolsets. The AJPO will also provide a contract vehicle for organizations seeking to purchase compilers. This will simplify their acquisition of needed toolsets and create the necessary market push. Everyone wins as the availability of Ada 9X toolsets is accelerated.

The following table contains the task inputs, deliverables and estimated duration for the Fund Compiler Upgrades task.

Task Inputs	Deliverables	Estimated Duration
Requirements for Ada 9X Compiler purchase Compiler proposals	Solicitation Validation report Evaluation report Contract Purchase orders	18 Months

C.1.2.3 Build Class Libraries (Essential)

The Build Class Libraries task creates a set of standard Ada 9X packages to support programmers trying to take advantage of object-oriented techniques in their applications. These packages will contain the reusable components which can be instantiated as tagged types to implement concepts of inheritance and polymorphism in Ada. Efforts will be focused on writing routines that take advantage of these Ada 9X features to address reuse at the service and utility levels of the architecture. Such routines are similar to those provided as frameworks in other popular operating environments.

The task will identify the requirements for the required routines and then develop those routines. The following table contains the task inputs, deliverables, and estimated duration for the Build Class Libraries task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X standard Class library white paper	Requirements document Class libraries plan Class library routines and documentation	12 Months

C.1.2.4 Build Programmer Toolset (Critical)

The Build Programmer Toolset task will provide Ada 9X programmers with a suite of support tools to assist them in their duties. The tools that will be provided are the low level aids typically provided as part of a lower-CASE toolset. Candidates tools for these toolsets have been identified in the bindings white paper. By providing such tools, Ada 9X will have the support environment it needs to become a success and the language of choice.

The task will identify the required tools and then develop them in priority order. The following table contains the task inputs, deliverables, and estimated duration for the Build Programmer Toolset task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X standard Bindings white paper	Requirements document Programmer toolset plan Toolset software and documentation	12 Months

D. Re-Enforce Commitment

See section 3.4 for a complete description of this thrust. Table A-4 provides a summary of the areas and activities in this thrust.

Activity	Measures Of Success	Deliverables
Provide Implementation Guidance	DOD organizations use implementation guidance to consistently interpret the Ada mandate.	Implementation guidance handbook Handbook pilot report
Provide Training	20% of DOD contracting and acquisition personnel, and 20% of DOD PEOs/PMs are trained in the scope and intent of the Ada mandate within two years.	Training program Pilot program results report

Table A-4. Re-Enforce Commitment Activity Summary

D.1 Strengthen Ada Mandate

See section 3.4.1 for a complete description of this area.

D.1.1 Provide Implementation Guidance

The effectiveness of the mandate is currently suffering due to inconsistent interpretation by different organizations in the DOD. The phrases "where cost-effective" has caused confusion among many DOD components. The DOD must offer consistent interpretations of its Ada policy or support for Ada will erode. Guidance must be provided to DOD components on the scope and intent of the Ada mandate. The policy and its implementation must be clearly explained and elaborated so that DOD personnel have the basis for complying with the law. For a description of this activity, see section 3.4.1.1.

D.1.1.1 Develop Handbook (Necessary)

The Develop Handbook task develops a handbook to provide guidance for both military technical and management personnel. The handbook focuses on the acquisition process and provides PEOs/PMs/PCOs with guidance on how to determine Ada's cost-effectiveness across the software life-cycle. The handbook is important because it tells DOD personnel moving to Ada 9X and the MIL-STD-498 how to address the waiver process. Ada 9X transition will be featured along with associated cost issues in the initial version of the document.

The following table contains the task inputs, deliverables and estimated duration for the Develop Handbook task.

Task Inputs	Deliverables	Estimated Duration
MIL-STD-498 MIL-HDBK-287 DOD Directive 3405.1 DOD Instruction 5000.2 DOD 5000.2-M DOD Instruction 8120.2	Handbook	6 Months

D.1.1.2 Conduct Handbook Pilot (Necessary)

The Conduct Handbook Pilot task demonstrates that the guidance provided in the handbook works in practice. Sample projects will be selected to test the effectiveness of the handbook. Based upon results of the pilot, the handbook will be modified to improve its effectiveness.

The following table contains the task inputs, deliverables and estimated duration for the Conduct Handbook Pilot task.

Task Inputs	Deliverables	Estimated Duration
Handbook	Pilot program results report Updated handbook	6 Months

D.1.2 Provide Training

It is not sufficient to merely prepare and publish Ada policy. To deploy this policy, the DOD must also make the appropriate investments in infrastructure, contracting strategy, and transition support. Infrastructure, which includes personnel and training, is the critical component in making the Ada policy a success. If the people who administer the policy don't understand it, they won't use it. For a complete description of this activity, see section 3.4.1.2

D.1.2.1 Develop Training Program for DOD Professionals (Necessary)

The Develop Training Program for DOD Professionals task provides the necessary training to inform DOD middle managers of Ada policies and directives. Course material will be developed for the staff supporting the decision-maker, program managers, contracting specialists, and other personnel affected by the Ada mandate.

There is a close coupling between this effort and that being conducted by the SEI under our academic initiatives (see B.1.1.2). The SEI will develop awareness training for incorporation into the Defense Acquisition University and DSMC curriculum. This task will supplement this material with detail and take the courses into the commands, program offices, and shops responsible for implementation. In essence, it will support a roving show that will be held to educate Program Executive Officers, Program Managers, Contracting Officers, and their staffs on "why" Ada and "what" their responsibilities are under the law.

The following table contains the task inputs, deliverables and estimated duration for the Develop Training Program for DOD Professionals task.

Task Inputs	Deliverables	Estimated Duration
SEI courses Air Force BOLDSTROKE course	Training materials for use by DOD/Service Schools Separate course (if warranted) Training materials Work orders	6 Months

D.1.2.2 Conduct Pilot Course Offerings (Necessary)

The Conduct Pilot Course Offerings task evaluates the training courses to determine where they need improvement. The courses will be updated based upon the results of the pilot.

The following table contains the task inputs, deliverables and estimated duration for the Conduct Pilot Course Offerings task.

Task Inputs	Deliverables	Estimated Duration
Training course	Pilot results report Updated training material	6 Months

E. Maintain Current

See section 3.5 for a complete description of this thrust. Table A-5 provides a summary of the areas and activities in this thrust.

Activity	Measures Of Success	Deliverables
Support Core Ada	10% of new or upgraded projects agreeing to use Ada 9X in 1996	Ada 9X standard Ada 9X transition plan ACVC (updates) ALS/N (final version) ACES (update) Information (both in paper and electronic form) Promotional materials GNU compiler
Support ATIP Program	One migration system successfully using Ada to SQL binding within 2 years. 10% of the projects receiving results (e.g., testimonies, success stories) of an ATIP project(s) adopt results	SBIR study reports Proofs of concept Technology demonstration Commercial spinoff products
Support Ada 9X Transition	Ada 9X adoption rate increases annually by 10% One migration system successfully transitioned to Ada 9X by 1998	Ada 9X standard Ada 9X transition plans AdaSAGE enhancements Bindings (currently underway) Ada 9X transition handbook Startup team results
Support AJPO Program Management	N/A	AJPO host support Printing and travel support

Table A-5. Maintain Current AJPO Activities Activity Summary

E.1 Support Current Ada Programs

Programs being pursued are aimed at continuing efforts started in past years, including the Ada 9X standardization project. See section 3.5.1 for a complete description of this area.

E.1.1 Support Core Ada

The Ada Program needs a consistent level of support to maintain its momentum and support of its current user base. This activity provides such support. The activity is designed to develop Ada 9X standards and supporting tools/environments, provide a compiler evaluation and

validation capability, address Ada transition support issues, and disseminate Ada materials and information to stakeholders. For a description of this activity, see section 3.5.1.1.

E.1.1.1 Finalize Ada 9X (Funded)

Both the American National Standards Institute (ANSI) and the International Standards Organization (ISO) require that standards be periodically updated to address the needs of their user communities. When ANSI/MIL-STD-1815A-1983 was revisited, it was determined that it needed to be revised to address known problems (e.g., priority inversion), provide enhancements, and incorporate support for state-of-the-art programming techniques (e.g., inheritance). This upgrade is commonly known as Ada 9X.

The standards bodies have a five year review cycle for languages like Ada. As a result, this activity must be carried on as an integral part of the language standardization maintenance cycle.

This task is responsible for the management of the upgrade of the Ada language standard. The task also focuses on developing related tools (e.g. GNU compiler), educational opportunities, and bindings. It is also developing the related validation test suites and basic teaching tools needed to support the revision.

The following table contains the task inputs, deliverables and estimated duration for the Finalize Ada 9X task.

Task Inputs	Deliverables	Estimated Duration
ANSI/MIL-STD-1815A-1983 Ada '83 library Distinguished reviewer suggestions GNU compiler Standards recommendations and rationale	ISO Ada standard FIPS Ada standard GNU compiler Ada 9X educational environment ACVC revision Ada '83 and Ada 9X mappings	21 Months

E.1.1.2 Expand AdaIC (Funded)

The Expand AdaIC task is an outreach program which provides current information on topics ranging from the use of Ada within DOD and industry to tools and compilers for Ada developers. This information is provided in a number of forms: by electronic files; in on-line searchable databases; and through information flyers, reports and quarterly newsletters.

The AdaIC does more than just provide information. It acts as the AJPO's right arm in keeping abreast of what's going on in the Ada industry. It supports promotional activities by exhibiting at trade shows and conferences. The AdaIC maintains a hot-line to answer queries about Ada utilization and capabilities. The AdaIC also maintains the AJPO's computational resources and

supports group dialog through its many bulletin boards and network services.

This task provides the resources for the AdaIC to continue to perform its vital functions. Such support is integral to the success of the program.

The following table contains the task inputs, deliverables and estimated duration for the Expand AdaIC task.

Task Inputs	Deliverables	Estimated Duration
Project results & lessons learned Hot-line queries Press releases Announcements and articles Success stories	Computational resources Information via hot-lines, newsletters, an electronic bulletin board, and internet Material to exhibit at various trade shows and conferences Bulletin boards Reports describing who's using Ada, current validated compilers, etc. Bibliographies	21 Months

E.1.1.3 Update Evaluation and Validation (Funded)

Evaluation and Validation of Ada implementations is required by the DOD to help prevent the proliferation of Ada dialects. This is important because variation impedes portability and makes it hard to reuse existing legacy code (including COTS). The Evaluation and Validation task ensures conformance of Ada compilers to standards as required by the DOD. The task also maintains the compiler validation capability test suite and evaluates compiler performances.

The following table contains the task inputs, deliverables and estimated duration for the Update Evaluation and Validation task.

Task Inputs	Deliverables	Estimated Duration
Compilers and tools Policy and procedures Resolution of technical issues Operational experiences ACES ACVC	Updated policy and procedures ACES updates ACVC updates	21 Months

E.1.1.4 Develop Educational Environment (Funded)

The academic community is lacking an inexpensive Ada teaching environment. By providing

students with such an environment, the DOD would make it easier for professors to teach and promote Ada. The AJPO wants to make an inexpensive environment available to students so they will purchase it, use it, and endorse it. Providing a state-of-the-art environment that provides advanced delivery methods and management support will entice schools to use Ada, especially if it can be sold for less than $100 for the equipment popular on campus. The environment will be available on IBM compatibles and Macintoshes.

The following table contains the task inputs, deliverables and estimated duration for the Develop Educational Environment task.

Task Inputs	Deliverables	Estimated Duration
Proposals	PC environment/textbook Mac environment/textbook	21 Months

A competitive procurement is underway to acquire such a teaching environment. Once awarded, the source will develop and market a textbook/environment that will make Ada attractive to most students at universities.

E.1.2 Support ATIP Program

The ATIP program accelerates the move to Ada by proving concepts, providing help to projects, and demonstrating ways to accelerate technology transfer. It aids the DOD in overcoming barriers to Ada adoption by focusing on key technical issues that need to be resolved in a timely fashion. The program also spins off products that may have commercial value. For a description of this activity, see section 3.5.1.2.

E.1.2.1 Support ATIP Projects (Funded)

The Support ATIP Projects task develops proofs of concept and technology demonstrations to provide risk reduction for the insertion of Ada technology into DOD systems. Currently, there are approximately 20 on-going projects to help with technology insertion. These projects address education, bindings, and technology issues that benefit the entire Ada community. This task will be phased out in mid-1995 in favor of the Ada Technology Insertion Partners Program (ATIPP) task which brings the effort in line with the focus of the program plan by emphasizing dual-use partners.

The results of the ATIP projects stimulate military organizations to adopt Ada technology. They break down barriers and demonstrate Ada works in practice. Wide dissemination of these results yields a positive return on investment because they break down barriers that impede utilization.

The projects also determine if a proof of concept or technology demonstration would have any merit commercially. If so, the product will be spun-off commercially.

The following table contains the task inputs, deliverables and estimated duration for the Support ATIP Projects task.

Task Inputs	Deliverables	Estimated Duration
FY93 ATIP project results	Proofs of concept Technology demonstrations Commercial spin-off products	15 Months

E.1.2.2 Support ATIPP Projects (Funded)

The Support ATIP Partners (ATIPP) Projects task develops proofs of concept and technology demonstrations aimed at reducing risk in commercializing Ada products developed by dual-use partners. These projects address the full range of products (e.g., education, bindings, tools, technology) that can benefit the entire Ada community.

The projects determine if a proof of concept or technology demonstration has commercial merit. If so, the product will be spun-off commercially.

The following table contains the task inputs, deliverables and estimated duration for the Support ATIPP Projects task.

Task Inputs	Deliverables	Estimated Duration
FY93 ATIP project results	Proofs of concept Technology demonstrations Commercial spin-off products	18 Months

E.1.2.3 Capitalize on Small Business Innovative Research (SBIR) (Funded)

The Capitalize on SBIR task focuses on harnessing small business to accelerate and increase the commercial use of Ada. Similar to the previous task, the SBIR task develops proofs of concept and technology demonstrations. Using a 3-stage process, these proofs and demonstrations can lead to commercial products. In stage 1, the concept is proven. Stage 2 develops a prototype, while stage 3 has the commercial partner focus on commercialization.

The following table contains the task inputs, deliverables and estimated duration for the Capitalize on SBIR task.

Task Inputs	Deliverables	Estimated Duration
SBIR solicitation	Proposals Study reports Proofs of concept Technology demonstrations Commercial spin-off proposals	12 Months

E.1.2.4 Develop Ada 9X SAMeDL (Funded)

The Develop Ada 9X SAMeDL task is responsible for developing the binding to SQL and Ada 9X. Standardization of this binding will be coordinated by the DISA Center for Standards (CFS) in conjunction with the Federal Information Processing Standards Committee.

The following table contains the task inputs, deliverables and estimated duration for the Develop Ada 9X SAMeDL task.

Task Inputs	Deliverables	Estimated Duration
Ada SQL standard Ada 9X specifications	SQL/Ada 9X binding	18 Months

E.1.2.5 Establish University Grant Program (Funded)

The Establish University Grant Program task focuses on the development of curricula, courses, and course material that teach the effective use of Ada. It is intended for computer science, business, engineering, information management, and related curricula in U.S. post-secondary schools. The courses should emphasize the use of the object-oriented features of Ada 9X to encourage better software engineering. The results of the projects should be integrated into the institution's academic program and should be suitable for wide dissemination and adoption by educators planning similar courses.

The following table contains the task inputs, deliverables and estimated duration for the Establish University Grant Program task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X standard	Course Course materials Teaching artifacts Curricula	19 Months

E.1.3 Support Ada 9X Transition

This activity provides DOD programs with the help they need to make a smooth transition from Ada 83 to Ada 9X. The activity focuses on providing tools, guidance, and support required to expedite the movement to Ada 9X. For a description of this activity, see section 3.5.1.3.

E.1.3.1 Develop Ada 9X Transition Handbook (Funded)

The Ada 9X Transition Handbook task provides guidance for program managers who are planning the transition to Ada 9X. The handbook is issue-based and action-oriented. It addresses the perceived needs of the PEO/PM community and provides the necessary guidance for those in both the development and maintenance stages of the life cycle. The handbook will be

modeled after the highly successful Ada Adoption Handbook published by the SEI.

The following table contains the task inputs, deliverables and estimated duration for the Develop Ada 9X Transition Handbook task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X transition needs and concerns	Ada 9X Transition Handbook	18 Months

E.1.3.2 Develop Ada 9X Transition Plan (Funded)

The Develop Ada 9X Transition Plan task provides support to systems as they attempt to transition to Ada 9X. The planning template that will be developed will guide managers by identifying the issues that they must address as they plan the transition. The task utilizes the transition handbook from the previous task and the startup teams in the next task to help the transition go quickly and smoothly.

One transition plan a year will be supported. The transition plan for FY94 will target transition of a selected DISA migration system. The plan for FY95 will target transition of a Service system.

The following table contains the task inputs, deliverables and estimated duration for the Develop Ada 9X Transition Plan task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X Transition Handbook	Ada 9X Transition Plan	18 Months

E.1.3.3 Implement Ada 9X Startup Teams (Funded)

The Implement Ada 9X Startup Teams task supports projects executing Ada 9X Transition Plans. The team's objective is to help the PM make their transition to Ada 9X as quickly and efficiently as possible. The team will provide the PMs with the qualified staff support they need to be successful. The team will also assess the lessons learned and make the knowledge known through publications and updates to the Ada 9X Transition Handbook.

The first startup team begins in FY95 and they will execute the Ada 9X Transition Plan which was developed in FY94.

The following table contains the task inputs, deliverables and estimated duration for the Implement Ada 9X Startup Teams task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X Transition Plan	MOA	12 Months

	Final report (includes lessons learned & knowledge base) Updated Ada 9X Transition Handbook Updated Ada 9X Transition Plan

E.1.3.4 Implement Ada 9X Transition Training (Funded)

The Implement Ada 9X Transition Training task supports organizations in the transition to Ada 9X. It provides all levels of the organization with the training required to make the transition a success. A course will be designed for managers and project leaders to explain how upgrading from Ada 83 to Ada 9X affects the projects they manage. Another course will be designed for experienced Ada developers to help them gain a solid understanding of the Ada 9X language features.
The following table contains the task inputs, deliverables and estimated duration for the Implement Ada 9X Transition Training task.

Task Inputs	Deliverables	Estimated Duration
Ada 9X Transition Handbook Ada 9X Transition Plan	Courses Pilot result reports	21 Months

E.1.4 Support AJPO Program Management

This activity is to provide the support necessary for the AJPO to manage its program and maintain its administrative effectiveness. For a description of this activity, see section 3.5.1.4.

E.1.4.1 Support Printing and Travel (Funded)

The Support Printing and Travel task funds printing costs for the quarterly AdaIC Newsletter and for the travel expenses of AJPO personnel. It also provides support for a host of other small, but necessary subtasks.

The following table contains the task inputs, deliverables and estimated duration for the Support Printing and Travel task.

Task Inputs	Deliverables	Estimated Duration
Travel requests Others	Reports Travel reports AdaIC newsletter	21 Months

E.1.4.2 Provide AJPO Host Support (Funded)

The Provide AJPO Host Support task funds support for Sprint phone lines and the E-mail system currently hosted on the Software Engineering Institute's (SEI's) machines. These systems allow the AJPO to foster communications across the Ada industry. Inputs from, and dialog with, academicians, industry people and the overseas community is essential, especially as Ada 9X approaches.

The following table contains the task inputs, deliverables and estimated duration for the Provide AJPO Host Support task.

Task Inputs	Deliverables	Estimated Duration
None	E-mail	21 Months

Appendix B
Applicable Documents

The following documents, of latest issue, are applicable to this plan:

DOD DIRECTIVES:

1. DOD Directive 3405.1, Computer Programming Language Policy

2. DOD Directive 5000.1, Defense Acquisition

3. DOD Directive 5000.52, Defense Acquisition Education and Training Program

4. DOD Directive 8120.1, Life-Cycle Management (LCM) of Automated Information Systems

DOD INSTRUCTIONS:

1. DOD Instruction 8120.2, Automated Information System Life-Cycle Management Process, Review, and Milestone Approval Procedures

2. DOD Instruction 5000.2, Defense Acquisition Management Policies and Procedures

Referenced MIL-STDs:

1. MIL-STD-1815A, Ada Programming Language

2. MIL-STD-SDD, Software Development and Documentation (proposed STD 498)

3. MIL-STD-483A, Configuration Management Practices for Systems, Equipment, Munitions, and Computer Programs

4. MIL-STD-490, Specification Practices

5. MIL-STD-1521B, Technical Reviews and Audits for Systems, Equipments, and Computer Software

6. DOD-STD-2167A, Defense System Software Development

7. DOD-STD-2168, Defense System Software Quality Program

8. DOD-STD-7935A, Automated Data Systems (ADS) Documentation

MIL-HDBKs:

1. MIL-HDBK-287, A Tailoring Guide for DOD-STD-2167A

OTHER DOCUMENTS:

1. Ada Dual-Use Workshop Proceedings, 10/93, available from the Ada Information Clearinghouse (AdaIC)

2. Ada Dual-Use Success Stories, 4/94, available from the AdaIC

3. Ada Dual-Use Business Case, 4/94, limited distribution

Appendix C
Glossary

The following definitions are offered to clarify terms used within this document:

Activity: Activities are major efforts defined in the plan that actuate the goals of the Ada Dual-Use Program. Activities are defined with measures of success and are broken down into specific tasks.

Ada 9X: The version of the Ada programming language currently undergoing ANSI/ISO/FIPS standardization process.

Commercial Sector: Any organization outside of the Department of Defense, includes academia, other Government agencies and industrial firms.

Critical Success Factors: Conditions or requirements that have been defined as

essential if a program is to achieve its objectives.

Drop: The process of taking bindings generated from the Develop Required Binding task and populating the reuse library.

Dual-Use: A strategy that spins a technology developed for the military into the commercial sector. Ada is such a technology because it has demonstrated applicability in the commercial sector.

Market Pull: A strategy that creates incentives to entice potential partners and investors to invest in a targeted market.

Market Push: A strategy that uses management attention (and visibility) to force compliance with desired policies.

Measures of Success: Metrics which quantify the accomplishment of critical success factors.

Priority: Priority defines the level of urgency, with respect to time, for a task assignment. The four priorities used within this plan are (listed lowest to highest):

DESIRED - Should be funded in the future-term
NECESSARY - Must be funded in the mid-term
ESSENTIAL - Must be funded in the near-term
CRITICAL - Must be funded immediately

Second Window of Opportunity: The current movement of software firms towards object-oriented techniques, distributed processing, and client-server architectures. This technology gives Ada a chance to move to the forefront of programming languages. Ada missed its first opportunity in the late 1980's when there was a movement to PCs and workstations. This second chance for Ada is referred to as the "second window of opportunity".

Stakeholders: Members of an area who have a vested interest in seeing the AJPO's efforts succeed.

Task: Tasks are the work elements defined in the Ada Dual-Use Program Plan. Their execution results in measurable progress toward their respective activity's measures of success.

Thrust: Thrusts are the major elements of the Ada Dual-Use tactical approach. They relate directly to the program's critical success factors.

Vendors: Organizations who offer computer-related goods and services (e.g., hardware, software, training) for sale.

Venture Capitalist: An individual, group, or organization that invests in an undertaking, anticipating a significant return on investment.

Wrapper Technology: Software used to interconnect applications at any level of software hierarchy (e.g., packages, subsystems, systems) so that the semantics associated with data passing can be controlled and components can be easily integrated.

Appendix D
Acronyms

ACES	Ada Compiler Evaluation System
ACM	Association for Computing Machinery
ACVC	Ada Compiler Validation Capability
AdaIC	Ada Information Clearinghouse
AJPO	Ada Joint Program Office
AMO	Ada Maintenance Office
ANSI	American National Standards Institute
API	Application Program Interface
ARPA	Advanced Research Projects Agency
ASA	Ada Software Alliance
ASEET	Ada Software Engineering Education Team
ASIS	Ada Semantic Interface Specification
ASQC	American Society of Quality Control
ATIP	Ada Technology Insertion Program
ATIPP	Ada Technology Insertion Program Partners
AVF	Ada Validation Facility
AVO	Ada Validation Office
BAA	Broad Area Announcement
BOA	Basic Ordering Agreement
CAI	Computer Assisted Instruction
CAT	Computer Aided Training
C3I	Command, Control, Communications, and Intelligence
CASE	Computer-Aided Software Engineering
CEO	Chief Executive Officer
CFS	Center for Standards
CIM	Center for Information Management
CMM	Capability Maturity Model
CMT	Computer Managed Training
CORBA	Common Object Request Broker Architecture
COTR	Contracting Officer's Technical Representative
COTS	Commercial-Off-The-Shelf
CREASE	Catalog of Resources for Education in Ada Software Engineering
DAB	Defense Acquisition Board
DBMS	Database Management System
DISA	Defense Information Systems Agency

DOE Department of Energy
DSMC Defense Systems Management College
DSRS Defense Software Repository System
FFRDC Federally Funded Research & Development Center
FIPS Federal Information Processing Standards
GFE Government Furnished Equipment
GCCS Global Command and Control System
GUI Graphical User Interface
HBCUs Historically Black Colleges and Universities
HOL Higher Order Language
IEEE Institute of Electrical and Electronic Engineers
IOC Initial Operational Capability
IPR In-Progress Review
IPS Integrated Program Summary
ISO International Organization of Standards
JIEO Joint Interoperability and Engineering Organization
LCM Life Cycle Management
MAISRC Major Automated Information System Review Council
MIL-HDBK Military Handbook
MIL-STD Military Standard
MOA Memorandum of Agreement
NASA National Aeronautics and Space Administration
NIST National Institute of Standards and Technology
NSF National Science Foundation
NSIA National Security Industrial Association
OASD Office of the Assistant Secretary of Defense
OO Object-Oriented
OODBMS Object-Oriented Database Management System
OLE Object Linking and Embedding
PBS Program Budgeting & Scheduling
PCIS Portable Common Interface Set
PCO Program Contracting Officer
PCs Personal Computers
PCTE Portable Common Tools Environment
PEO Program Executive Officer
PM Program Manager
POSIX Portable Operating System Interface for Computing Systems
PR Progress Report
R&D Research & Development
SBIR Small Business Innovative Research
SEE Software Engineering Environment
SEI Software Engineering Institute
SIGAda Special Interest Group on Ada
SQL Standard Query Language
SSCAG Space System Cost Analysis Group
TAFIM Technical Architecture Framework for Information Management
TXE Software Systems Engineering Directorate

WBS Work Breakdown Structure
WWMCCS World-Wide Military Command and Control System

Appendix E
References

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Appendix F
Job Descriptions

This appendix contains the following job descriptions for the realigned AJPO:

Director
Army Liaison Officer
Navy Liaison Officer
Air Force Liaison Officer
Defense Information Systems Agency Liaison Officer
ATIPP Liaison Officer
Management Analyst
AdaIC Program Manager

DIRECTOR
ADA JOINT PROGRAM OFFICE

GRADE: O6 or GS15

JOB DESCRIPTION: The Director manages the Ada program and provides the vision, leadership and management focus to integrate the efforts of AJPO and the Ada industry into a viable international program. The Director also acts as the voice of the Ada within the Department and at public meetings throughout the world and with the press.

JOB FUNCTIONS:

* Prepare a five year Ada program plan and keep it up to date
* Communicate a vision and make sure that it is understood by affected parties
* Manage the initiative, providing the direction and control to keep it on track
* Interface with key executives in the Department, solicit their guidance/direction, and keep them appraised of program progress
* Work with executives from industry, the vendor community, and academia to understand their needs and solicit their recommendations for the program
* Work with the Liaison Committees and act on their recommendations when deemed appropriate
* Channel the energy and efforts of professional groups and trade associations toward the good of the overall initiative
* Keep the press informed of successes and progress
* Host the Annual Dual-Use Workshop and use it as a forum to solicit inputs
* Conduct "Reports to Industry" seminars across the nation and a teleconference aimed at keeping the industry informed of the AJPO's progress

* Take budget requests and sell them to management
* Build synergistic Government/industry/academic teams
* Represent the Department in public meetings, international events and forums

SKILLS, KNOWLEDGE AND ABILITIES:

* Recognized leader who commands the respect of the industry
* Skilled communicator (both written and oral)
* Skilled programmer who has the ability to master the Ada language
* Skilled manager who has the ability to manage a major international initiative
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Ability to build teams and keep staff focused toward objectives
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

ARMY LIAISON OFFICER
ADA JOINT PROGRAM OFFICE

GRADE: O5 or GS14/15

JOB DESCRIPTION: The Army Liaison Officer has management responsibility for the AJPO Ada Technology Insertion Program (ATIP) efforts. These efforts are aimed at demonstrating technical feasibility of innovative or state-of-the-art concepts that remove current barriers to Ada adoption. The Army Liaison Officer also manages the AdaIC contract and ensures that it provides responsive support.

JOB FUNCTIONS:

* Prepare Broad Area Announcements (BAA) for ATIP projects
* Prepare solicitations and participate in source selections
* Prepare a five year strategic plan for the ATIP area
* Prepare two year ATIP task plans and keep them current
* Act as the Contracting Officer's Technical Representative (COTR)
* Track progress and direct assigned ATIP efforts
* Integrate efforts into the consolidated Ada program plan
* Conduct ATIP in-progress reviews and assess status
* Review ATIP deliverables and ensure their technical integrity
* Approve the AdaIC annual program plan and oversee its execution
* Monitor AdaIC utilization and realign resources as necessary to provide responsive support
* Prepare estimates and manage budgets
* Build synergistic Government/industry/academic teams
* Represent the AJPO in public meetings and forums
* Prepare status reports and other management documents

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)
* Skilled programmer who has the ability to master the Ada language
* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of modern management theory
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Ability to plan and control multiple projects being pursued concurrently
* Ability to understand where the risks are and what to do to address them
* Ability to build teams and keep staff focused toward objectives
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

NAVY LIAISON OFFICER
ADA JOINT PROGRAM OFFICE

GRADE: O5 or GS14/15

JOB DESCRIPTION: The Navy Liaison Officer has management responsibility for the support and incentives initiatives. Because many of these products will be produced by the partners program, the Navy Liaison Officer must work closely with the ATIPP Manager. Both of these programs are focused to improve infrastructure and support, thus developing the pull needed to increase Ada's market penetration.

JOB FUNCTIONS:

* Prepare Broad Area Announcements (BAA) for the support and incentives initiatives
* Prepare solicitations and participate in source selections
* Prepare a five year strategic plan for the support and incentives initiatives
* Prepare two year task plans and keep them current
* Act as the Contracting Officer's Technical Representative (COTR)
* Track progress and direct assigned partners program efforts
* Integrate efforts into the consolidated Ada program plan
* Conduct program in-progress reviews and assess status
* Review program deliverables and ensure their technical integrity
* Act as liaison with the Department of Energy on all matters related to AdaSAGE
* Serve as the AJPO's representative on the AdaSAGE Engineering Management Group (EMG)
* Prepare estimates and manage budgets
* Build synergistic Government/industry/academic teams
* Represent the AJPO in public meetings and forums
* Prepare status reports and other management documents

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)

* Skilled programmer who has the ability to master the Ada language
* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of AdaSAGE and related technology
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Ability to plan and control multiple projects being pursued concurrently
* Ability to build teams and keep staff focused toward objectives
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

AIR FORCE LIAISON OFFICER
ADA JOINT PROGRAM OFFICE

GRADE: O5 or GS14/15

JOB DESCRIPTION: The Air Force Liaison Officer has management responsibility for the AJPO core Ada program. These efforts are primarily aimed at the Ada 9X standard, compiler validation support and plans to transition toward Ada 9X use.

JOB FUNCTIONS:

* Prepare a two year project plan for the Ada 9X program to wrap up standardization activities
* Approve Ada 9X Project Manager task plans and oversee their execution
* Transition the Ada 9X standard, when approved, to the Center for Standards for maintenance
* Initiate the Ada 9X effort and develop a five year plan to develop the standard and any required support
* Oversee the Ada 9X transition effort and provide needed support to projects
* Negotiate Memorandums of Agreements (MOAs) with Government partners
* Prepare two year core Ada program task plans and keep them current
* Act as the Contracting Officer's Technical Representative (COTR)
* Track progress and direct assigned core Ada program efforts
* Integrate efforts into the consolidated Ada program plan
* Conduct core Ada program in-progress reviews and assess status
* Review core Ada program deliverables and ensure their technical integrity
* Prepare estimates and manage budgets
* Build synergistic Government/industry/academic teams
* Represent the AJPO in public meetings and forums
* Prepare status reports and other management documents

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)
* Skilled programmer who has the ability to master the Ada language

* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Ability to plan and control multiple projects being pursued concurrently
* Ability to build teams and keep staff focused toward objectives
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

DEFENSE INFORMATION SYSTEMS AGENCY LIAISON OFFICER
ADA JOINT PROGRAM OFFICE

GRADE: O5 or GS14/15

JOB DESCRIPTION: The DISA Liaison Officer has management responsibility for the university program and any new initiatives that the AJPO undertakes. These efforts are primarily aimed at increasing academic and commercial use of Ada. The DISA Liaison Officer also manages the computational support provided for the AJPO.

JOB FUNCTIONS:

* Prepare Broad Area Announcements (BAA) for new initiatives
* Prepare solicitations and participate in source selections
* Prepare a five year strategic plan for the education area
* Acquire computational resources needed by the AJPO for its mission
* Manage the anonymous FTP node and authorize accounts as appropriate
* Prepare two year task plans, as initiatives are started, and keep them current
* Act as the Contracting Officer's Technical Representative (COTR)
* Track progress and direct assigned efforts
* Integrate efforts into the consolidated Ada program plan
* Conduct in-progress reviews and assess status
* Review deliverables and ensure their technical integrity
* Prepare estimates and manage budgets
* Build synergistic Government/industry/academic teams
* Represent the AJPO in public meetings and forums
* Prepare status reports and other management documents

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)
* Skilled programmer who has the ability to master the Ada language
* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of the Internet and performance optimization tools
* Knowledge of PC and workstation capabilities and approved standard software packages that run

on them
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Ability to plan and control multiple projects being pursued concurrently
* Ability to build teams and keep staff focused toward objectives
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

ATIPP MANAGER
ADA JOINT PROGRAM OFFICE

GRADE: O3/O4 or GS13/14

JOB DESCRIPTION: The ATIPP Manager has management responsibility for the AJPO Ada Technology Insertion Partners Program (ATIPP) efforts. These efforts are aimed at increasing the commercial use of Ada by academic, industry, and other non-defense Government organizations.

JOB FUNCTIONS:

* Prepare Broad Area Announcements (BAA) for ATIPP projects
* Prepare solicitations and participate in source selections
* Prepare a five year strategic plan for the ATIPP area
* Prepare two year ATIPP task plans and keep them current
* Act as the Contracting Officer's Technical Representative (COTR)
* Track progress and direct on-going ATIPP efforts
* Integrate efforts into the consolidated Ada program plan
* Conduct ATIPP in-progress reviews and assess status
* Review ATIPP deliverables and ensure their technical integrity
* Prepare estimates and manage budgets
* Build synergistic Government/industry/academic teams
* Represent the AJPO in public meetings and forums
* Prepare status reports and other management documents

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)
* Skilled programmer who has the ability to master the Ada language
* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of software engineering principles and concepts
* Knowledge of modern programming practices and CASE environments
* Knowledge of modern management theory
* Knowledge of SEI Capability Maturity Model and its application
* Knowledge of program planning, budgeting and scheduling concepts

* Knowledge of DOD acquisition management policies and practices
* Ability to plan and control multiple projects being pursued concurrently
* Ability to understand where the risks are and what to do to address them
* Ability to build teams and keep staff focused toward objectives
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

MANAGEMENT ANALYST
ADA JOINT PROGRAM OFFICE

GRADE: O2/O3 or GS9/11

JOB DESCRIPTION: The Management Analyst supports the AJPO liaison officers. The Management Analyst will focus on supporting the Director of the AJPO in the areas of management review and reporting.

JOB FUNCTIONS:

* Develop management review and reporting procedures
* Review contracts and track their status
* Track contract deliverables and ensure their timely review
* Review actual versus planned and track variances
* Develop and status action item tracking system
* Manage AJPO financial obligations and track their implementation
* Prepare Weekly Activities Report (WAR) based on liaison officer input

SKILLS, KNOWLEDGE AND ABILITIES:

* Skilled communicator (both written and oral)
* Skilled manager who has the ability to manage multiple tasks in parallel
* Knowledge of office automation software and common productivity tools
* Knowledge of modern management theory
* Knowledge of general accounting principles
* Knowledge of program planning, budgeting and scheduling concepts
* Knowledge of DOD acquisition management policies and practices
* Knowledge of contracting procedures
* Ability to monitor scheduled activities from multiple projects
* Ability to track progress on multiple projects being pursued concurrently
* Ability to understand where the risks are and what to do to address them
* Ability to work in an environment that requires quick response
* Ability to work with a minimum of direction towards the common goal
* Ability to effectively deal with the public and news media

SECURITY CLEARANCE: Secret

AdaIC PROGRAM MANAGER

ADA JOINT PROGRAM OFFICE

GRADE: Contractor

JOB DESCRIPTION: The AdaIC Program Manager manages the Ada Information Clearinghouse efforts for the AJPO. This key individual manages the team that supports the AJPO by managing its information resources which include Ada databases, a library, and history files. The AdaIC also provides vital information to prospective clients through their Internet host, bulletin boards, newsletters and brochures, and exhibit/trade show support.

JOB FUNCTIONS:

* Prepare a five year strategic plan for the AdaIC
* Prepare two year AdaIC task plans and keep them current
* Maintain the AdaIC databases: Ada products and tools; Ada usage; Validated Ada Compilers; Ada abstracts; Catalog of Resources for Education in Ada Software Engineering (CREASE); etc.
* Prepare, edit, and distribute the quarterly AdaIC newsletter
* Maintain the AdaIC hotline, answer inquiries and provide information that is requested by interested parties from academia, Government and industry
* Exhibit at trade shows and conferences (provide an Ada presence)
* Maintain AJPO computational resources and coordinate repairs as needed
* Track compiler validation efforts and publish a validated compiler list
* Gather information as needed to keep AdaIC databases up-to-date
* Track progress and report status of on-going AdaIC efforts
* Integrate efforts into the consolidated Ada program plan
* Work as an integral part of the Government/industry/academic teams
* Support the AJPO in public meetings and forums

SECURITY CLEARANCE: Secret

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Appendix G
Liaison Committee Descriptions

This appendix contains Liaison and Steering Committee Descriptions for stakeholders within the Ada community. The following committees are described:

AJPO/SIGAda Academic Liaison Committee
AJPO/NSIA Industrial Liaison Committee
DOD Dual-Use Steering Committee

AJPO/SIGADA ACADEMIC LIAISON COMMITTEE

PURPOSE: The AJPO/SIGAda Academic Liaison Committee provides the Director of the AJPO with advice on how to increase the use of Ada as the preferred programming language in high schools, colleges, and universities. The committee will be organized by SIGAda.

COMMITTEE FUNCTIONS:

* Meet at least two times a year to discuss needs of stakeholders
* Discuss content and timing of initiatives that satisfy these needs
* Identify barriers to Ada adoption and ways to break them down
* Define requirements that the AJPO needs to satisfy
* Rank and rate alternative initiatives that the AJPO can undertake to increase the use of Ada in selected stakeholder areas
* Identify opportunities and how the AJPO can take advantage of them

MEMBERS: SIGAda will identify members.

AJPO/NSIA INDUSTRIAL LIAISON COMMITTEE

PURPOSE: The AJPO/NSIA Industrial Liaison Committee provides the Director of the AJPO with advice on how to increase the use of Ada in both the military and commercial sectors. The focus of this group will be placed on requirements as the AJPO initiates its partner programs. The committee will be organized by the NSIA, in conjunction with the AJPO. Members will be chosen by the NSIA in the widest possible manner.

COMMITTEE FUNCTIONS:

* Meet at least two times a year to discuss needs of stakeholders
* Discuss content and timing of initiatives that satisfy these needs
* Identify barriers to Ada adoption and ways to break them down
* Define requirements that the AJPO needs to satisfy
* Rank and rate alternative initiatives that the AJPO can undertake to increase the use of Ada in selected stakeholder areas
* Identify opportunities that occur and how the AJPO can take advantage of them

MEMBERS: NSIA will identify members.

DOD DUAL-USE STEERING COMMITTEE

PURPOSE: The DOD Dual-Use Steering Committee provides the Director of the AJPO with guidance and advice on the Ada Initiative. They monitor the AJPO's progress and discuss the impacts on their organizations. This is an ad hoc Committee composed of senior Government executives who provide the AJPO Director with insights that make his/her program more responsive to the needs of the Department.

COMMITTEE FUNCTIONS:

* Meet at least two times a year to discuss needs of stakeholders
* Discuss content and timing of initiatives that satisfy these needs
* Identify barriers to Ada adoption and ways to break them down
* Define requirements that the AJPO needs to satisfy
* Rank and rate alternative initiatives that the AJPO can undertake to increase the use of Ada in selected stakeholder areas
* Identify opportunities that occur and how the AJPO can take advantage of them

CHAIR: The DOD Dual-Use Steering Committee will be chaired by the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (C3I) or his designee.

Appendix H
Resource Summary

Appendix H, Resource Summary, contains Government-sensitive funding information. Its distribution is restricted to Government agencies and organizations. A copy of this appendix can be obtained by approved Government offices through the Ada Joint Program Office.